University of Mumbai

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NAAC ACCREDITED
(2001-2006)

Manual

On

Semester Based,

Credit and Grading System

For

Under Graduates (UG) Programmes

Under

The Faculty of Science

With Effect from the Academic Year

2011-12

Manual on Choice Based Credit Systems (CBCS) and Grading implemented in University of Mumbai:–

First Edition: May-June, 2011

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An official Manual of Choice Based Credit Systems (CBCS) and Grading is being published for the first time for the use of administrators, teachers, administrative staff and learners to make them acquainted with the Choice Based Credit and Grading system to be implemented at the University of Mumbai with effect from the Academic Year 2010-11. The following members have contributed for writing of the content of this manual and its preparation.

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University of Mumbai

FOREWORD

It gives me great pleasure to present the first edition of the Manual on Semester Based Credit and Grading System developed for the University of Mumbai. This, to my mind, is not just a matter of mere compliance of directives or recommendations stipulated from time to time by the University Grants Commission, the National Knowledge Commission and the Governmental bodies, but rather is the outcome of an exhaustive exercise involving serious deliberations with representatives of all the Faculties under the University of Mumbai. While doing so, conscious efforts have been made to incorporate the unique needs of each faculty and align these with the credit based systems operating elsewhere in the country as well as in other parts of the globe.

It is hardly a debatable matter now as to whether a University or any other higher education provider for that matter should adopt a Credit Based System or not. We must recognize the fact that every student has the right to learn what he wants to learn and from wherever he wants to learn. The system of assigning Credits to each course or module undertaken and allowing flexibility of course combinations both within an institution as well as across institution respects this 'Autonomy' of the student. We are today living in an age where – thanks to the interventions of technology – it should be possible for every student to create his own course combinations through picking and choosing from various institutions and construct his own degree in a typical 'cafeteria' approach to learning. This will only happen if all the higher education providers speak the same language. The Credit Based System which provides a clear accounting of the student's efforts and learning load, places the student at the centre stage of all academic transactions and facilitates the bringing of all the education providers on a common platform. In this sense, the system is ideally suited for respecting the independence of the student and promoting the much required 'Learner Mobility'. It is imperative; therefore, that every forward looking institution takes a bold step in setting up an appropriate Credit Based System and the University of Mumbai cannot afford to lag behind.

This being the First Edition of the specially prepared Manual in this regard, we are fully aware that there are bound to be modifications that would be required in subsequent editions. An attempt has been made here, however, to explain each new concept and term, relate it to the prevalent system, and illustrate how it can be implemented. While it cannot be claimed that every conceivable issue arising as a result of adoption of the Credit Based System has been addressed in this manual, I do believe

that the major matters have been suitable dealt with. I am especially thankful to all the Deans of the different Faculties of the University and all the others who have painstakingly contributed in one way or the other to see that the Manual has reached its present form.

I now request each user of this Manual to not only acquaint himself/ herself with the basic concepts, terminology and operational steps stated herein, but to actually implement the system and experience its strengths. I am fully aware that switching over from an age-old system to a completely new one is not an easy task, particularly in view of the fact that the implementation has to take place on a massive scale. This is undoubtedly going to call for a new learning, additional efforts on the part of the teaching community and above all, a different mind-set. I am confident, however, that in due course, all the doubts and misgiving that may exist about this system will be sorted out and that with all the inputs and suggestions coming from different quarters, we shall soon be able to come out with a modified and improved next edition of this manual. I look forward to this day and I wish each one of you the very best in your efforts at serving the students better.

Keeping in mind the learner centric approach.

Best wishes!

Date: - 09th June, 2011 (Dr. Rajan Welukar)
Place: - Mumbai Vice Chancellor

University of Mumbai

P R E F A C E

It is a great pleasure for me to get the opportunity to contribute in writing of this manual and present this information and guidelines of Semester Based Credit and Grading System in the form of Manual.

The Ordinances and Regulations related to introduction of semester pattern with Credit and Grading System for UG and PG programmes of Arts, Science and Commerce faculties have been accepted by the Academic Council at its meeting held on 10th June, 2010 vide Item No. 4.86, 4.61 and 4.66 respectively and subsequently the Management Council has given the concurrence at its meeting held on 18th July, 2010 to the Credit and Grade Point System with minor changes and resolved to conduct the workshops and training programmes for the teachers and administrative staff to make them acquainted with the system of Credit and Grade Point System. In pursuance of the resolution of the Management Council, a series of meetings of all the Deans of faculties and Controller of Examinations were convened by the Hon'ble Vice Chancellor. The Deans of various faculties submitted a strategy for implementation steps of this Semester Based Credit and Grading System.

This manual of information containing the guidelines of Semester Based, Credit and Grade Point System about the programmes under the faculty of Arts, Science and Commerce. This manual consists of six units with subunits. The first unit has explained about all the introductory information about the need of reforms in the higher education, recommendation of various committees, national regulatory bodies and the information of the reforms are taking place at the international & national level. It is also explain about the introduction of Choice Based Credit System and its scientific approach of the implementation.

The second unit of this manual has explained about the basic concept of credit based systems and its terminology with credit transfer, credit shelf and so on. The credit transfer is one of the best practices which will help the learner to transfer from one course to another with accumulating the required credits. The third unit has elaborated the curriculum development policy of University of Mumbai which has explained the various levels of the programme along with its duration and the eligibility criteria. The fourth and fifth unit has explained about the assignments of credits to the courses, semesters & programmes and the complete grade point system respectively.

I am very much thankful to the present & former Deans of Various Faculties, Chairpersons of Various BOS and Dr. (Mrs.) Anuradha Deshmukh for contributing the information in this manual. I am grateful to the Hon'ble Vice Chancellor Dr. Rajan Welukar for giving me the opportunity to publish this informative document in the form of Manual and also for his continuous support and guidance to me in compiling this valuable information and present before to you all.

I am sure that this manual of detailed information will easy to understand the Credit & Grading system and definitely useful to all the stake holders and learners in particular.

Thanking You!

Place: - Mumbai
Date: - 09th June, 2011

(Prof. Vilas B. Shinde)
Controller of Examinations

Unit 1: Introduction

1.1 Need for academic reforms in Indian Higher Education

Higher education today, especially in the Indian context has assumed major importance. Although operating one of the largest systems of higher education in the world and despite the fact that India is a much favoured destination for education especially among the developing countries, there are frequent concerns about the quality of education imparted and its overall impact on the country's nation building process. Particularly under attack is the resistance to bring about long term academic reforms in the system. Among the various lacunas in the system is the absence of a comprehensive national framework for facilitating mutual give and take of the academic programmes offered by the different higher education providers in the country. With 'twinning programmes' and 'joint degree' initiatives as well as 'study abroad' programmes gaining increased momentum in several parts of the globe, the importance given to 'mobility of learners' and the need for offering flexible curricular choices to them, it has now become necessary to take a serious re-look at the system and introduce reforms wherever possible.

1.2 Recommendations of National Regulatory Authorities

The University Grants Commission (UGC), the **National Assessment and Accreditation Council (NAAC),** the **Distance Education Council (DEC)** and even the **National Knowledge Commission (NKC)** have time and again come out with recommendations for improving the quality and effectiveness of Higher education provisions in the country. The ministry of Human Resource Development at the Central level and the Ministry of Higher & Technical Education, Govt. of Maharashtra have also repeatedly stressed on the need for universities to pay prompt attention to some of the weaknesses that plague the system and undermine its very credibility. An important concern voiced more strongly in recent times, is the need to develop a Choice-Based Credit System (CBCS) in tune with global trends and the adoption of a sound grading system for reflecting learner performance. To quote Shri S. K. Tripathi, former Secretary, Dept. of Secondary and Higher Education, Ministry of Human Resource Development, Govt. of India, "..... *The demand for socially relevant, economically productive, globally competitive, culturally sustaining and individually satisfying programmes that cater to the needs of the present times is fast growing. The constraints of pursuing programmes and participation in pre-determined combination of Courses pose rigidities not in keeping with the demands of the changing times….* ***There is today a need for a fully convertible credit-based system acceptable to other universities.***

Recommendation of the UGC in its *Action Plan for Academic and Administrative Reforms* (Ref. UGC letters January 2008; March 2009)

"……. *Curricular flexibility and learners' mobility is an issue that warrants our urgent attention. These can be addressed by introducing credit based courses and credit accumulation. In order to provide with some degree of flexibility to learners, we need to provide for course duration in terms of credit hours and also a minimum as well as a maximum permissible span of time in which a course can be completed by a learner… The*

Choice-Based Credit System (CBCS) imminently fits into the emerging socioeconomic milieu, and could effectively respond to the educational and occupational aspirations of the upcoming generations. In view of this, institutions of higher education in India would do well to invest thought and resources into introducing CBCS. Aided by modern communication and information technology, CBCS has a high probability to be operationalised efficiently and effectively — elevating learners, institutions and higher education system in the country to newer heights…".

