DIRECTION

No. : 54/2023. Date :- 11 /10/2023

Subject : Examinations leading to the Degree of Master of Science (M.Sc.) Two years – Four Semester Post Graduate Degree Course) under Choice Based Credit System Direction, 2023.

Whereas, the Ordinance No. 4/2008, the Direction No. 26/2010, dated 24/06/2010, 27/2010 dated 24/06/2010 and 78/2022 dated 06/10/2022 with respect to an examination leading to the Degree of Master of Science(M.Sc.) (Two years – Four Semester Post Graduate Degree Course) are in existence in the University,

AND

Whereas, the Direction Nos. 39/2011 dated 23/08/2011 and 25/2012 dated 29/06/2012 issued for giving corrigendum to original Direction No. 26/2010 are in existence in the University,

AND

Whereas, Maharashtra Public Universities Act, 2016 under section 33(c) provides for Choice Based Credit System for all certificates, diplomas, Degrees, post-graduate programmes and other academic distinctions,

AND

Whereas, Maharashtra Public Universities Act, 2016 under section 33(v) for states that the Academic Council has to create policy, procedure and practice for Choice Based Credit System for all Academic programmes,

AND

Whereas, Maharashtra Public Universities Act, 2016 under section 33(y) provides the research projects are an integral part of Choice Based modules for post-graduate programmes,

AND

Whereas, while considering item No.32 of Academic Council dated 15/11/2018, Dr. A.B. Marathe, member of Academic Council proposed to implement Choice Based Credit System for first year from Academic Session 2018-2019 and progressively up to final year,

AND

Whereas, while considering the proposal of Dr. A.B. Marathe, the Academic council has constituted a Committee No 01/2018,

AND

Whereas, while considering the recommendations of Committee No 01/2018, Academic Council in its meeting dated 13/01/2020 vide Item No. 17 has constituted a Committee No. 02/2020 under the Chairmanship of Pro Vice-Chancellor,

AND

Whereas, the recommendations of Committee No.02/2020 has been placed before the meeting of Academic Council dated 04/12/2020 vide Item No.72,

AND

Whereas, while considering the recommendations of the committee No.02/2020 vide Item No.72 along with Scheme of Choice Based Credit System, Academic Council resolved to implement Choice Based Credit System from Academic Year 2021-2022,

AND

Whereas, it was necessary to frame the draft provisions of Direction/Ordinance for Choice Based Credit System, matter is placed before the Committee No.02/2020 and for this Committee No.02/2020 has constituted faculty wise Sub Committees under the Chairmanship of respective Dean of the Faculty,

AND

Whereas, the Academic Council in its meeting dated 13/10/2021 vide Item No.12 has accepted & resolved to implement the Choice Based Credit System from the Academic Session 2022-2023,

AND

Whereas, the recommendations of the Faculty wise sub committees were placed before the Committee No.02/2020 in first online meeting dated 24/01/2022 following the series of meetings dated 02/02/2022, 03/02/2022, 08/02/2022, 10/02/2022 and 12/02/2022,

AND

Whereas, the recommendations of Committee No.02/2020 pertaining to the programmes of **Science group,** were placed before the meeting of the Faculty of Science and Technology in its meeting dated 19/03/2022,

AND

Whereas, the recommendations of the Faculty of Science and Technology were placed before the meeting of Academic Council dated 04/05/2022,

AND

Whereas, the Academic Council while considering the recommendations of the Faculty of Science and Technology, approved the Scheme of Teaching, Learning, examination and evaluation along with Draft Provisions of Direction/Ordinance,

AND

Whereas, the respective Board of Studies under the Faculty of Science and Technology in its meeting dated 03/6/2022 and 04/06/2022 framed Draft syllabi by taking into consideration the Scheme of Teaching, Learning, examination and evaluation along with Draft Provisions of Direction/Ordinance of Choice Based Credit System,

AND

Whereas, the Draft syllabi framed by the various Board of Studies under the Faculty of Science and Technology were placed before the online emergent meeting of Faculty of Science and Technology dated 28/07/2022,

AND

Whereas, the minutes of meeting of the Faculty of Science and Technology in its online emergent meeting dated 28/07/2022along with draft syllabus were approved by Hon'ble Vice-Chancellor under section 12(7) of Maharashtra Public Universities Act, 2016 on behalf of Academic Council,

AND

Whereas, the Direction No. 78/2022 dated 06/10/2022 which was issued under sub section (8) of Section 12 of Maharashtra Public Universities Act, 2016 for this curriculum has to be converted into Statute, Ordinance or Regulations as the case may be within 06 months as per the proviso of said section, failing which such Direction shall automatically lapsed,

AND

Whereas, making an Ordinance/Regulation is a time consuming process.

Now, therefore I, Dr. Pramod G.Yeole, In-charge Vice-Chancellor, Sant Gadge Baba Amravati University, Amravati in exercise of powers conferred upon me under Sub-section (8) of Section 12 of the Maharashtra Public Universities Act, 2016 do hereby direct as under-

1. (i)This Direction may be called**,** "Examinations leading to the Degree of Master of Science (M.Sc.) (Two years – Four Semester Post Graduate Degree Course) under Choice Based Credit System Direction, 2023".
   (ii) The Degree of Master of Science (M.Sc.) shall belong to the Faculty of Science and Technology.

2. This Direction shall come into force from the Academic Session as follows
   i) Semester I and II – from the Academic Session 2022-2023.
   ii) Semester III and IV – from the Academic Session 2023-2024.

3. The Common and Specific provisions of Direction are as follows and Scheme of Teaching, Learning, Examination and Evaluation of semester – I to IV is appended herewith vide Annexure – A1 to A4.

Common Provisions

4. In this Direction unless context otherwise requires –

Definition:

Choice Based Credit System (CBCS):-Choice Based Credit System means the curricular system that offers multiple interdisciplinary choices for students to select from the courses (core elective or minor or soft skill coursers) to accumulate credits;

Any other word and expression used herein and not defined but defined in *pari materia* such as the Maharashtra Public Universities Act, 2016, Directions and UGC regulations shall have the same meaning as assigned to them in the said enactments.

The duration of the programme under this Ordinance/Direction shall be of two academic years consisting of two semesters in each year.

5. As per the scheme of teaching, learning, examination and evaluation, theory/practical examinations of Semester-I, II, III & IV shall be conducted by the University (except OEC) at the end of each semester.

The theory/practical examinations of all the Semesters shall be held as per the following schedule:-

Table 1

Sr. No.	Name of the Examination	Main Examination	Supplementary Examination
1	Semester-I & III	Winter	Summer
2	Semester-II& IV	Summer	Winter

6. The practical examinations of all semesters (Semester -I, II, III & IV) under this ordinance wherever applicable shall be conducted by the University by appointing an external and internal examiners. Practical examination of all the Add-on courses of all semesters will be conducted by the College/Institute/University Department only.
7. The duration of each semester shall be as prescribed in the Academic Calendar.
8. The examinations specified in clause 32 shall be held twice in a year at such places and on such dates as may be prescribed by the University.
9. An applicant to an examination specified in clause 32 shall pursue a regular course of study in courses prescribed for the examination concerned for not less than one semester in a particular semester in a university department or College/Institute affiliated to the University.

   Provided that the student shall be eligible to appear for examination if
   a. he/she satisfies the conditions in the table and the provisions there under.
   b. he/she complies with the provisions of the Ordinance pertaining to the Examination in general from time to time.
   c. he/she has pursued a regular course of study in a University Department or College affiliated to the University.
   d. he/she has in the opinion of the H.O.D. or Principal shown satisfactory progress in his/her studies.
10. The Provisions of Ordinance No.6 shall be applicable in *mutatis-mutandis* to every collegiate/non-collegiate student.
11. The fees for each theory and practical examination conducted by the university shall be as prescribed by the University, from time to time.
12. **Skills Enhancement Course (SEC)**

    Semester-III OR IV

    In Semester III or IV, there shall be compulsory Skill Paper based on the concerned subject where students are expected to learn skills to be employable or become entrepreneur after PG Programme.

13. **Research/Innovative Project/Dissertation**

Semester III and/ or IV

Every student shall be offered Research/Innovative Project in III and/or IV Semester. This research/Innovative Project/Dissertation will carry 100 Marks and of maximum 5 credits per semester. The project/dissertation must be submitted in the hardbound copy to the University Department/College/Institute. For internal evaluation, the students shall have to give a presentation of the project/dissertation in a given Semester. Further, for external examination, Project/Dissertation shall be evaluated by the concerned teacher/supervisor/guide in the University Department/College / Institute as an Internal Examiner along with an External Examiner appointed by the University.