The **National Knowledge Commission (NKC)** under the chairmanship of Mr. Sam Pitroda, in its report to the Prime Minister on 29th November 2006) has also reiterated the importance of Higher education and the contribution it has made to economic development, social progress and political democracy in independent India. However, the Commission has also pointed out to a "serious cause for concern" at this juncture. According to Mr. Pitroda, " *…. it is important for us to recognize that there is a quiet crisis in higher education in India which runs deep. And the time has come to address this crisis in a systematic, forthright manner. .... There is today a need for a transition to a course credit system where degrees are granted on the basis of completing a requisite number of credits from different courses, which provides learners with choices….*

The **National Assessment and Accreditation Council (NAAC)** also gives special importance to ascertaining whether a Choice Based Credit System (CBCS) is in place in any given institution when assessing it.

1.2.1 At the global level

All the major higher education providers across the globe are operating a system of credits. The European Credit Transfer System (ECTS), the 'National Qualifications Framework' in Australia, the Pan-Canadian Protocol on the Transferability of University Credits, the Credit Accumulation and Transfer System (CATS) in the UK as well as the systems operating in the US, Japan, etc are examples of these.

1.2.2 The Concept of CBCS in brief

While explanations of the several terms related to the development of a Choice-Based Credit System are given later, it is important to know that CBCS essentially implies a redefining of the curriculum into smaller measurable entities or 'modules' with the hours required for studying/'learning' these – not ''teaching' - being at the primary focus and the development of a mechanism whereby theses modules can be combined in different ways so as to qualify for a Certificate, Diploma or Degree. In a sense, therefore, the completion of a single 'Module' of learning can pave the way for learning other modules either in the same institution or elsewhere and a combination of modules in keeping with the needs and interests of the learners illustrates the much talked about 'cafeteria approach' to learning with the Learner at the centre stage of al academic transactions.

1.3 Rationale for introduction of CBCS

The UGC while outlining the several unique features of the Choice-Based Credit System (CBCS) has, in fact, given in a nutshell, the rationale for its introduction. Among the features highlighted by the UGC are: *Enhanced learning opportunities, ability to match learners' scholastic needs and aspirations, inter-institution transferability of learners (following the completion of a semester), part-completion of an academic programme in the institution of enrolment and part-completion in a specialized (and recognized) institution, improvement in educational quality and excellence, flexibility for working learners to complete the programme over an extended period of time, standardization and comparability of educational programmes across the country, etc.* Some of the specific advantages of using the Credit system as outlined in the available literature on the topic are as listed below:

Advantages of the Credit System

- Represents a much-required shift in focus from teacher-centric to learner-centric education since the workload estimated is based on the investment of time in learning, not in teaching.
- Helps to record course work and to document learner workload realistically since all activities are taken into account - not only the time learners spend in lectures or seminars but also the time they need for individual learning and the preparation of examinations etc.
- Segments learning experience into calibrated units, which can be accumulated in order to gain an academic award.
- Helps self-paced learning. Learners may undertake as many credits as they can cope with without having to repeat all the courses in a given semester if they fail in one or more courses. Alternatively, they can choose other courses and continue their studies.
- Affords more flexibility to the learners allowing them to choose inter-disciplinary courses, change majors, programmes, etc.
- Respects 'Learner Autonomy'. Allows learners to choose according to their own learning needs, interests and aptitudes.
- Makes education more broad-based. One can take credits by combining unique combinations. For example, if a learner is studying music, he/she can also simultaneously take a course in Business Management.
- Facilitates Learner Mobility. Offers the opportunity to study at different times and in different places. Credits earned at one institution can be transferred to another.
- Helps in working out twinning programmes.
- Is beneficial for achieving more transparency and compatibility between different educational structures.
- A credit system can facilitate recognition procedures as well as access to higher education for non-traditional learners.

1.4 Scientific approach to implementation

Any institution desirous of working out a comprehensive Credit system needs to adopt a systematic approach that handles most, if not all the aspects that need attention. Introducing the Credit system without adequate policy formulation and clear implementation guidelines is quite likely to encounter problems that are dealt with through ad hoc decisions. Such decisions may have long-term consequences which cannot easily be set right. Care has to be taken to see that the learner who must be the ultimate beneficiary of the system, does not suffer academically because of absence of procedures or lack of adequate attention to detail when evolving the system. Apart from the fact that any form of injustice caused to the learner - the ultimate 'consumer' in the educational process – can lead to legal issues, the lack of a comprehensive approach may affect the key features like curricular flexibility, learner autonomy and learner mobility that are central to the system. The following major steps should, therefore, be taken by any higher education provider wanting to introduce the Credit System. The steps given herein apply both to the annual pattern as well as the semester pattern. These have been grouped into two categories viz. steps to be taken at the programme level, involving a micro-approach and steps to be taken at the institutional level, involving a somewhat macro approach.

A] At the Programme level

1. Specify for each academic programme considered at the Certificate / Diploma / Degree level (Undergraduate or Post-graduate level), the programme structure (core courses, optional courses, etc and their year wise distribution if applicable), entry level requirements, minimum and maximum duration for successful completion, programme objectives, teaching-learning strategies (number of teaching hours/lecture hours, tutorial hours, practical conduct hours, etc involved) and evaluation components (nature and number of assignments, tutorials, tests, etc.) for the entire programme. Identify also the modules / courses that may be studied either as part of the programme or may be taken up independently.
2. Given the syllabus to be considered under each course included in a given programme, specify the objectives of each course.
3. Break up the syllabus of each course into smaller components called 'Units' and state the Specific Learning Outcomes (SLO) for each Unit.
4. By and large, in a given year consider that on an average a learner may undertake courses totaling between 36 to 40 Credit Points (Taking into consideration that 1 Credit Point is equal to approximately 30 hours of study.)
5. Considering the nature of content to be studied for each course, number of lectures / practical's to be conducted and the evaluation components to be completed under each course, distribute the credit points among the different course components of the programme to be completed in a given year. As a thumb rule, each course should normally be in the range of 4 to 6 Credit Points.
6. Allocate the course wise credits based on an estimate of the number of hours that would be required by an average learner to fulfill the basic requirements of the course including time spent on attending lectures, preparing for all the evaluation components, etc.(Learning hours).

7. Credits should also be allocated to all the units included within a given course - for compulsory or core courses as well as elective courses.
8. Credits should also be allocated to project work, thesis, industrial placements, etc where these components are a part of a degree programme,

B] At the institutional level

1. Programme wise catalogues should be prepared in detail for all the academic programmes offered by the institution. Apart from basic information regarding admission procedure, fees to be paid, eligibility criteria, academic calendar and overall programme structure, each catalogue should contain other details like course choices available, course wise syllabi, course wise learning outcomes (what learners are expected to know, understand and be able to do after studying a given course) and workload (the time learners typically need to achieve the learning outcomes), expressed in terms of credits.
2. The programme wise catalogues thus prepared should be published in print form as well as made available on the web for open and transparent dissemination of information to all.
3. In addition to programme wise catalogues, certain other key documents will also be required viz. the Learning Agreement and the Transcript of Records in order to assist the process of Credit accumulation and Credit Transfer from one programme to another or from one institution to another [Specimen Formats of a Learning Agreement as well as Transcript of Records are provided in the Appendix and have been adapted from the European Credit Transfer System (ECTS) that has been accepted as a model by many countries across the globe.]

   When the three parties involved - the learner, the home institution and the host institution - agree about offering Credit Transfer facilities for a certain academic programme (especially in cases where in the learner completes some amount of course work in an overseas institution), they should sign a **Learning Agreement** which should be attached to an application form submitted by the learner. Such a Learning Agreement should specify that the learner agrees to undertake the programme of study at another 'host' institution as an integral part of his or her higher education. The 'home institution' according to this Agreement will also provide an assurance to the learner that the home institution will give full academic recognition in respect of the courses listed in the agreement. Ideally, the host institution should also explicitly state as to how exactly the academic recognition will be executed while confirming that the programme of study does not conflict with the host institution's rules. A copy of the signed learning agreement should be given to all parties involved, the home institution, the host institution and the learner.

   A **Transcript of records** should describe the learning achievements of the concerned learner prior to and after the period of study in another institution. Every course taken by the learner should be recorded on the transcript of records with the corresponding credits and the grade/marks awarded. A signed copy of the transcripts of records should be given to all parties involved, the home institution, the host institution and the learner.
4. An internal Coordination Committee should be established to handle all matters related to the implementation of the Credit System. Apart from assisting in inter-departmental

coordination, this Committee should also look into matters like inter-institutional credit transfer arrangements and course equivalence with the assistance of the concerned departments/officials from the university.

1.5 General Recommendations for Use of CBCS

There are general recommendations for the development and implementation of a Choice Based Credit System as follows

1. It is always advisable that credits are allocated on a "top-down" basis. The starting point should be the full programme taken into account and then one should move on to assigning credits to the constituent courses. Allocating credits to individual course units on a "bottom-up" basis may result in complications that are difficult to handle.
2. The use of decimals in course wise credit allocations (e.g. 4.85 credits) should be avoided. To the extent possible, unit wise credit allocations should be limited to the use of half credits.
3. Although credits may be allocated on a unit wise basis for computational purposes, they should only be awarded to learners who successfully complete the qualifying criteria for an entire course. In other words, learners should not be given credits for partial work completed for a given course like submission of assignments or attendance at tutorials, etc.
4. The mere existence of a facility for credit transfer should not by itself be a sufficient condition for making it available to the learner. The learner wanting to avail such a facility should apply for the same in a prescribed form with a certain 'processing fee' and also with adequate substantiating and properly authenticated documents accompanying his application.
5. In cases where in two or more institutions desire to give joint degrees/ diplomas, a Memorandum of Understanding should be signed specifying the particular responsibility of each partner in the Alliance and the operational modalities involved properly documented.

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Unit 2: Basic Concepts

2.1 Overview

In the last Unit, we have studied the rationale and advantages of introducing the Choice Based Credit System for any institution of higher education. While there is complete consensus among educationists and policy-makers about its need and importance, there is relatively less clarity about operationalising the system. The development of any comprehensive Choice-Based Credit System pre-supposes that there is complete conceptual understanding of the associated terms and their interpretation. These terms must not only be understood uniformly by all those using the system, but must also be well documented so as to facilitate provisions for learner mobility between two or more academic programs within a single institution or across educational institutions within and outside the country. A review of the Credit Systems operating in many parts of the globe does indicate some nationwise variations in terms of the numerical values assigned to a single Credit Point, but the conceptual meanings of the related terms remain uniform across the board. In this Unit, an attempt has been made to explain some of the concepts that are central to the Choice-Based Credit System. The reader is advised to apply some of these terms in his/her own context and refine his/her understanding of the same.

2.2 Some Key Terms

2.2.1 Program:

A Program is a set of courses that are linked together in an academically meaningful way and generally ends with the award of a Certificate or Diploma or Degree depending on the level of knowledge attained and the total duration of study. For example, Certificate in office Computing, Diploma in Journalism, BA and BSc , etc. would be called 'Programs' at the Certificate, Diploma and Degree level respectively. Over the years, most universities have been using the term 'Course' to indicate what is meant here by 'Program'. In **order to use common nomenclature, therefore, let us refer to BA, B.Sc and B.Com as Programs, not Courses.**

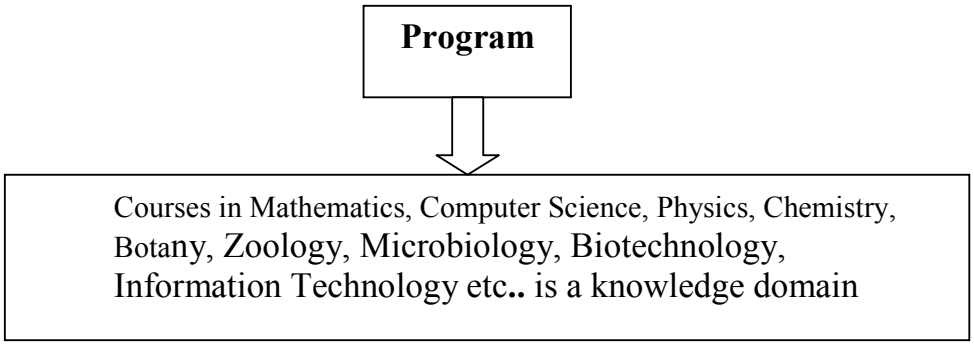
2.2.2 Course:

A 'course' in simple terms corresponds to the word 'subject' used in many universities. A course is essentially a constituent of a 'program' and may be conceived of as a composite of several learning topics taken from a certain knowledge domain, at a certain level. All the learning topics included in a course must necessarily have academic coherence, that is, there must be a common thread linking the various components of a course. A number of linked courses considered together are in practice, a 'program. For instance,

1. 'Compulsory English', 'General Marathi', ' Micro-Economics', etc. included under the BA program would be called 'Courses'

2. Chemistry, Physics, Mathematics, Zoology, Botany, Microbiology, Computer Science etc. included under the B.Sc. Programme would be called 'Courses' for single major Microbiology and Bio-Chemistry, Mathematics and Statistics, Zoology and Bio-Chemistry would be included under the B.Sc. program would be called 'Courses' for double major.

3. A B.Sc. program in Mathematics (as a single major) will include 18 courses from Mathematics, 10 courses from Computer Science, 4 courses from Physics, 4 courses from Applied component and 4 courses from Foundation Course and practical courses.



2.2.3 Module and Unit:

A course which is generally an independent entity having its own separate identity, is also often referred to as a 'Module' in today's parlance, especially when we refer to a 'modular curricular structure'. A module may be studied in conjunction with other learning modules or studied independently. While it is a common practice to treat a single course as an independent module, there are instances where in a single '**Unit**' or a Topic within a course is treated as a Module. For instance,

- One Topic in a course on 'Compulsory English' could be 'Reading Skills'. Such a topic would be called a 'Unit'. If this Unit can operate as a single separate entity, it may be called a 'Module'.
- One Topic in a course on 'Mathematics' could be 'Double integral'. Such a topic would be called a 'Unit'. If this Unit can operate as a single separate entity, it may be called a 'Module'.
- One paper in mathematics will be called one course. Thus in Mathematics at FYBSC level (Semester I and semester II) paper I will be called one module. Every paper in each subject under science faculty will be separate entity and hnce it is a course.

Structuring the entire curriculum of a program in terms of independent modules helps to provide a lot of flexibility and choice for the learner. He/She can then work out his own combination of courses as per his/her own inclinations.

2.2.4 Credit Point:

This has a reference to the 'Workload' of a learner and is an index of the number of learning hours deemed for a certain segment of learning. These learning hours may include a variety of learning activities like reading, reflecting, discussing, attending lectures / counseling sessions, watching especially prepared videos, writing assignments, preparing for examinations, etc.. Generally, a system of assigning Credit Points (CP) for a single course is practiced in most countries across the globe. Credits assigned for a single course always pay attention to how many hours it would take for an average learner to complete a single course successfully. The fallacy of assigning credits to a course purely based on how many lectures (teaching hours) are conducted for a learner at a certain level needs to be avoided. Although there is no hard and fast rule regarding how many credit points a single course should have, by and large a course may be assigned anywhere between 2 to 8 credit points wherein **1 credit is construed as corresponding to approximately 30 to 40 learning hours.**

2.2.5 Credit completion and Credit accumulation:

Each module of an academic program that has been assigned specific credit points also has a certain scheme of learner evaluation as well as certain specific criteria defining successful completion. Credit completion or Credit acquisition may be considered to take place after the learner has successfully cleared all the evaluation criteria with respect to a single course. Thus, a learner who successfully completes a 4 CP (Credit Point) course may be considered to have collected or acquired 4 credits. His level of performance above the minimum prescribed level (viz. grades / marks obtained) has no bearing on the number of credits collected or acquired. A learner keeps on adding more and more credits as he completes successfully more and more courses. Thus he 'accumulates' course wise credits.