14. **Ability Enhancement Course (AEC) :** Discipline Specific Ability Enhancement Course shall be offered in Semester I and Semester II to the students as Theory/Tutorial of One Hour per week duration Students will earn 1 Credit each for the same.

15.**Ancillary Credit Courses :- (University Department/College Level)**

(A) Internship/Apprenticeship/ Field Work/ Work Experience :- (During Vacations of semester- I to III)

There shall be Internship/Apprenticeship/ Field Work/ Work Experience for duration of minimum 60 hrs. to maximum 90 hours available to all the students, to be completed during vacations of Semester-I to III.

This will carry 2 Credits for learning of 60 hours. It should be evaluated by mentor teacher / faculty member with the help of Work Report certified by trainer where Internship/Apprenticeship/ Field Work/ Work Experience is undertaken and as submitted by students. It shall be completed in vacation only. Students may opt for any one of these categories. The Credits of Internship/Apprenticeship/ Field Work/ Work Experience shall be reflected in the Credit Grade Report of the fourth Semester. The grade and credits obtained by the students should be communicated to the University by the College/Institution/University Department before the start of the IV semester examination.

I) **Internship/ Apprenticeship :** Students should undertakeInternship/ Apprenticeship of minimum 60 hours in the organizations including but not limited to Academic Institutes of National Importance or Research Laboratories or Institutes or Industries or companies or firms or businesses as identified by the College/ Institute/University Department. The participation shall be duly certified by the Internship / Apprenticeship provider. It is to be verified by the Principal/Director/HOD/Mentor teacher / faculty member of the College/Institute/University Department.

II) **Field Work:** Students can undertake fieldwork for duration of minimum 60 hours related to their Programme in a broad sense. This fieldwork shall be identified by the College/Institute/University Department and to be certified by the field work organiser and verified by Principal/Director/HOD/Mentor teacher/ faculty member of the College/Institute/ University Department.

III) **Work Experience:** Students can undertake *work experience* for duration of minimum 60 hours. It includes students participating in the regular work of any Firm/Company/Industry/Organisation/ Institute/ Businesses/Local Body identified by the College/Institute/University Department. It should be related to their programme. The work experience should be certified by the provider and to be verified by Principal/Director/HOD/ the mentor / concerned teacher / faculty members of the College/Institute/University Department.

16.**Open Elective Course (OEC) :-** (Any time during Semester-I to IV)

There shall be an open elective course for the student during Semester I to IV. Students can select one or more of these courses. These courses shall be of intra- disciplinary as well as inter-disciplinary nature. Students can earn cumulatively maximum 5 Credits in this course.

OEC will include the following types of courses.

i)General Interest Course (GIC):- General Interest Courses shall be from different disciplines/programmes including IPR and the curriculum of these courses shall be as prescribed by the University. This course will be evaluated by the concerned teacher / faculty member at the College/Institute/University Department level and the Credit shall be communicated to the University before the start of IV semester examination. If the concerned subject teacher / faculty member/ mentor / guide is from the College/Institute/University Department other than the College / Institute / University Department, where the student has taken admission to pursue regular course of study, then the credit earned by the student should be submitted by the teacher / faculty member / mentor / guide through the principal/HOD of the Parent Institute/University Department. In such cases, the consent from the principal of Parent Institute/HOD and the concerned teacher/ faculty member / mentor / guide should be obtained by the student before commencement of the course. The student may opt any course of any other discipline /faculty of his/her interest as GICThe nature of these courses shall be self study under the guidance of the concerned teacher mentor (faculty member).

ii) Skill Course:-The students will be offered *Skill Courses*. The courses shall be designed by respective Boards of Studies or by concerned Sector Skill Council / National Skill Development Councils (NSDC).The Skill courses may be designed by the Colleges / Institutes/University Department and after approval of the University, it shall be offered to the students. This course will be evaluated by the concerned teacher / faculty member/mentor at the College/Institute/University Department level and the Credit shall be communicated to the University before the start of IV Semester examination. For the skill courses opted from Sector Skill Council (SSC) or NSDC, the evaluation may be done by the respective council and the credit shall be communicated to the University before the start of IV Semester examination.

iii) **MOOC :-**The students may opt MOOC courses identified by the teacher/mentor/faculty member and maximum *5 credits* may be earned by the students after successful completion of these MOOC courses with a minimum 75 hours of course on different online training platforms approved by the university. The concerned teacher / faculty member shall act as a facilitator and based on the students' performance in the course, the facilitator shall award Credits in accordance with the Marks/Grades given by relevant MOOC provider. After mapping with University grading system, the College/Institution/University Department shall communicate Marks/Grades to the university before the start of IV Semester examination. College/Institute/University Department can also develop MOOC related to their concerned subject and after the approval of the University, these courses may be offered to the students These courses shall be of Intra- disciplinary as well as Inter disciplinary nature.

iv) **Extra-curricular and co-curricular activities :-** (In all semesters)
The students may earn maximum cumulative 5 credits from the activities as given in Table No.2 & 3 after securing rank or participation at College / University /State/ Zone/ National / International level events. These credits shall be earned in option to Open Elective Course (OEC), so that these performers shall be given relaxation from undertaking this course. These credits can be earned during the entire degree programme period but before the start of IV Semester examination. These credits will be reflected in the final semester Credit Grade Report. The mentor/ concerned teacher/faculty member shall award the Credits to the student based on his/her performance as given in Table No. 2 and 3 . Further, College / Institution /University Department shall communicate these to the University

Table No. 2

Comprehensive Credit Distribution

S. N.	Activities	Credits at Levels							
		College	Univer-sity	State	Zone if exist	National	International, if exist	Credit Point	inimum Passing Grade
1	Unnat Bharat Abhiyan[UBA]	1	2	3	4	5	6	4	P
2	Sports activities (see table no. 3)	1	1 / 2	2 / 3	3 / 4	4 / 5	5 / 6	4	P
3	Cultural activities	1	2	3	4	5	6	4	P
4	Academic activities like review paper presentations, Aavishkar, start-up, Hackathon, Quiz competitions, other curricular, co-curricular activities, students exchange programme etc.	1	2	3	4	5	6	**4**	**P**
	Research Paper published/presented	--	1	2	-	4	6	**4**	**P**
5	**Participation in Summer school/ Winter School / Short term course** (not less than 30 hours 1 or 2 weeks duration)	2 Credits						**4**	**P**
	(not less than 60 hours 2 or 3 weeks duration)	4 Credits						**4**	**P**
	Scientific Surveys, Societal Surveys	2 Credits						**4**	**P**
	Field Visits, Study tours, Industrial Visits,	1 Credit						**4**	**P**

Table No. 3
Credit Distribution for Sports

Sr. No.	Particulars of Sports Status (Individual/ Team)	Credits	Credit Point	Minimum Passing Grade
1	College Level Participation	1	4	P
2	University Level Participation	1	4	P
3	University Level Rank 1, 2, 3	2	4	P
4	State Level Participation	2	4	P
5	State Level Rank 1, 2, 3	3	4	P
6	Zonal Level Participation	3	4	P
7	Zonal Level Rank 1, 2, 3	4	4	P
8	National Level Participation	4	4	P
9	National Level Rank 1, 2, 3	5	4	p
10	International Level Participation	5	4	P
11	International Level 1,2,3	6	4	P

17. In the Scheme of Teaching, learning, Evaluation & Examination, credits. Maximum marks, minimum passing marks, minimum passing grade are given for Semester Examination in each Course for the theory and the practical of each of the four examinations. Also Computation of SGPA and CGPA, letter grades and grade point, equivalence of class/ division to corresponding CGPA shall be indicated as given in Appendix B.
The computation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) of an examinee of *post graduate course* shall be as given in Appendix B.

18. Provisions of Ordinance No.18/2001 to provide grace marks for passing in Heads of passing and Improvement of Division (Higher Class) and getting Distinction in the Course and condonation of deficiency of marks in a Course shall apply to the examination under this Direction.

19. An unsuccessful examinee at any of the above examination shall carry College/Institute/University Department assessment marks (Sessional Marks) of the Theory/Practical examination to the successive attempt at the examination.