2.2.6 Credit Bank:

The process of accumulating Credits over a period of time, leads to the idea of a 'Credit Bank'. Conceptually, a Credit Bank in simple terms refers to stored and dynamically updated information regarding the number of Credits obtained by any given learner along with details regarding the course/s for which Credit has been given, the course-level, nature, etc. In addition, all the information regarding the number of Credits transferred to different programs or credit exemptions given may also be stored with the individual's history. In short, like a regular Bank, this would involve maintaining all the Credit–related transactions of an individual. Credit Banking, when practiced would go a long way in facilitating credit transfers and learner mobility.

2.2.7 Credit Transfer:

Apart from maintaining an account of credits acquired by a learner over a period of time for a wide range of courses, the main idea behind implementing the credit system is to make provision for learner mobility. Credit Transfer means that credits earned at one institution for one or more courses under a given program are accepted under another program either by the same institution or another institution. In practice this means that it is accepted that a certain

chunk of learning has already been successfully completed by a learner. This acceptance of earlier acquired credits may be reflected in one of two ways:

(i) Direct Performance Transfer **or** (ii) Course exemption.

2.2.8 Performance transfer:

When a learner who has successfully completed a certain academic program, is allowed to transfer his past performance to another academic program having some common courses, ***performance transfer*** is said to have taken place. In such cases, the grades or marks obtained by the learner in the common courses of the earlier completed program are reflected unchanged in the new program. Thus for example, if two academic programs have 3 common courses, the grades (or marks) in each of them would be reflected in the same way when considering the new academic program. **For example B.A. and B. Sc. programme in Mathematics at FYBA and FYBSC has two courses in common, four courses in SYBA and SYBSC and eight courses in TYBA and TYBSC.**

2.2.9 Course exemption:

Occasionally, two academic programs offered by a single university or by more than one university may have some common or equivalent course-content. The learner who has already completed one of these academic programs is then allowed to skip these 'equivalent' courses when registering for the new program. He is then 'exempted' from 're-learning' the common or equivalent content area and from re-appearing for the concerned examinations. It is thus taken for granted that the learner has already collected in the past the credits corresponding to the exempted courses.

2.2.10 Block Transfer:

This refers to a group of courses, such as a completed certificate or diploma program that are accepted for transfer of credit into a degree program.

2.2.11 Shelf Life:

This has a reference to the time duration for which the content of a given course is relevant and is directly linked with the obsolescence of knowledge in a certain field. Some institutions have time limits for granting credit transfer. Courses with a short 'shelf life' are most common in areas such as Computer Science and Information Technology where dynamically updated curriculum is essential.

2.2.12 Transfer Agreement:

This is an agreement that must be made between two institutions (a sender and a receiver) that specifies how the sending institution's course or program will be accepted (for transfer of credits) at the receiving institution.

2.3 Dimensions of Credit Transfer

Credit Transfer may be conceived of as operating along two **planes: lateral (or horizontal)** and **vertical**. When an individual having successfully completed the courses included in an academic program at a certain level, is allowed to transfer his achievement in

some of these courses to another same-level academic program having these courses in common, this may be referred to as '**Horizontal or Lateral credit transfer'**. This would mean in practice that credit transfer takes place between two certificate level programs, two diploma level programs, two degree-level programs or two post-graduate level programs. **For example, a learner completing his B. Sc (Computer Science) degree from Mumbai University may seek Horizontal / Lateral Credit Transfer for the common courses while securing admission to the B.Sc (Bachelor in Information Technology) program in the same University. 'Vertical credit transfer',** sometimes referred to as **'Career Laddering'** may be said to occur when an individual's performance in some courses within a certain academic program at a particular level is carried over to a higher-level academic program having these or equivalent courses in common. Making a provision for 'upward mobility' of the learner is the rationale behind this dimension of credit transfer. An example of this would be when in a conventional university, a learner completing a Diploma program in Engineering gets direct admission to the Second Year in the Science degree program.

2.4 Types of Credit Transfer

Besides the fact that credit transfer may operate along either of the two above-mentioned planes, it may also be seen as being of one of two **types**: **intra-institutional** and **inter-institutional.** When the process of credit transfer takes place *within* a university or institution, it may be called intra-institutional credit transfer; on the other hand, when the credit transfer process operates *across two or more* institutions, this may be viewed as inter-institutional credit transfer. Both inter-institutional / intra-institutional credit transfer may operate across levels – vertical or horizontal. Thus, the following four possible combinations of credit transfer emerge:

2.4.1 Intra-institutional lateral credit transfer:

This would be illustrated if there is movement from one Diploma/Degree to another at the same level in the same or related field within the same university.

2.4.2 Intra-institutional vertical credit transfer:

An example of this is seen in the case of a learner from Mumbai University who after completing a 3-year Diploma in Computer Technology from MSBTE gets admission directly to the Second year of the B. Sc. programme (Refer to Ordinance)

2.4.3 Inter-institutional lateral credit transfer:

This would be illustrated in all cases of learners moving from one university to another for doing academic programs at the same level viz. two different Diplomas or two different Degrees, etc.

2.4.4 Inter-institutional vertical credit transfer:

This is best illustrated if a learner who completes one year of the Bachelor of Arts /Science program at say, Babasaheb Ambedkar Marathwada University, Aurangabad gets admission directly to the Second year of the degree program at Mumbai University.

By and large, when implementing the different types of Credit Transfer as stated above, a simple thumb rule would be to directly reflect the grades/marks obtained for one or more courses that have been successfully completed for all cases of Intra-institutional Credit Transfer. On the other hand, a convenient way to handle cases of Inter-Institutional Credit Transfer would be to grant Course Exemptions for the common or equivalent courses.

2.5 Issues to be addressed

Even though there are institutions as well as universities in the country that have implemented a Choice-Based Credit System, it must be recognized that there are issues that need to be handled through appropriate policy guidelines so as to ensure smooth implementation. Some of these are stated in the following.

- Need for using a common nomenclature e.g. 'Program', 'Course', for all the academic offerings of the university.
- Arriving at a common meaning of the term Credit in strict numerical terms.
- Extent of content equivalence expected between two or more courses before considering them for credit transfer arrangements.
- Amount of permissible time lapsed between the successful study of certain courses and the admission to courses/ programs for which transfer is sought.
- Need for a separate mechanism (e.g. Entrance test / Skill test) to ascertain whether after having completed a certain course sometime in the past, the learner has retained the minimum required level of knowledge / conceptual understanding / skill level before granting 'credit transfer'.
- Degree of 'openness' vs 'restricted entry' (like for instance, stipulating a minimum achievement level) to be exercised when considering vertical credit transfer.
- Need to evolve uniform definitions of terms like 'Certificate', 'Diploma' and 'Degree' level programs, both in terms of hours of study generally required as well as depth of content to be covered.
- Proportion of the total number of courses to be studied under a new program that may be given the benefit of past collection of credits. (i.e. maximum number of credit points that may be considered under Credit Transfer at any given point of time for a given program level.
- Role of contextual variables like learning facilities offered, teaching-learning approach adopted, evaluation strategy employed, etc when contemplating credit transfer possibilities.

These and other issues when worked out in detail will lead to the formulation of a full-fledged Credit Transfer Policy document that must be evolved by any university desirous of introducing the Choice-Cased Credit System. To sum up, it may, therefore, be emphasized that merely expressing courses offered in terms of Credit Points is not adequate for implementing the Choice-Based Credit System. Rather, a comprehensive exercise taking into account all the major implications of the system from the point of view of the learner must remain at the core of all activities in this regard.

Unit 3:

Curriculum Development Policy of University of Mumbai

3.1 Introduction

The University of Mumbai is one of the largest and oldest Universities in the country to impart various courses under different levels of programmes within the framework of higher education. As of now, there are more than 475 courses conducted through nine (09) levels of programmes in the University Department, recognized institutions and the affiliated colleges. These programmes have been designed by the concerned Board of Studies of the various faculties on the basis of the UGC guidelines and subsequently approved by the Academic Council and Management Council. Most of the programmes are conducted at the University Departments and some of the programmes are conducted at the affiliated colleges & recognized institutions. The examinations for the semesters I to IV (First and Second Year) of the UG programmes are conducted by the Colleges and Institutions on behalf of the University and the examinations for the remaining two semesters V & VI (Third Year) are conducted by the University. The examinations for all semesters of PG programmes are conducted by the University only. The examinations for other programmes at the certificate and diploma levels are conducted by the colleges and departments and the corresponding certificates are issued by the Vice Chancellor of the University of Mumbai.