20. As per Maharashtra Public Universities Act, 2016, Section 89 Chapter VIII, the results of every examination and evaluation conducted by the University will be declared within thirty days from the last date of examination for that particular course and in any case declare the results latest within forty five days. The names of the examinees passing the examination as a whole in the minimum prescribed period and obtaining the prescribed number of places in the CGPA shall be arranged in order of merit as provided in the examination in general Ordinance No.6 provided that the merit list only be published in summer examination.

21. Subject to provisions in other ordinances and directions , no person shall be admitted to an examination under this Direction/Ordinance, if he / she has already passed the same examination of this university or an equivalent examination of any other University.

22. An examinee who completed the term satisfactorily but fails to present himself/herself for the examination shall be eligible for readmission to the same examination, on payment of fresh fees and other fees as may be prescribed by the university from time to time.

23. A Student who could not complete a semester satisfactorily or did not keep term will be eligible for readmission to the same semester. However, readmission to the semester should be allowed only in regular session of that semester. In such case, the candidate will not be eligible to get admission in higher semester.

24. A candidate/student who has successfully completed all requisite courses approved by the University an earned minimum prescribed total credits for which he/she is admitted for the under graduate degree programme and accumulated the required credits for the program and who has put in the minimum residence time prescribed for each semester of the program shall be eligible to receive the degree.

25. Examinations will be conducted in Offline mode in accordance with Ordinance No.9. However, under special circumstances and in specific cases, those can be conducted in Online mode on the recommendations of Board of Examination & Evaluation and approval by the Academic Council.

26. Generally and preferably College / Institute/ University Department internal assessment examinations & University examinations papers should be set from the Question Bank prepared by the University.

27. The College/Institute/University Department shall maintain a complete record of marks obtained by the every Student in the Practical, Induction Program, Open Elective course, Internship/ Apprenticeship /Field Work/Work experience, Extra-curricular & Co-curricular activities etc. as applicable and should be sent to the University in prescribed format according to schedule given by the University.

Equivalence of Class/Division to Corresponding C.G.P.A.

Sr. No.	C.G.P.A.	Class/Division
1	7.5 or more than 7.5	First Class with Distinction
2	6.00 or more but less than or equal to 7.49	First Class
3	5.50 or more but less than or equal to 5.99	Higher Second Class
4	5.00 or more but less than or equal to 5.49	Second Class
5	4.00 or more but less than or equal to 4.99	Pass

28. **Power to modify and remove difficulties :-**

a) Notwithstanding anything contained in the foregoing, Hon'ble Vice-Chancellor in consultation with the Dean of the faculty shall have the power to issue directions or orders to remove any difficulty,

b) Nothing in the foregoing may be construed as limiting the power of the University to amend modify or repeal any all of the above.

29. **CBCS Working Committee :-**

A) **University Level** :-

There shall be a CBCS working committee in the University comprising of the following members

1. Vice-Chancellor - Chairman
2. Pro-Vice Chancellor - Member
3. Deans of all faculties - Members
4. Concerned Head of the Department - Member
5. Deputy Registrar (Academic) - Member-secretary

B) College Level

There shall be a CBCS working committee in each affiliated college comprising of the following members

1. Principal - Chairman
2. HODs of Teaching Departments of a College - Members
3. IQAC Co-ordinator - Member- secretary

University Department Level :-

There shall be a CBCS working committee in each university department comprising of the following members

1. Head of the University Department - Chairman
2. One Teacher nominated by Honourable Vice-Chancellor - Member

Powers and Duties of the CBCS Working Committee :-

1. Committee shall take review of the Implementation of the CBCS after completion of every Semester
2. The committee shall report to the University about difficulties faced during the implementation of the CBCS to the University.
3. The committee should also consider the grievances of the students regarding the difficulties/disadvantages put to them if any during their studies under CBCS.
4. For college level and University level, the committee will also be a grievance redressal committee for implementation of CBCS, respectively.
5. The committee may consider any other matter in the interest of the students as far as the CBCS is concerned.

Appendix -A

Table-A Ancillary Credit courses

Sr. No	Course/Programs	Nature	Sem-ester	Organised by	Teaching Learning Training Period (Hours)	Evaluation Authority	Performa-nce Evaluation Mode	Min. Pass-ing Grade/Rank	Exam or No-exam	Credit/s Earned
1	**Internship / Apprenticeship /Field work/ Work Experience**	Man-datory	**During Vacation of** I to III	Organi-sation/ Industry/ College/ Institute/University Departme nt	Minimu m 60 to maxim um 90	Organi-sation/ Industry/ College/ Institute/ University Department	Score-sheet of Performa-nce		**Non-exam**	Minimum2 maximum 3
2	**Open Elective Course GIC/Skill/ MOOC**	optional	I to IV	Online/Offl ine Mode/SW AYAM/S SC/NSDC /college/in stitute	75	SWAYAM/ NPTEL/ College/ Institute/ SSC/NS DC	Certification fromconcerne d Authority	P	**Exam or Non Exam**	5
3	**Co-curricular / Extracurricular Activities**	optional	I to IV	As per Table 2 & 3	Adequate as per activity	Organised as per level of activity	As per para 13 (iv) Table 2 & 3	Not applicab le	**Non-exam**	5

Note :- 1) Minimum 03 (Serial No.1 mandatory) credits of the programme are mandatory to be earned by all the students from Ancillary Credit Courses as mentioned in Table A.

2) Record of student's Performance cum Evaluation (containing attendance, concept knowledge, intellectual/ decision making ability, handling skill, sense of responsibility, cooperative/leadership quality, presentation/demonstration) related to Internship /Apprenticeship/Field work/Work Experience shall be maintained by the College/Institute/University Department.

3) For allotment of Internship /Apprenticeship/Field Work/Work Experience, the College/ Institute/University Department shall follow standard operating procedures (SOP) with concerned College/Institute/University Department/Organisation/ Industry on the basis of Memorandum Of Understanding (MOU) /Letter of Intent and Joining letter. Further, for validation, progress records, Evaluation Sheet etc. shall be maintained by the College/Institute/University Department.

4) College/ Institute/university Department shall submit credit report for ancillary Credit Courses as per Table A to the University.

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Appendix B

COMPUTATION OF SGPA AND CGPA AND AWARD OF DEGREE

1) Marks of each paper/subject shall be converted into grades as given in the table No. 4

Grades and Grade Points

TABLE – 4

Grade	Description	Range of Marks obtained out of 100 or equivalent fraction	Grade point
O	Outstanding	90-100	10
A+	Excellent	80-89	9
A	Very Good	70-79	8
B+	Good	60-69	7
B	Above average	55-59	6
C	Average	50-54	5
P	Pass	40-49	4
F	Fail	Below 40	0
Ab	Absent	Ab	0

A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

2) Based on the grade points obtained in each Subject/Paper Semester Grade Point Average (SGPA) and then Cumulative Grade Point Average (CGPA) are computed as follows :

There shall be two SGPA & CGPA i.e. SGPA & CGPA computed on the basis of science subject i.e. DSC & DSE offered by candidate and another by SGPA & CGPA computed on the basis of all the subjects offered by the candidate.

i) Computation of SGPA:

Semester Grade Point Average (SGPA) is the weight age average of point obtained by a student in a semester and computed as follows.

$$\text{SGPA (Si)} = \sum Ci \; x \; Gi \; / \sum Ci$$

Where C_i denotes the number of credits of the i^{th} course and $G_i$denotes the grade points scored by a student in the i^{th} course.

ii) Computation of CGPA :

The CGPA is computed as follows

$$\text{CGPA} = \sum (Ci \; x \; Si) \; / \sum Ci$$

Where S_i denotes the SGPA of the i^{th} Semester and C_i denotes the total number of credits in that Semester. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

3) Equivalence of the conventional division/class to the corresponding C.G.P.A. in final semester is in accordance with the following table

Equivalence of Class/Division to C.G.P.A.

Sr. No.	C.G.P.A.	Class/Division
1.	7.5 or more than 7.5	First Class with Distinction
2.	6.00 or more but less than or equal to 7.49	First Class
3.	5.50 or more but less than or equal to 5.99	Higher Second Class
4.	5.00 or more but less than or equal to 5.49	Second Class
5.	4.00 or more but less than or equal to 4.99	Pass

Appendix C

GUIDELINES TO PAPER SETTERS

1. Medium of Instructions and examination shall be as prescribed by the respective BOS.
2. For the internal assessment & University end semester theory examinations, the paper should be set preferably from the question bank prepared by the university.

The question should be based on bloom's Taxonomy levels of (a) Remembering (b) Understanding (c) Application (d) Analysis.

Remember: -

Skill Demonstrated	Question Ques / Verbs for tests
• 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, describe, state, recite, recall, identify, show, label, tabulate, quote, name, who, when where, etc.

Understand: -

Skill Demonstrated	Question Ques / Verbs for test
• 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.

Apply: -

Skill Demonstrated	Question Ques / Verbs for test
•• Use information • use methods, concepts, laws, theories in new • situations solve problems using required skills of knowledge Demonstrating correct usage of method or procedure	Calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify.

Analysis: -

Skill Demonstrated	Question Ques / Verbs for test
• break down a complex problem into parts. • Identify the relationships and interaction between the different parts of complex problem.	Classify, outline, break down, categorize, analyse, diagram, illustrate, infer, select.

Evaluation (Judging)

Skill Demonstrated	Question Ques / Verbs for test
Evaluation questions encourage students to develop opinions and make value decisions about issues based on specific criteria	. Assess, Critique, Determine, Evaluate, Judge, Justify, Measure & Recommend **Examples of questions:** • "How could you select...?" • "How could you prove...?" • "How would you prioritize...?" • "What information would you use to support...?"

Synthesis (Creating)

Skill Demonstrated	Question Ques / Verbs for test
These questions encourage students create something new by using a combination of ideas from different sources to form a new whole	Arrange, Combine, Create, Design, Develop Formulate, Integrate & Organize Examples of questions: "What could be changed to improve...?" "How would you test...?" "What way would you design...?" "What outcome would you predict for...?"

The Weightage of marks should be given preferably in the range of :

(a)	Remembering	10 to 20%
(b)	Understanding	30 to 45%
(c)	Application	30 to 45%
(d)	Analysis	10 to 20%
(e)	Evaluation (Judging)	10 to 15%
(f)	Synthesis (Creating)	10 to 15%
		100 to 160%

Types of Questions: -

a) Multiple Choice Question (M.C.Q.) as and when applicable: -

1. **Relevant content:** The question should be based on the relevant and important content.
2. **Application of knowledge, not only theory:** The question tests the application of knowledge, does not only test how the candidate recalls isolated theoretical facts.
3. **Focused questions and homogeneous answers:** The question focuses on one relevant aspect of the topic, all proposed answers belong to the same content dimension (i.e., diagnosis, or causes, or managements decisions etc.)
4. **Clear and unambiguous answer:** The best answer clearly stands out. Avoid "correct" answers with existing controversial doctrines.
5. **Appropriate level of difficulty (50% -90% correct answers):**
   Too difficult - even the best candidates need to guess
   Too easy - weak candidates get a "present"
6. **Unambiguous, concise and simple phrasing:** Avoid trick questions, double negatives.
   Use only common abbreviations, short sentences etc.

Avoid imprecise qualifications (often, usually etc

7. **Avoid clues:**

Clues can help candidates guess the correct answer. Examples are:

- One answer is much more detailed than the others
- Only one answer follows grammatically from the stem •Non logical order of the answers

General strategies

- **Test comprehension and critical thinking, not just recall**
  Ask MCQ so as to interpret facts, evaluate situations, explain cause and effect, make inferences, and predict results.
- **Use simple sentence structure and precise wording**
  Write test questions in a simple structure that is easy to understand. And try to be as accurate as possible in your word choices. Words can have many meanings depending on colloquial usage and context.
- **Use familiar language.**
  The question should use the same terminology that was used in the course. Avoid using unfamiliar expressions or foreign language terms, unless measuring knowledge of such language is one of the goals of the question. Students are likely to dismiss distracters with unfamiliar terms as incorrect.
- **Place most of the words in the question stem**
  While using a question stem, rather than an entire question, ensure that most of the words are in the stem. This way, the answer options can be short, making them less confusing and more legible.
- **Avoid giving verbal association clues from the stem in the key.**
  If the key uses words that are very similar to words found in the stem, students are more likely to pick it as the correct answer.
- **Avoid trick questions**
  Questions should be designed so that students who know the material can find the correct answer. Questions designed to lead students to an incorrect answer, through misleading phrasing or by emphasizing an otherwise unimportant detail of the solution, violate this principle.
- **Avoid negative wording**
  Students often fail to observe negative wording and it can confuse them. As a result, students who are familiar with the material often make mistakes on negatively worded questions. In general, avoid having any negatives in the stem or the options. In the rare cases where you use negatives be sure to emphasize the key words by putting them in upper case, and bolding or underlining them.
- **Avoid double negatives**
  Don't use combinations of the words like not, no, nor, the -un prefix, etc. in the same question.
- **Make the choices grammatically consistent with the stem.**
  Read the stem and each of the choices aloud to make sure that they are grammatically correct.
- **As far as possible, keep all answer choices of the same length.**
  This can be difficult to achieve, but expert test-takers can use answer length as a hint to the correct answer. Often the longest answer is the correct one. When one can't get all four answers to the same length, two short and two long can be used.
- **Place the choices in some meaningful order.**
  When possible, place the choices in numerical, chronological or conceptual order. A better structured question is easier to read and respond.
- **Randomly distribute the correct response.**
- The exam should have roughly the same number of correct answers that are a's, b's, c's and d's (assuming there are four choices per question)

- **Avoid using "all of the above"**
  If "all of the above " is an option and students know two of the options are correct, the answer must be "all of the above". If they know one is incorrect, the answer must not be "all of the above". A student may also read the first option, determine that it is correct, and be misled into choosing it without reading all of the options.
- **Avoid using "none of the above"**
  The option "none of the above" does not test whether the student knows the correct answer, but only that he/she knows the distracters aren't correct.
- **Refrain from using words such as always, never, all, or none.**
  Most students know that few things are universally true or false, so distracters with these words in them can often be easily dismissed.
- **Avoid overlapping choices**
  Make the alternatives mutually exclusive. It should never be the case that if one of the distracters is true, another distractor must be true as well.
- **Avoid questions of the form "Which of the following statements is correct?"**
  There is no clear question being asked, and the choices are often heterogeneous. Such questions are better presented in the form of True/ False questions.
- **Instruct students to select the "best answer" rather than the "correct answer"**
  By doing this, you acknowledge the fact that the distracters may have an element of truth to them and discourage arguments from students who may argue that their answer is correct as well.

Designing stems

- **Express the full problem in the stem.**

When creating the item, ask yourself if the students would be able to answer the question without looking at the options. This makes the purpose of the question clear.

- **Put all relevant material in the stem.**
  Do not repeat in each of the alternatives information that can be included in the stem. This makes options easier to read and understand, and makes it easier for students to answer the question quickly.
- **Eliminate excessive wording and irrelevant information from the stem.**
  Irrelevant information in the stem confuses students and leads them to waste time.

Designing alternatives

- **Limit the number of alternatives.**
  Use between three and five alternatives per question. Research shows that three choice items are about as effective as four or five-choice items, mainly because it is difficult to come up with plausible distracters.
- **Make sure there is only one best answer.**
  Avoid having two or more options that are correct, but where one is "more" correct than the others. The distracters should be incorrect answers to the question posed in the stem.
  Make the distracters appealing and plausible.
  All of the wrong answer choices should be completely reasonable. If the distracters are farfetched, students will too easily locate the correct answer, even if they have little knowledge. When testing for recognition of key terms and ideas keep the distractors similar in length and type of language as the correct solution. When testing conceptual understanding, distractors should represent common mistakes made by students.

b) **Short Answer (SA) descriptive ……marks as applicable)**

A short answer question as the term indicate is one to which a brief answer can be given. When the students are required to give a brief and precisely defined response, the suitable type is the restricted response questions. The specific form of the answer should also be indicated, e.g., List, Define, Give reason etc.

While framing a question requiring short answer it should be ensured that:

1. The statement constituting the question is simple, clear and unambiguous.
2. The scope of the answer is limited.
3. The direction given in the question is clear.
4. The question constitutes a valid testing situation for the ability under consideration
5. The question is likely to be interpreted in the same way by teachers/ students/ examiners.
6. The question does not require further restructuring.

c) Long Answers (LA) ……marks as applicable)

Long Answer (LA)

As the term indicates a long answer question is the one that needs a comprehensive explanation incorporating different ideas. The question should require the student to organise his ideas, choose the form of his answer and answer in his own words.

While framing a question requiring a long answer it should be ensured that:

1. The situation presented in the question is not new to most of the students.
2. The student will not be able to produce in the full, memorised answer.
3. The question involves the use of judgment on the part of student.
4. The answer can be completed within the limited time given.
5. The length and the scope of the answer is specified.