3.2 Levels of the programmes

Sr. No.	Levels of Program	Nomenclature of Degree	Eligibility	Minimum Duration
1	Certificate / Foundation	Certificate in *	10+2	3 to 6 Months
2	Diploma	Diploma in *	10+2	6 Months to 1 Year
3	Advance Diploma	Advance Diploma in *	Undergraduate degree	1 year
4	Post Graduate Diploma	Post Graduate Diploma in *	Undergraduate degree	2 years
5	Under Graduate (UG)	Bachelor of *	10+2	3years
6	Post Graduate (PG)	Master of *	Undergraduate degree	2 years
7	Pre Doctoral	Master of Philosophy (M. Phil) *	Post Graduate Degree	2 years
8	Doctoral	Doctor of Philosophy (Ph.D.) *	Undergraduate/ Post Graduate degree	3 / 2 Years
9	Post Doctoral	D. Lit. *	Ph.D.	2years

*** Programmes from the respective faculties**

3.3 Programmes Available in the University of Mumbai under the Faculty of Science

The levels of the various programmes have been designed as per the UGC guidelines, the various programmes conducted at the various levels are shown below under the faculty of Science of the University of Mumbai.

Program

Sr. No.	Level	Nomenclatures of Degrees	Duration in Years	Eligibility Requirement
1	**Under Graduate**	B. Sc	3 Years	10+2 (HSC) Refer to ordinance
2		B. Sc(Information Technology)	3 Years	
3		B. Sc (Home Science)	3 Years	
4		B. Sc (Aviation)	3 Years	
5		B. Sc(Hospitality studies Arts) BSc(Maritime Hospitality studies)	3 Years	
6		B.Sc. (Aeronautics-Mechanical and Avionics)	3 years	
7		B.Sc.(Forensic Science)	3 years	
8	**Post Graduate**	M. Sc(By papers)	2 Years	Undergraduate Degree Refer to ordinance
9		M. Sc(By research)	2 Years	
10	Pre Doctoral	M. Phil.	1 Year	Postgraduate Degree Refer to ordinance
11	Doctoral	Ph. D	2 Years Minimum	Postgraduate Degree Refer to ordinance

Note

- For eligibility, refer to ordinances and regulations.
- Many other Diplomas, PG Diplomas & Certificate courses approved by the Academic Council as per the UGC guidelines under the faculty of Commerce are listed in the Catalogue published by the UG / PG section.

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Unit 4:

Assigning Course wise Credit: Steps for Implementation

4.1 General Overviews

The Credits are defined in terms of the learner's time spent in hours which are divided into two parts such as face to face instructions and Notional. The value of a particular course can be measured in number of Credit Points. The value of One Credit is equal to 30 to 40 learning hours.

The scheme of Examination shall be divided into two parts: Internal assessment and External assessment (semester end examination). Internal Assessment includes Assignments, Seminars, Case Studies, Quizzes, Viva, Open book test, Unit Tests etc..

Internal assessment	Semester end examination	Total (for each course or head of passing)
40 %	60 %	100%

The semester wise Credit Points will be varied from program to program but the total credits to be earned by learner to achieve Under Graduate Program degree shall be 120 Credits and for postgraduate it will be 96 credits.

Program	Sem. I	Sem. II	Sem. III	Sem. IV	Sem. V	Sem. VI	Total Credits
Undergraduate	20	20	20	20	20	20	120
Postgraduate	24	24	24	24			96

4.2 Credit Based Evaluation System

4.2.1. Scheme of Examination

The Scheme of Examination shall be divided into two components: Internal assessment and External assessment (semester end examination) for each course of the program. Internal Assessment includes Assignments, Seminars, Case Studies, Quizzes, Viva, Open book test, Unit Tests etc. For each course, there is a passing minimum for internal Assessment as 40% (16 out of 40 marks), for External / Semester End Examination 40% (24 out of 60 marks) and overall 40% (40 out of 100 marks).

The performance of the learner will be evaluated in each course in the following manner

Internal assessment	**Semester end examination**	**Total (for each course or head of passing)**
40 %	**60 %**	**100%**

The internal assessment of 40 % for each course will be as follows:

Courses with practical's (for Theory Component)

Sr. No	Evaluation type	Marks
1	Two Assignments/Case study/Project	20
2	One class Test (multiple choice questions objective)	10
3	Active participation in routine class instructional deliveries(case studies/ seminars//presentation)	05
4	Overall conduct as a responsible learner, manners, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.	05

Only for Course in Foundation Course I and Course II (For the Faculty of Arts, Science & Commerce)

Sr. No.	Particulars	Marks
1	One periodical class test/ case study / online examination to be conducted in the given semester	10 Marks
2	Assignment/project based on curriculum to be assessed by the teacher concerned. The student will have to submit the assignment/project before appearing for the Semester End Examination. Assignment will be entirely based on Unit 6 and can take the form of street-plays / exhibition/power-point presentation or similar other modes suitable to the topic selected. Students can work in a group of not more than 8 students for the purpose of assignment/project. Students will have to submit the hard copy of the assignment/project before appearing for the Semester End Examinations. The assignment will be evaluated for 20 marks of which 10 marks shall be allotted to Viva, to assess the level of engagement of the students with the topic concerned.	20 Marks
3	Active participation in routine class instructional deliveries	05 Marks
4	Overall conduct as a responsible learner, mannerism and articulation and exhibit of leadership qualities in organizing related academic actives	05 Marks

Practical's

Each practical course can be conducted out of 50 marks with 20 marks for internal and 30 marks for external

Practical's (Internal component of the Practical Course)

Sr. No	Evaluation type	Marks
1	Two best practical	10
2	Journal	05
3	Viva	05

Courses with tutorials (Mathematics):

Sr. No	Evaluation type	Marks
1	Two Assignments (one Tutorial converted into assignment) / Case studies / Project	20
2	One class Test [Tutorial converted into test]	10
3	Active participation in routine class instructional deliveries/Tutorials	05
4	Overall conduct as a responsible learner, mannerism and articulation and exhibit of leadership qualities in organizing related academic actives	05

The semester end examination (external component) of 60 % for each course will be as follows:

i) **Duration – 2 Hours**

ii) **Theory Question Paper Pattern**:-

1. There shall be four questions each of 15 marks. On each unit there will be one question and the fourth one will be based on entire syllabus.
2. All questions shall be compulsory with internal choice within the questions. (Each question will be of 20 to 23 marks with options.)
3. Question may be subdivided into sub-questions a, b, c… and the allocation of marks depend on the weightage of the topic.

The marks will be given for all examinations and they will be converted into grade (quality) points. The semester-end, final grade sheets and transcripts will have only credits, grades, grade points, SGPA and CGPA.

The following tables illustrate part (a) and (b) described above.

Chemistry theory (Sem. I and II)

		Assignment								
Paper/ Course	Cr	A1	A2	Unit Test	Seminar / Case Studies	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	6	8	29	30	59	6	A
II		6	7	7	8	28	45	73		

Chemistry practical (Each practical will be evaluated out of 50)

		Practical								
Paper	Cr	P1	P2	J	Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5	5	8/20	12/30	20/50		
I	2	4	4	5	3	16	20	36	7	O
II		4	5	4	4	17	25	42		

Mathematics theory and tutorial (Sem. I and II)

Paper	Cr	A1	A2 (Tut)	Unit Test (Tut)	Active Part. in Tut	Tut book	Internal 40	External 60	Total	Grade Point	Letter grade
	2+1	10	10	10	5	5	16/40	24/60	100		
I	3	7	8	7	4	4	30	30	60	5	B
II	3	6	7	9	4	4	30	28	58		

The assessment of part 'a' and (b) as mentioned above for the semester I to IV shall be processed by the Colleges / Institutions of their learners and issue the grade cards to them after the conversion of marks into grade as per the procedure mentioned in this manual.