***

Appendix D

Instruction to the BOS

Curriculum / syllabus shall be modified/prepare for the courses/subjects prescribed as in CBCS direction.

The Programme Educational Objectives (PEOs), Program Outcomes (POs), Programme Specific Outcomes (PSOs) should be well defined.

For each course of the Program, learning objectives and learning outcomes: Course Outcomes (COs) should be defined carefully in accordance with Bloom's Taxonomy.

A comprehensive note on employability potential of the program should be added separately at the Preface/Preamble of the Program Curriculum

Bloom's hierarchy takes students through a process of synthesizing information that allows them to think critically. Students start with a piece of information and are motivated to ask questions and seek out answers.

Not only does Bloom's Taxonomy help teachers understand the process of learning, but it also provides more concrete guidance on how to create effective learning objectives.

Table 5 Bloom's Taxonomy

Bloom's Level	Key Verbs (keywords)	Example Learning Objective
Create	design, formulate, build, invent, create, compose, generate, derive, modify, develop.	*By the end of this lesson, the student will be able to design an original homework problem dealing with the principle of conservation of energy.*
Evaluate	choose, support, relate, determine, defend, judge, grade, compare, contrast, argue, justify, support, convince, select, evaluate.	By the end of this lesson, the student will be able to determine whether using conservation of energy or conservation of momentum would be more appropriate for solving a dynamics problem.
Analyze	classify, break down, categorize, analyze, diagram, illustrate, criticize, simplify, associate.	*By the end of this lesson, the student will be able to* differentiate between potential and kinetic energy.
Apply	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, perform, present.	*By the end of this lesson, the student will be able to* calculate the kinetic energy of a projectile.
Understand	describe, explain, paraphrase, restate, give original examples of, summarize, contrast, interpret, discuss.	*By the end of this lesson, the student will be able to* describe Newton's three laws of motion to in her/his own words
Remember	list, recite, outline, define, name, match, quote, recall, identify, label, recognize.	*By the end of this lesson, the student will be able to* recite Newton's three laws of motion.

This also reminds teachers that learning is an active process, stressing the importance of including measurable verbs in the objectives. And the clear structure of the taxonomy itself emphasizes the importance of keeping learning objectives clear and concise as opposed to vague and abstract.

OBE (Outcome Based Education) starts with a clear statement on what Knowledge, Skills and Attitudes, the Student will be able to demonstrate as having acquired on successful completion of a program of study. These should be clearly measurable.

Program Educational Objectives (PEOs):

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

GRADUATE ATTRIBUTES

Knowledge :Graduates have comprehensive knowledge and understanding of their subject area, the ability to engage with different traditions of thought, and the ability to apply their knowledge in practice including in multi-disciplinary or multi-professional contexts.

Critical and Analytical Thinking :Graduates are effective problems-solvers, able to apply critical, creative and evidence-based thinking to conceive innovative responses to future challenges.

Communication : Graduates convey ideas and information effectively to a range of audiences for a variety of purposes and contribute in a positive and collaborative manner to achieving common goals.

Team Work, Leadership : Graduates engage in professional behaviour and have the potential to be entrepreneurial and take leadership roles in their chosen occupations or careers and communities.

Ethics : Graduates are responsible and effective global citizens whose personal values and practices are consistent with their roles as responsible members of society.

Digital Competencies :Graduates are well prepared for living, learning and working in a digital society.

Enquiry and Lifelong Learning: Graduates of the University will have developed a core knowledge base in their academic field enhanced by exposure to cutting edge research and the processes of discovery and knowledge generation. This will stimulate a lifelong thirst for knowledge and learning and encourage a pioneering, innovative and independent attitude.

Aspiration and Personal Development: Graduates of the University will be able to maximize their potential by utilizing their abilities, academic excellence and justifiable confidence, underpinned by honest self-awareness, to take personal responsibility and grasp opportunities for self-development.

Outlook and Engagement: Graduates of the University will possess an international perspective and will draw on the quality and breadth of their University experience to engage effectively with the environments in which they operate – whether that be education, work or society.

Program Outcomes (POs):
Program outcomes: Describe what students are expected to know and would be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program.
Program outcomes basically describe knowledge, skills and behaviour of students as they progress through the program as well as by the time of graduation and must reflect all GAs (Graduate Attributes).

Program Specific Outcomes (PSOs):
Program Specific Outcomes are statements that describe what the graduates of a specific engineering program should be able to do.

Course Outcomes (COs):
Statements indicating what a student can do after the successful completion of a course. Every Course leads to some Course Outcomes. The CO statements are defined by considering the course content covered in each module of a course. For every course there may be 5 or 6 COs. The keywords used to define COs are based on Bloom's Taxonomy.
Typically 4-6 CO s should be identified /Course. COs are major domain specific outcomes written using action verbs which are specific, measurable and can be demonstrated by students on completion of the course. Course Outcomes should aim to develop higher order skills in each Domain of Learning. Evaluation, Synthesis, Analysis are typical examples in Cognitive Domain. Outcomes which can be mastered in a significantly lower no. of lessons are likely to be too trivial and more suitable for Unit or Module Outcomes. Attainment of each CO should lead to attainment of one or more PO s.
For the internal assessment & University end semester theory examinations, the paper should be set preferably from question bank. Hence question bank should be prepared.
Also Board of Studies shall prepare a question bank of MCQs from units of all subjects.
Curriculum/syllabus of concerned Generic Open Elective Courses (GOECs), General Interest Courses (GICs), skill courses and Modules shall be prepared by the respective BOS as prescribed in CBCS scheme.

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APPENDIX - E

Glossary of Terms

A. Academic Year : Academic year means academic activities of the University in a year (odd Semester followed by even semester) as notified in the Academic Calendar.

B. **Semester :** It is a period of study comprising of 15 to 18 weeks of academic work equivalent to normally 90 teaching days. The odd Semester may be scheduled from July to December and even semester from January to June.

C. **Programme / Programme of study** : Programme / Programme of study means a higher education programme pursued for a degree specified by the UGC under Section 22 (3) of the UGC Act;

D. Course/Subject/Paper :-Course means one of the specified units which go to comprise a programme of study. It is referred to, as a 'paper' or 'subject' which is a component of a programme. All courses need not carry the same weight. A course may include but may not be limited to lectures / tutorials / laboratory work / field work /internship/ outreach activities / project work / vocational training / viva / seminars / term papers / assignments / presentations / dissertation/self-study etc. or a combination of these. Courses in a programme may include Core, Elective and Foundation.

i) **Ability Enhancement Courses (AEC):-**The Ability Enhancement Courses may be of two kinds: Ability Enhancement Compulsory Courses (AECC) and Skill Enhancement Courses (SEC). "AECC" courses are the courses based upon the content that leads to Knowledge enhancement. "SEC" courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

a. Communication Skills : Abilities used when giving and receiving different kinds of information. It involves verbal, non verbal, written, visual, listening, empathising etc. and other means of expression.
b.*Environmental Studies *: Deals with every issue that affects an organism. It is essentially a multidisciplinary approach that brings about an appreciation of our natural world and human impacts on its integrity. It is an applied science as it seeks practical answers to making human civilization sustainable on the earth's finite resources. Its components include Biology, Geology, Chemistry, Physics, Engineering, Sociology, Health, Anthropology, Economics, Statistics, Computers and Philosophy.

ii) **Discipline Specific Core (DSC) Course:** There may be a Core Course in every semester. This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

iii) **Elective Course:** A course which can be chosen from pool of courses / papers and which may be very specific or specialized or advanced or supportive to the discipline / subject of study or which provides an extended scope or which enables an exposure to some other discipline / subject / domain or nurtures the students proficiency / skill is called an elective course.
An elective may be "Generic Elective" focusing on those courses which add generic proficiency to the students. An elective may be "Discipline centric" or may be chosen from an unrelated discipline. It may be called an "Open Elective."

iv) **Discipline Specific Elective (DSE) Course:** Elective courses offered under the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study). It is the specialized / emerging study area allied to the core subject.

v) **Generic Elective Course (GEC) :** An elective course chosen from an unrelated discipline/subject, with an intention to seek exposure beyond discipline/s of choice is called a Generic Elective. The purpose of this category of courses is to offer the students the option to explore disciplines of interest beyond the choices they make in Core and Discipline Specific Elective papers.

P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.

vi) **Open Elective Course (OEC)** : The group of different choice based courses comprising of general interest courses related to discipline specific core (DSC) subjects or of interdisciplinary nature, MOOCs offered by different authorized agencies, open skill courses.

vii) **Generic Open Elective course (GOEC) :**The group of different important choice based courses (may be of interdisciplinary nature) related to the fundamental growth of students as a responsible citizen of India.

viii) **General Interest Course (GIC) :** General interest course is a course taken out of interest rather than for academic reasons. It may be chosen from different subjects / courses from the discipline or inter-discipline and the curriculum of these courses shall be designed by respective College/Institute/University Department and approved by the respective BOS. The nature of these courses shall be of self-study nature under the guidance of teacher / mentor / faculty member concerned. The evaluation of these courses shall be done by teacher / mentor / faculty member concerned (may be in the form of assignment / written test / project etc.) and marks and grades shall be communicated to the University.

ix) **MOOCs:** Massive Open Online Courses (MOOCs) are such online courses which are developed as per the pedagogy and following the four quadrant approach consisting of video, text, self assessment and learn more.

x) **Skill Enhancement Course (SEC) :**This course may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge and should contain both theory and lab/hands-on training/field work to increase employability of the students.

xi) **Project:** A course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a student studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project.

xii) **Research Project/Dissertation:** A course designed to acquire special / advanced knowledge/Research with an advisory support / guidance by a teacher / faculty member.

xiii) **Foundation Course:** The Foundation Courses may be of two kinds: Compulsory Foundation and Elective foundation. “Compulsory Foundation” courses are the courses based upon the content that leads to Knowledge enhancement. Elective Foundation courses are value-based and are aimed at man-making education.

xiv) **Skill Enhancement Module (SEM) :** The module is based on the application of the subjects discipline specific core (DSC), discipline specific elective (DSE), communication skills in English subjects to provide skills to the students for developing their employment / self-employment / entrepreneurship capabilities.

E. **Examinational Credits:** Examinational Credits allows a student to receive credit for learning by demonstrating mastery of course outcomes—skills and knowledge—by taking the course exam(s). Some exams may require performance of a skill set, while other exams may be written tests covering course content.

F. **Ancillary Credits :** credits earned by the students by participating in Sports / Extra Curricular Activities / Unnat Bharat Abhiyan / Internship / Field work / Work experience / Avishkar / Induction programme / NSS / NCC/ Cultural Activities / Inter University Academic Activities and other activities prescribed by the University from time to time but other than core or elective courses.

G. **Internship / Field Work / Work Experience :** The prescribed hours of practical / on field training related to any Discipline Specific Core (DSC)course with any institute / firm / industry / establishment as identified by College/Institute/University Department.

H. **Induction Programme:** A programme of prescribed duration specially designed for the first year / first semester students to make the students feel comfortable in their new environment, set a healthy daily routine, create bonding in the batch as well as between faculty members, develop awareness, sensitivity, self-exploration and understanding of society at large, and nature also to inculcate in them ethos and culture of the College/Institute/University Department.

I. **Activity:**

i. **Curricular Activity :-**Activities relating to the subjects comprising a course of study in the College/Institution/University Departments

ii. **Co-curricular Activity :-** Co-curricular refers to activities, programs and learning experience that complement in some way, what students are learning in college/institution/university departments. These activities are connected to the academic curriculum like Extension Activities, Debates, Quiz competition, seminars etc.

iii. **Extra-curricular Activity :-**Extra-curricular takes place in addition/outside to regular curriculum including but not limited to Sports, Start-up, Hackathon, Avishkar, Students Exchange Program, Social Activities, Volunteering, NSS, NCC, Annual Gatherings, TRDEA (Teaching, Research, Development and Extension Activities) etc.

J. **Faculty member:** Faculty member means an individual qualified as per statutory Regulations, working on Full Time basis in an Institution/ University Department/College.

K. Teacher : Teacher means full time approved Professor, Associate Professor, Assistant Professor, Reader, Lecturer, Librarian, Principal, Director of institution, Director of Knowledge Resource Centre, Director of Centre of Lifelong Learning and Extension, Deputy and Assistant Librarian, in the University, College Librarian, Director or Instructor of physical Education in any University Department, Conducted, Affiliated, or Autonomous College, Autonomous Institutions or Department or Recognized Institutions of the University**.**

L. **Student:** Student means an individual who is admitted and registered for an academic programme of the University or Affiliated, Conducted, Autonomous Colleges, Recognized Institutions and Departments of the University.

M. **Inter-disciplinary studies:** Inter-disciplinary studies mean the combined academic studies and research in different disciplines as prescribed.

N. **Multi-disciplinary studies:** Multi-disciplinary studies mean the combined academic studies and research in different streams of a particular discipline as prescribed.

O. **Level:** Level means Diploma, Post Diploma Certificate, Under Graduate Degree, Post Graduate Diploma and Post Graduate Degree Programmes.

P. **Laboratory Work (Lab):** The skill course based on the practical related to any or more Discipline Specific Core (DSC) course / Discipline Specific Elective (DSE) course as prescribed in Teaching-Learning schemes.

Q. **MCQs:** Multiple Choice Questions based on any / all units of a particular course of the programme.

R. **Online Learning (OL)**: Online Learning mode means a mode of providing flexible learning opportunities by overcoming separation of teacher and learner using a variety of media, including print, electronic, MOOCs in a totally online mode.

S. **MOOCs:** Massive Open Online Courses (MOOCs) are such online courses which are developed as per the pedagogy and following the four quadrant approach consisting of video, text, self assessment and learn more.

T. **SWAYAM:** SWAYAM is the indigenous platform of the MHRD, GOI providing an integrated portal and platform for hosting Massive Open Online Courses (MOOCS) developed under the aegis of NME-ICT. Government of India adopted the MOOCs concept to supplement the formal education system in the country from high school to higher education, named aptly as the "Study Webs of Active-Learning for Young Aspiring Minds" (SWAYAM). It hosts various courses based on curriculum, continuing education and skill.

U. **Credit :** Credit means the standard methodology of calculating one hour of theory, one hour of tutorial, two hours of laboratory work / practical work / field work per week for a duration of a semester resulting in the award of one credit which is awarded by College/Institute/University Department. Credit for internship shall be one credit per week of internship, subject to a maximum of six credits.

V. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P, F and Ab.

W. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.

X. **Credit Point:** it is the product of grade point and number of credits for a course.

Y. **Credit Grade Report:** It is a report showing cumulative performance of a student in a given semester of the academic program. It shall display maximum, minimum and total marks of a course as per the scheme of teaching, learning and examination, evaluation as well as it will show the obtained : marks, credits, grade points, letter grade, SGPA, CGPA, percentage of total marks, class/division, incentive marks, remarks, result, exemptions and also other requisite information as prescribed.

Z. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

AA. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

BB. **Transcript :-**Transcript will display the program details like, all Semesters SGPA with details, Non-Examinational Credits with details as well as CGPA and Class/Division.

Programme Specific provisions

30. There shall be for examination leading to the Degree of Master of Science (M.Sc.) namely :-
(i) M.Sc. Part –I (Semester I and II) at the end of each semester;
(ii) M.Sc. Part –II (Semester III and IV) at the end of each semester

31. Subject to their compliance with the provisions of this Direction and of other Ordinances in force from time to time, the following candidate shall be eligible for admission.
(A) For M.Sc. Part-I Semester-I & II (विज्ञान पारंगत भाग-१ प्रथम व द्वितीय सत्र)
(a) a collegiate candidate having Bachelor of Science Degree in concerned subject of the University or an equivalent Degree of any other statutory University with English as one of the subject of passing.
(b) For admission to M.Sc. (Mathematics/Statistics) a candidate shall have offered Mathematics/Statistics at the B.Sc. Degree or Bachelor of Computer Application.
i) for admission to M.Sc. (Micro-biology) a candidate shall have offered Micro-biology or Industrial Micro-biology subject at the B.Sc. Degree.
ii) for admission to M.Sc.(Bio-chemistry) a candidate shall have offered Bio-chemistry subject at the B.Sc. Degree or candidate having the Bachelor Degree in Pharmacy or the Bachelor Degree in Agriculture Science.
In case of vacancies, a candidate offering Chemistry along with Biological Science shall be eligible.