The format of the grade card is given in Chapter 5 of this manual to maintain uniformity across all colleges for the examinations conducted by the colleges on behalf of the University.

The assessment of part 'a' as mentioned above for the semester V & VI shall be processed by the Colleges / Institutions of their learners admitted for the program while the University shall conduct for part (b) the Semester End Examination for semesters V & VI.

The Internal Assessment marks of learners appearing for semester V & VI shall be sent to the University by the respective colleges/ Institutions before the commencement of respective Semester End Examinations. The semester end examinations for semester V & VI shall be conducted by the University and the results shall be declared after processing the internal assessment and the marks awarded to the learners. The grade card shall be issued by the University after converting the marks into grades.

4.2.2 PASSING STANDARD AND PERFORMANCE GRADING:

PASSING STANDARD

"Passes" means minimum grade 'E' or above in 7 point scale
"Fails" means grade 'F' in 7 point scale

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment & Semester End Examination. The learners shall obtain minimum of 40% marks (i.e. 16 out of 40) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 24 Out of 60) separately, to pass the course and minimum

of Grade E in each project, wherever applicable, to pass a particular semester. A learner will be said to have passed the course if the learner passes the Internal Assessment & Semester End Examination together.

PERFORMANCE GRADING

The PERFORMANCE GRADING of a learner shall be on the SEVEN point ranking system as under:

Grade	Marks	Grade Points
O	70 & above	7
A	60 to 69.99	6
B	55 to 59.99	5
C	50 to 54.99	4
D	45 to 49.99	3
E	40 to 44.99	2
F (Fail/Unsatisfactory)	39.99 & below	1

The performance grading shall be based on the aggregate performance of Internal Assessment and Semester End Examination.

4.2.3 CARRY FORWARDS OF MARKS IN CASE OF A LEARNER WHO FAILS IN THE INTERNAL ASSESSMENT AND/OR SEMESTER END ASSESSMENT IN ONE OR MORE SUBJECTS:

1) A learner who PASSES in the Internal Examination but FAILS in the Semester End Examination of the course shall reappear for the Semester End Examination of that course. However his/her marks of the Internal Examinations shall be carried over and he/she shall be entitled for grade obtained by him/her on passing.

2) A learner who PASSES in the Semester End Examination but FAILS in the Internal Assessment of the course shall reappear for the Internal Examination of that course. However his/her marks of the Semester End Examination shall be carried over and he/she shall be entitled for grade obtained by him/her on passing.

3) **A) For Courses without practical's**

In case of a learner who is reappearing for the Internal Examination, the examination =will consist of one project of 40 marks which will be divided into 20 marks for the documentation of the project, 10 marks for the presentation and 10 marks for the viva and the interaction.

B) For Courses with practical, In case of learners who is reappearing for the internal Assessment of the Practical Course, the internal assessment

will consist of one project of 40 marks which will be divided into 20 marks for the documentation of the project, 10 marks for the presentation and 10 marks for the viva and the interaction and the marks thus obtained out of 40 will be converted to marks out of 20 (marks in decimal after conversion will be moved to the next integer).

4.2.4 ALLOWED TO KEEP TERMS (ATKT):

i) A learner shall be allowed to keep term for Semester II irrespective of grades obtained in each course of Semester I.

ii) A learner shall be allowed to keep term for Semester III if he/she passes (grade 'E' or above in each course) each of Semester I and Semester II

OR

He/she fails in not more than two courses of Semester I and Semester II taken together.

iii) A learner shall be allowed to keep term for Semester IV irrespective of grades obtained in each course of Semester III. However learner has to pass either of Semester I or Semester II in order to appear for Semester IV

iv) A learner shall be allowed to keep term for Semester V if he/she passes Semester I, Semester II, Semester III and Semester IV

OR

He/she has passed Semester I and Semester II and fails in not more than two courses of Semester III and Semester IV taken together

OR

He/she has passed Semester III and Semester IV and fails in not more than two courses of Semester I and Semester II taken together

v) A learner shall be allowed to keep terms for Semester VI irrespective of grades obtained in each course of Semester V.

vi) The result of Semester VI shall be kept in abeyance until the learner passes each of Semester I, Semester II, Semester III, Semester IV and Semester V.

4.2.5 ADDITIONAL EXAMINATION

A) INTERNAL ASSESSMENT:

Eligibility norms to appear for the additional class test or assignment for learners who remained absent:

a) The learner must apply to the Head of the Institution giving the reason(s) for absence within 8 days of the conduct of the examination along with the necessary documents and testimonials.

b) If the learner is absent for participation in Inter Collegiate events, State or National or International level events, Training camp or coaching camp organized by authorized university or state or national or international bodies, NSS / NCC Events / Camps / cultural activities / sports activities / research festival or any other activities authenticated by the head of the institution, the head of the Institution shall generally grant permission to the learner to appear for the additional class test or assignment.
c) The Head of the Institution, on scrutiny of the documents and testimonials, may grant the permission to the learner to appear for the additional examination.

Mode of conduct of Internal Assessment for Additional Examination

Class test or assignment for Internal Assessment:

1) A learner who is absent for the class test and the assignment/s will be declared fail in the Internal Assessment Scheme.
2) A learner who is absent for the class test and has appeared for the assignment/s will be allowed to appear for the additional class test of 10 marks.
3) A learner who has appeared for the class test but remains absent for the assignment/s will be allowed to appear for one additional assignment out of 10 marks and the internal assessment will be calculated as out of 40 marks.
4) A learners who is absent for the class test or one assignment as the case may be the learner will be allowed to appear for the additional class test/assignment and the internal assessment will be calculated as out of 40 marks.

The Additional Class Test or Assignment must be conducted 15 days prior to the commencement of the Semester End Examination after following the necessary procedure and completing the formalities.

B) SEMESTER END EXAMINATIONS

ELIGIBILITY TO APPEAR FOR ADDITIONAL SEMESTER END EXAMINATION:

A learner who does not appear i.e. remains absent in some or all the courses on medical grounds or for representing the college / university in sports, cultural activities, activities of NSS, NCC or sports training camps conducted by recognized bodies / competent authorities or for any other reason which is considered valid under exceptional circumstances and to the satisfaction of the Principal or the Head of the Institute OR fails n some or all the subjects is eligible to appear for the additional examination.

A learner who does not appear for both the Internal Assessment and Semester End Examination shall not be eligible to appear for the additional Semester End Examination.

The additional Semester End Examination shall be of two hours duration and of 60 marks per course. The learner shall appear for the course of the Semester End Examination for which he/she was absent or has failed. Learners who are punished under O.5050 are not eligible to appear for this additional examination.

MODE OF CONDUCT OF SEMESTER END ADDITIONAL EXAMINATION:

a) There will be one additional examination for semester I, II, III and IV only for those who have failed or remained absent.
b) The absent learner will be allowed to appear for the examination by the head of the institution after following the necessary formalities subject to the reasons to the satisfaction of the head of the institution.
c) This examination will be held 20 days after the declaration of results but not later than 40 days.

4.2.6 Evaluation of Projects (Where ever Applicable)

i) A learner who passes in all the theory papers but does not secure minimum grade 'E' in project as applicable has to resubmit a fresh project till he/she secures a minimum grade 'E'. His/her marks and/or grades in the theory papers that the learner has passed will be carried forward but he/she shall be entitled for grade "E" on passing.

ii) The evaluation of project and viva-voce examination shall be by awarding grade in the seven point scale as given in (1) above.

iii) A learner shall have to obtain minimum of grade 'E' (or its equivalent marks) in project evaluation and viva/voce taken together. i.e. 40% marks in project work.

Subject where there are more than one papers/courses, the credits and grade will be awarded only when he/she obtains grade 'E' or above in seven point scale in each of the paper/course. The course in which grade 'E' or above is obtained, the credits of that course will be carried forward and will be put in credit bank till he/she gets grade 'E' or above in papers/paper in which learner has failed to get minimum grade 'E'.

4.2.7 Calculations of GPA & SGPA

4.2.7.1 Grading and Average (GPA Calculation)

Semester Grade point Average (SGPA):- Each Semester grade point average is calculated by diving the total of Product of grade (quality) point and course credit by sum of all course credits in a semester.

$$SGPA = \frac{\sum CG}{\sum C} \quad \text{for a semester.}$$

Where G is grade and C is credit for paper / course.