(c) i) for admission to M.Sc. Electronics a candidate shall have offered or Electronics (Instrumentation) or Physics or Electronics or Electronics Science or Computer Maintenance as subjects at the B.Sc. Degree or B.C.A. Degree of this University or any other equivalent Degree of Statutory University.

ii) a candidate having P.G. Diploma in Bio-medical Electronics or Mechatronics of Sant Gadge Baba Amravati University is eligible to take admission directly at M.Sc. Semester III of the subject Electronics. Such a student who is admitted to Semester III of the subject Electronics shall be awarded M.Sc. Degree on the basis of their performance at M.Sc. Part II (Semester III & IV) only.

(d) for admission to M.Sc. Geography a candidate shall have offered Geography subject at the B.Sc. Degree.

(e) for admission to M.Sc. Petrochemical Science, a candidate shall have offered Petrochemical Science subject at the B.Sc. Degree.

(f) i) for admission to M.Sc.(Environmental Science) a candidate shall have offered Environmental Science or Life Sciences or Micro-biology or Bio-chemistry or Bio-technology at B.Sc. Degree,

ii) Sixty percent seats of the total intake shall be reserved for students who have passed B.Sc. with Environmental Science. If students having Environmental Science subject are not available then students having other optional subjects as mentioned in (g) i) may be considered.

(g) for admission to M.Sc.(Geo-informatics) or Remote Sensing and GIS, a candidate shall have obtained B.Sc. degree in any subject or B.Sc. Agriculture & Horticulture or Engineering graduates and at least 50% of seats preferably for students opting Geology subject at under graduate level.

(h) for admission to M.Sc.(Bio-informatics), a candidate shall have passed B.Sc. in any discipline of Life Sciences, Bio-sciences or Bachelor Degree in Agriculture, Veterinary and Fishery Sciences, Pharmacy or Medical Sciences - Bachelor of Medicine and Bachelor of Surgery, Bachelor of Dental Surgery, B.A.M.S., B.H.M.S. or any equivalent examination recognized by Sant Gadge Baba Amravati University.

(i) for admission to M.Sc. Computer Software, a candidate shall have passed the Degree of Bachelor of Science with Computer Science/Vocational Computer Application subjects,

OR

the Degree of Bachelor of Science with Post Graduate Diploma in Computer Science of Sant Gadge Baba Amravati University.

OR

the Candidates having B.C.A. Degree of Sant Gadge Baba Amravati University shall be eligible to take admission to M.Sc.(Computer Software) course.

(j) for admission to M.Sc. Pharmaceutical Chemistry a candidate shall have offered Chemistry or Industrial Chemistry or Bio-chemistry at the B.Sc. Degree.

(k) for admission to M.Sc. (Computer Science), a candidate shall have-

i) Degree of Bachelor of Science of this University with Computer Science / Computer Application (Vocational) as one of the subjects.

OR

ii) B.A. / B.Sc. Degree with Mathematics and Post Graduate Diploma in Computer Science of this University.

OR

iii) Degree of Bachelor of Computer Application.

(l) For admission to M.Sc. (Biotechnology), a candidate shall have –

i) B.Sc. Degree in any subject of Life Sciences, Bio Sciences or Bachelor's Degree in Agriculture, Veterinary and fishery Sciences, Pharmacy, or Bachelor of Medicine and Bachelor of Surgery (M.B.B.S.) or Bachelor of Dental Surgery or equivalent examination recognized by Sant Gadge Baba Amravati University are eligible to appear in entrance test as prescribed by the University.

ii) have minimum 50% marks as aggregate in the Degree course.

(m) The students passing B.Sc. Agriculture with specialization Entomology and Fisheries shall be eligible for admission to M.Sc. Zoology with specialization Entomology and Fisheries respectively.

(B) ForM.Sc. Part-II Semester III & IV (विज्ञानपारंगत भाग-२ सत्र ३ व ४)

(a) The candidate who have completed Semester I & II of M.Sc. part – I & have earned 50% of examination credits form DSC & DSE courses from Semester I & II togetheris eligible for admission to M.Sc. Part – II Semester III & IV.

(b) a candidate passing B.E. (Electronics & Telecommunication or Industrial Electronics) Examination of Sant Gadge Baba Amravati University is eligible to take admission directly at second year (Semester – III) of M.Sc. Electronics. Such a candidate who is admitted to second year of M.Sc. Electronics shall be awarded M.Sc. Degree on the basis of his performance at M.Sc. Part-II only.

(c) The students having Degree of M.Sc. (Computer Software) shall be eligible for directly admission to M.Sc. Part-II (Semester-III) (Computer Science) in the faculty of Science & Technology within the jurisdiction of Sant Gadge Baba Amravati University, Amravati. The class / Grade for awarding the Degree of M.Sc. (Computer Science) shall be awarded on the basis of performance at M.Sc. Part-II (Computer Science) only.

32. Every candidate for admission to the examination shall offer one of the following subjects for his examination, namely-

(1) Mathematics, (2) Physics, (3) Chemistry, (4) Botany, (5) Zoology, (6) Geology, (7) Statistics, (8) Bio-chemistry, (9) Micro-biology, (10) Electronics, (11) Geography, (12) Geo-informatics, (13) Remote Sensing & GIS, (14) Environmental Science, (15) Bio-informatics, (16) Computer Software, (17) Computer Science, (18) Bio-technology and (19) Pharmaceutical Chemistry.

Provided that an examinee who has awarded Degree in any one of the subject listed above from 1 to 19 & desires of appearing to any other subject opted at B.Sc. level by prosecuting regular programme of study and satisfied the eligibility conditions as provided in the Table 1.

Table 6 Eligibility for Admission, Examination and Promotion

Sr. No.	Name of the Exam. Admission to Semester	The student should have passed the examination of	The student should have completed the following session / term satisfactorily with minimum prescribed residence time	The student shall have earned minimum Credits
1	M.Sc. Part – I Semester-I	As mentioned in Para 31	Semester-I	--
2	M.Sc. Part- I- Semester-II	--	Semester-II	--
3	M.Sc. Part-II Semester-III	--	Semester-III	50% of exam credit form DSC & DSE courses t from Semester I & II together or as per para 3 (B)
4	M.Sc. Part-II Semester-IV		Semester-IV	--

33. The papers for Examinations shall be as under-

For the M.Sc. Part-I & Part-II (Semester-I to IV) Examination –

(A) **Discipline Specific Core (DSC)**

This component will include the courses of core studies having credits as shown in the scheme of Teaching & Learning for the Programme.

(B) **Discipline Specific Elective (DSE)**

In Semester III & IV, there shall be Discipline Specific Elective (DSE) papers related to a specialized area of study in the subject out of elective papers prescribed by the University.

(C) **Skills Enhancement Course (SEC)**

In Semester IV, there shall be compulsory Skill Paper based on the concerned subject where students are expected to learn skills to be employable or become entrepreneur after PG Programme.

34. There shall be no classification of examinees successful at the M.Sc. Semester- I to III Examination.

35.Successful examinees at the M.Sc. Final, Semester -IV , (विज्ञान पारंगत सत्र-4) Examination shall be placed in Class / Division as follows:

Equivalence of Class/Division to corresponding C.G.P.A.

Sr. No.	C.G.P.A.	Class/Division
1	7.5 or more than 7.5	First Class with Distinction
2	6.00 or more but less than or equal to 7.49	First Class
3	5.50 or more but less than or equal to 5.99	Higher Second Class
4	5.00 or more but less than or equal to 5.49	Second Class
5	4.00 or more but less than or equal to 4.99	Pass

36. The student who has earned Credits as per the Table 8 of Credit distribution of the programme at M.Sc. Part-I (Semester-I & II) Examination and M.Sc. Part-II (Semester-III & IV) Examination out of minimum credits prescribed for M. Sc. Degree Examination, shall be entitled to receive a Grade report signed by the Director, Examination and Evaluation. After passing the M.Sc. Part-II (Semester-IV) Final Examination and satisfying other conditions as per Ordinance No. 19 and on payment of prescribed fee, the examinee will receive a Degree in the prescribed form signed by the Vice-Chancellor.

Further, on request & payment of prescribed fees, the examinee shall receive a transcript signed by the Director, Examination & Evaluation. The Degree will be awarded on the basis of CGPA.