4.2.7.2 Cumulative Grade Point Average (CGPA) for the Entire Course

$$CGPA = \frac{\sum CG}{\sum C} \quad \text{for all semesters taken together.}$$

Note:-

- The total credits cover the core, elective, field work or extension activities, soft skills etc..
- GPA is calculated at the end of each term after grades have been processed and after any grade have been updated or changed.
- Same criteria are to be followed for Individual assignment / Quizzes / Test / Unit Test / Tutorials / Practical / Projects/ Seminar.
- The teacher should convert his/ her marking in to the quality points/ grade points and letter grade.

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Unit 5

Introduction of the Grading System in University of Mumbai

5.1 Introduction:

The intellect, physique, emotions, ethics and aesthetics are some of the aspects of the learner's personality. The development in all these aspects should be taken care of for proper progress and career development. Each of these aspects is complementary to one another and therefore it is necessary to pay attention to the simultaneous development of each. A well designed evaluation system attempts to integrate all these aspects, with due attention to their relative importance in the context of any given academic programme.

The examination system has its existence since time immemorial. It has also been recognized as one of the most debatable features of the Indian education system since nearly half a century. The magnitude of the problems associated with Examinations has been growing at an alarming rate and it has in fact become one of the biggest challenges for the academic administrators and policy makers to create a transparent, fair and objective system that is self-sustaining. Unfortunately, although recommendations regarding Examination Reforms have been made from time to time, nothing substantial has yet appeared on the scene by way of implementation.

Curriculum design, teaching-learning and evaluation are the three important parameters of the educational system. The relationship between them is intimate and Evaluation plays an important role so that any improvement in this parameter automatically results in the improvement of others. Several commissions & committees had been constituted in the past to deliberate on the issue of Examination Reforms e.g. the University Education Commission (1948-49), the Mudaliar Commission (1952-54), the Education Commission (1964-66), the Council of Board of Secondary Education (1981), the NCERT (1987), Ramamurthy Committee (1990). Their reports have also been submitted and yet, the higher education system in the country has so far shown resistance to long-term reform in the system. One of the major recommendations made by all these Commissions and Committees is the introduction of the Grading system in place of the marking system.

5.2 What is Grading?

The word Grade is derived from the Latin word *gradus,* meaning, step. Grading, in the educational context is a method of reporting the result of a learner's performance subsequent to his evaluation. It involves a set of alphabets which are clearly defined and designated and uniformly understood by all the stake holders. A properly introduced grading system not only provides for a comparison of the learners' performance but it also indicates the quality of performance with respect to the amount of efforts put in and the amount of knowledge acquired at the end of the course by the learners.

5.3 Encumbrances to Evaluations Reforms

The issues related to examination and evaluations do not have any state or national boundaries, but are global in nature. It is accepted by all the stakeholders that our educational system is examination ridden. The declaration of examination results with award of marks and class has become of paramount importance for all the stakeholders in the system. In many cases, once the results are out, there is no scope for improvement in marks or performance improvement. This results in a lot of students being deprived from further opportunities. In spite of the repeated regulations and reminders from the UGC and similar continuous follow up from the state government to implement some reforms in the examination system, the fact remains that most universities and higher education institutions have not adopted the same.

Some reasons for the delay in implementation of reforms in the academic and examination system are as follows:-

1) Unfortunately, a large section of the society suffers from inertia and is, therefore, reluctant to accept any change.

2) The new system which is planned for implementation has not been clearly explained.

3) Most of the teachers, academic administrators and community at large are inattentive to the intricate technicalities of examinations which affect their reliability, validity & objectivity.

4) There are vested interests that perpetuate the existing practices.

5) Additional time is required to prepare proper guidelines and manuals so as to enable the various stakeholders in understanding the new system.

5.4 Deficiencies in the Traditional Marking System

Learners' Evaluation is the process of collecting, analyzing and interpreting the evidences to judge the level of performance performed by the individual learner or a group of learners for the purpose of making the decision of achievement level. The prevailing practice of evaluation of learners that has been in existence since long involves evaluating the performance of an individual or group of individuals at the end of an academic year within a stipulated time. The learners are often required to express their understanding or mastery over the content included in their curriculum for a complete year within a span of three hours and their efforts over the year are often completely ignored. The present system of evaluation also does not provide for the application of multiple techniques of assessment of the learner's performance in a valid and reliable way. Apart from the several ills that prevail in the examination system through inappropriate testing methods and tools, the current practice of awarding numerical marks for reporting the performance of learners suffers from several drawbacks and is a source of a variety of errors. Further, the problem gets compounded due to the variations in the marks awarded in different subjects. The 'raw score' obtained by the learner, is, therefore, not a reflection of his true ability.

Our aim to assess the learner's true ability is not being served by the current practice of evaluation. Excellence in quality education can be achieved by evaluating the true ability of the learners with the help of continuous evaluation. **Some deficiencies in the present marking system are listed as follows:-**

1) A difference of one mark is an unrealistic indication of difference in ability. Calibrating students on a 101 point scale (0 to 100) as required in the marking system cannot be objectively achieved.
2) Judgmental bias reflected in the assessment of learners, particularly in the subjective type of answers results in subjectivity in marking.
3) The score of zero which is artificially created for the convenience of the user does not represent zero ability.
4) The score of hundred does not reflect perfection in performance.
5) Marks tend to be unreliable as a consequence of subjectivity due to inter and intra-examiner variability.
6) The magnitude of the subjective errors in marking is reported to vary from ten to twenty five (10-25) percentages.
7) Marks obtained in the examinations are considered as the yardstick of the quality of performance which is very sacrosanct for the society.
8) The marks awarded by examiners are often affected by many factors such as unfair means, erratic marking, and subjectivity of the examiners, etc.
9) It is unfair to label a student as 'pass' or 'fail' on the basis of such unreliable evaluation.
10) The 'pass' or 'fail' system often results in promoting corrupt practices besides being discriminatory.

5.5 Advantages of Grading System

In view of the deficiencies mentioned above, it is desirable that the marking system used for the declaration of results is replaced by the grading system. According to the grading system, students are placed in ability bands that represent a range of scores. These ability bands may vary according to the number of categories for the classification of the performance of the learners. This ability range may be designated with alphabetical letters called as GRADE. The system of awarding grades would provide a more realistic picture of learner's ability than the prevailing marking system.

However, before we go in for the introduction of grades in place of marks, let us be very clear about one thing. Each method of reporting student performance –marks or grades has its own set of problems and limitations. However, this should not prevent the efforts to use a more scientific and reliable system so as to minimize the shortcoming and difficulties. Due to the superiority of the grading system over the conventional marking system, several premier institutions and universities of high repute in India as well as abroad have introduced it successfully. **There are several advantages of the grading system; some of them are listed below:**

1) Grading is a far more satisfactory method than the numerical marking system as it reflects an individual learner's performance in the form of a certain level of achievement in relation to the whole group of learners.

2) The Grading system ensures natural classification in qualitative terms rather than quantitative terms since it expresses a range /band of scores to which a student belongs such as O, A, B etc….
3) The award of grades provides a permanent record of the learner's growth and development that might be helpful for institutions of higher education for allocating seats for prospective employers.
4) It may be very helpful for the institutions itself in making a kind of decisions pertaining to placement and promotions.
5) Grading does not require making fine distinctions in performance when no such distinctions actually exist.
6) It is based on a realistic concept of 'errors of measurement'.
7) Grades are relatively free from extraneous factors like difficulty of the examination, examiner bias, nature of the subject being examined, etc.
8) Grades can be interpreted easily and directly and can be used to prepare an accurate 'profile' of a student'.
9) The system of assigning Grades as opposed to giving Marks will help the creation of healthy competition among students since the rat race for obtaining marks will be eliminated. This will indirectly contribute to relieving the students from undue tension and pressure that may occasionally lead to suicides, trauma, etc.

5.6 The Seven Point Grading System

Grading may be carried out in a variety of ways. The classification of grades depends upon the reference point. Grading may be classified in terms of direct grading and indirect grading when the reference point is 'Approach', whereas it can be classified as Absolute and Relative grading when the reference point is 'Standard of judgment'. The grading systems used in the world generally vary from the Five point grade system to the Nine point grade system.