Table 8

S.N.	Courses [Semester I, Semester II, Semester III and Semester IV]	Minimum Credits to be earned by student for award of Master's (PG) Degree
1	DSE	**85**
2	DSE	
3	AEC	
4	SEC	
5	Ancillary : Internship /FP	**02**
6	Ancillary : of/MOOCS/CC	**01**
Total Credits		**88**

DSC : Discipline Specific Core, DSE : Descipline Specific Elective, AEC : Ability Enhancement Course, SEC : Sill Enhancement Course, FP : Field Projects, OE : Open Elective Course, MOOCS : Massive Open Online Courses, CC: Co-curricular Courses

37. The existing Ordinance No. 4/2008, Direction No. 26/2010, 27/2010, 39/2011 and 25/2012 of the programme shall be repealed stage-wise and only applicable to the students who have already sought their admissions as per its provisions and shall repealed after exhausting the chances given to the failure students of old programme by the University. Similarly, the Direction No. 78/2022 dated 06/10/2022 has been repealed and replaced by this Direction, since as per proviso 12(8) of Maharashtra Public Universities Act, 2016, the Direction shall have to be converted into Statute, Ordinance or Regulations as the case may be within 06 months of issuing such Directions, failing which such Direction shall automatically lapsed.

Appendix-F

Master of Science (M.Sc) Full Time Two Years Degree Programme :-

1) A Student shall have to be admitted every year in the respective Institute/ College/University Department for completion of an Academic Year of this two year Degree programme.

2) The M.Sc. Degree shall consists of four semesters i.e. Semester I & II in the first Academic Year, Semester III & IV in the second Academic Year.

3) Student has to complete all four Semesters for the award of Degree of Master of Science and should fulfill conditions as per Ordinance No. 19.

4) Every Semester of M.Sc. programme shall be of at least 90 teaching days in a semester and shall be of at least 180 teaching days in an Academic Year.

Date :- 11 /10/2023.

Sd/-

(Dr. Pramod G. Yeole)

In-charge Vice-Chancellor,

Sant Gadge Baba Amravati University,

Amravati

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Scheme of Teaching, Learning, Examination and evaluation leading to the Degree of Master of Science in the programme other than Mathematics, Bio-Technology & Computer Science

(Two Years- Four Semesters Degree Programme-C.B.C.S)

(M.Sc.Part-I)Semester-I

S. N.	Subject	Subject Code	Teaching &Learning Scheme							Duration of Exam Hours	Examination & Evaluation Scheme						
			Teaching Period Per Week				Credits				Maximum Marks					Minimum Passing	
											Theory		Practical		Total Marks		
			L	T	P	Total	L/T	Practical	Total		Theory+ MCQ External	Theory Internal	Internal	External		Marks	Grade
1	DSC – I		3	-	-	3	3	-	3	3	80	20	-	-	100	40	P
2	AEC onDSC-1		-	1	-	1	1	-	1	1	-	-	25	-	25	10	P
3	DSC-II		4	-	-	4	4	-	4	3	80	20	-	-	100	40	P
4	DSC--III		4	-	-	4	4	-	4	3	80	20	-	-	100	40	P
5	DSE-I(A/B/C/D)		4	-	-	4	4	-	4	3	80	20	-	-	100	40	P
6	Lab-1		-	-	6	6	-	3	3	*	-	-	-	100	100	50	P
7	Lab-2		-	-	6	6	-	3	3	*	-	-	-	100	100	50	P
8	**#Internship/Field Work/Work Experience@**																
9	**Open elective/GIC/Open skill/MOOC***																
	TOTAL					28			22						625		

L:Lecture, T:Tutorial, P:Practical

#Students may complete their Internship/Field Work/Work Experience in First OR Second OR Third Semester of Master of Science in the programme other than Mathematics, Bio-Technology & Computer Science according to their convenience; @ denotes Non-Examination Credit

Note : Internship /Apprenticeship/Field Work / Work Experience (During vacations of Semester I to Semester III) for duration of minimum 60 hours mandatory to all the students, to be completed during vacations of Semester I to III. This will carry 2 Credits for learning of 60 hours. Its credits and grades will be reflected in final semester IV credit grade report.

-OEC(Optional) can be studied during semester I to IV

SANT GADGE BABA AMRAVATI UNIVERSITY GAZETTE - 2023 - PART ONE – 665

Annexure–A-2

Scheme of Teaching, Learning, Examination and Evaluation leading to the Degree Master of Science in the programme other than Mathematics, Bio-technology & Computer Science

(Two Years-Four Semesters Degree Programme-C.B.C.S)

(M. Sc .Part-I)Semester-II

S. N.	Subject	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme						
			Teaching Period Per Week				Credits				Maximum Marks					Minimum Passing	
											Theory		Practical		Total Marks		
			L	T	P	Total	L/T	Practical	Total		Theory+ MCQ External	TheoryInternal	Internal	External		Marks	Grade
1	DSC – IV		3	-	-	3	3	-	3	3	80	20	-	-	100	40	P
2	AEC on DSC-IV		-	1	-	1	1	-	1	1	-	-	25	-	25	10	P
3	DSC-V		4	-	-	4	4	-	4	3	80	20	-	-	100	40	P
4	DSC--VI		4	-	-	4	4	-	4	3	80	20	-	-	100	40	P
5	DSE-II(A/B/C/D)		4	-	-	4	4	-	4	3	80	20	-	-	100	40	P
6	Lab-3		-	-	6	6	-	3	3	*	-	-	-	100	100	50	P
7	Lab-4		-	-	6	6	-	3	3	*	-	-	-	100	100	50	P
8	**#Internship/Field Work/Work Experience@**																
9	**Open elective/GIC/Open skill/MOOC***																
	TOTAL					28			22						625		

#Students may complete their Internship/Field Work/Work Experience in First OR Second OR Third Semester of Master of Science in the programme other than Mathematics, Bio-Technology
& Computer Science according to their convenience;@ denotes Non-Examination Credit.

GENERAL SCHEME

Sant Gadge Baba Amravati University Amravati

Scheme of Teaching, Learning & Examination leading to the DegreeMaster of Science (Mathematics)-2023-24

(Two Years ... Four Semesters Degree Course- C.B.C.S) (M. Sc. Part-II) Semester- III

S. N.	Subject	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme						
			Teaching Period Per Week				Credits				Maximum Marks					Minimum Passing	
											Theory		Practical		Total Marks		
			L	T	P	Total	L/ T	Practical	Total		Theory+MCQ External	Theory Internal	Internal	External		Marks	Grade
1	DSC I Functional Analysis-I		4	-	-	4	4	-	4	3	80	20			100	40	P
2	DSC II Advanced Mechanics		6	-	-	6	6	-	6	3	80	20			100	40	P
3	DSC-III Operational Research		6	-	-	6	6	-	6	3	80	20			100	40	P
4	DSE IV/V General Relativity (Optional)		6	-	-	6	6	-	6	3	80	20			100	40	P
5	DSE IV/V Difference Equation – I (Optional)		6			6	6		6	3	80	20			100	40	P
7	DSE IV/V Fluid Dynamics–I (Optional)																
8	DSE IV/V Advanced Complex Analysis –I (Optional)																
9	DSE IV/V Banach Algebras-I (Optional)																
8	**SEC (Skill Enhancement Course)** **1. Vedic Mathematics** **OR** **2. Arc Radius Goba Verification and its Applications**		2			2			2		40	10			50	20	P
	TOTAL					30			30						550		

L: Lecture, T: Tutorial, P: Practical

(Two Years ... Four Semesters Degree Course- C.B.C.S) (M. Sc. Part-II) Semester- IV

S. N.	Subject	Subject Code	Teaching & Learning Scheme							DurationOf ExamHours	Examination & Evaluation Scheme						
			Teaching Period Per Week				Credits				Maximum Marks					Minimum Passing	
											Theory		Practical		Total Marks		
			L	T	P	Total	L/ T	Practical	Total		Theory+MCQ External	Theory Internal	Internal	External		Marks	Grade
1	DSC-I Functional Analysis-II		6	-	-	6	6	-	6	3	80	20			100	40	P
2	DSC-II Partial Differential Equations		6	-	-	6	6	-	6	3	80	20			100	40	P
3	DSC-III Numerical Analysis		6	-	-	6	6	-	6	3	80	20			100	40	P
4	DSE-IV/V Relativistic Cosmology (Optional)		6	-	-	6	6	-	6	3	80	20			100	40	P
5	DSE-IV/V Fluid Dynamics–II (Optional)		6			6	6		6	3	80	20			100	40	P
7	DSE-IV/V Difference Equation –II (Optional)																
8	DSE-IV/V Lie Groups (Optional)																
9	DSE-IV/V Banach Algebras-II (Optional)																
8	Research/Innovative Project/ Dissertation								5		50	50			100	50	P
	TOTAL					30			35						600		

L: Lecture, T: Tutorial, P: Practical