When the performance exhibited by the examinees is assessed in qualitative terms and the impressions so obtained by the examiners are directly expressed in terms of letter grades, it is called, 'Direct Grading'.

When the performance displayed by the examinees is first assessed in terms of marks and subsequently transformed into letter grades by using different modes, it is called, 'Indirect Grading.

The method that is based on a predetermined standard which becomes a reference point for the learner's performance is called 'Absolute Grading'. This involves direct conversion of marks into grades irrespective of the distribution of marks in a subject. This method of grading has several advantages such as, the procedure is simple and straightforward to use, each grade is distinctly understandable, the learner has the freedom to strive for the attainment of the highest possible grade and it enables the students to know their strengths and weaknesses. The limitations in this method are that the distribution of scores is taken at its face value regardless of the errors of measurement creeping in due to various types of subjectivity. Besides, the cut-offs of different categories are also arbitrarily decided.

Relative Grading is popularly known as grading on the curve. The curve refers to the normal distribution curve or some symmetric variant of it. This method amounts to determining in advance approximately what percentage of students can be expected to receive different grades, such as A_s, B_s, C_s….. In this grading system the grade is not determined by the learner's performance but on the basis of group performance.

The Absolute Grading system of Seven (07) Points is the most popular grading system and has also been accepted by the UNESCO (United Nations Educational, Social & Cultural Organization). The Mumbai University has already decided and resolved in its Academic Council and subsequently in the meeting of the Management Council meeting to implement the grading system with minor changes in the academic year 2010-11. Therefore, a series of meetings of all the Deans & Controller of Examinations was organized by the Hon'ble Vice Chancellor and it was unanimously decided that the overall structure of the **Seven (07) Points Grading System** shall be adopted for the University of Mumbai which is as follows:-

Grade	Marks	Grade Points
O	70 & above	7
A	60 to 69.99	6
B	55 to 59.99	5
C	50 to 54.99	4
D	45 to 49.99	3
E	40 to 44.99	2
F (Fail)	39.99 & below	1

Note: - Consider 1 Grade Point is equal to Zero for CG calculations of failed learner/s in the concerned course/s.

5.7 Conversion of Marks to Grades and Calculations of GPA (Grade Point Average)

In the Credit and Grade Point System, the assessment of individual Courses in the concerned examinations will be on the basis of marks only, but the marks shall later be converted into Grades by some mechanism wherein the overall performance of the Learners can be reflected after considering the Credit Points for any given course. However, the overall evaluation shall be designated in terms of Grade. There are some abbreviations used here that need understanding of each and every parameter involved in grade computation and the evaluation mechanism. The abbreviations and formulae used are as follows:-

5.7.1 Abbreviations and Formula's Used:-

G: Grade

GP: Grade Points

C: Credits

CP: Credit Points

CG: Credits X Grades (Product of credits & Grades)

∑CG: Sum of Product of Credits & Grades points

∑C: Sum of Credits points

$$SGPA = \frac{\sum CG}{\sum C}$$

SGPA: Semester Grade Point Average shall be calculated for individual semesters. (It is also designated as GPA)

CGPA; Cumulative Grade Point Average shall be calculated for the entire Programme by considering all the semesters taken together.

While calculating the CG the value of Grade Point 1 shall be consider Zero (0) in case of learners who failed in the concerned course/s i.e. obtained the marks below 40.

After calculating the SGPA for an individual semester and the CGPA for entire programme, the value can be matched with the grade in the Grade Point table as per the Seven (07) Points Grading System and expressed as a single designated GRADE such as O, A, B, etc….

5.7.2 Illustrations of Calculation:-

The illustration for the conversion of marks into grades in theory & practical, if any in individual courses are as shown below:-

1) Pass in all the courses with more than 40 marks

Courses in the semesters	Marks * Obtained	Grade	Grade Points (G)	Credits (C) per Course	Σ CG = (C x G)	SGPA = ΣCG/ ΣC
Course - I	55	B	5	4	20	103/20 = 5.15
Course – II	60	A	6	4	24	
Course – III	70	O	7	4	28	
Course – IV	80	O	7	3	21	
Course – V	40	E	2	3	06	
Course - VI	45	E	2	2	04	
Passes Credit Earned = 20				ΣC =20	ΣCG =101	Grade = B

2) Failed in two courses & passed in three courses

Courses in the semesters	Marks * Obtained	Grade	Grade Points (G)	Credits (C) per Course	Σ CG = (C x G)	SGPA = ΣCG/ ΣC
Course - I	42	E	2	4	08	
Course – II	*28*	F	1	4	00	
Course – III	40	E	2	4	08	
Course – IV	32	F	1	3	00	***34/20 = 1.7***
Course – V	52	C	4	3	12	
Course - VI	48	D	3	2	06	
FAIL ***Credit Earned = 13***				ΣC =20	ΣCG =34	***Grade = F***

*: the marks indicated above are after implying the Gracing Criterion.

Note: - Consider 1 Grade Point is equal to Zero for (C x G) Calculations of failed learner/s in the concerned course/s.

5.8 Reporting of Learners Performance (Grade Card)

The grade cards can be issued to the Learners on the basis of the above calculations in a uniform format given by the University. The format of the grade card for the examinations conducted by the colleges shall be the same as the format for all the concerned Programmes wherein the emblem of the University shall be printed on the right side & the emblem of the college will be on the left side of the face of the Grade Card. The Principal of the affiliated colleges and Director of the recognized institutions only will be authorized to sign the grade cards for the examinations conducted by Colleges / Institutions on behalf of the University in case of semesters I to IV. The grade cards of the Examinations conducted by the University shall be signed by the Controller of Examinations only as per the provision in the University Act.

The grade card will reflect the marks obtain by the learner, Credit points of the individual Course as well as Semester, conversion of marks into grades, calculation of SGPA for each individual semester and the CGPA for the complete Programme at the end of the final semester.

The grade card shall be issued with SGPA & Grade in case of middle semesters or CGPA & Grade in case of final semester only to those learners who have completed all the courses & semesters of that programme successfully. However, the learners those who are unsuccessful or carry the courses under ATKT rule will not get the SGPA & Grade in case of middle semesters or CGPA & Grade in case of the final semester unless and until they successfully complete their pending courses or semesters under the concerned programme. The credits points earned or accumulated will be shown on the grade card only. The calculation of SGPA for two-three cases is shown above in the illustrations and the format of grade card will be as per the given format.

Illustration 1

Student's performance in semester I with courses in Chemistry, Physics, Botany and Foundation course is as follows

Chemistry theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	8	6	29	30	59	6	A
II		6	7	8	7	28	45	73		

Chemistry practical

		Practical										
Course	Cr	P1	P2	J			Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5			5	8/20	12/30	20/50		
I	2	4	4	5			3	16	20	36	7	O
II		4	5	4			4	17	25	42		

Physics theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	6	6	7	5	24	32	56	6	A
II		5	7	6	7	25	39	64		

Physics practical

		Practical										
Course	Cr	P1	P2	J			Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5			5	8/20	12/30	20/50		
I	2	5	3	4			4	16	19	35	7	O
II		4	5	5			5	19	21	40		

Botany Theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	8	6	29	36	65	7	O
II		6	7	7	7	27	50	77		

Botany Practical

		Practical										
Course	Cr	P1	P2	J			Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5			5	8/20	12/30	20/50		
I	2	5	4	4			4	17	19	36	7	O
II		4	5	5			5	19	21	40		

Foundation Course I

		Assignment										
Course	Cr	A1	A2	A3			Unit Test	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10			10	16/40	24/60	100		
I	2	6	5	6			3	20	30	50	4	C

University of Mumbai

ABC COLLEGE OF ARTS, SC & COM

(Affiliated to University of Mumbai)

B- Road, CHURCHGATE, MUMBAI-400 020, M.S. (INDIA)

GRADE CARD

COLLEGE LOGO

PROGRAMME: Bachelor of Science (B. Sc.) **SEMESTER: - I**

Photo

Examination Seat No.	Name of the Candidates	Month & Year of Examination
1	A. B. C. D.	October, 2011

Course Code	Course Title	Marks Obtained		Marks (100)	Grades	Grade Points	Credits Points	CG = C x G	GPA = ∑CG / ∑C
		Int. Asst (40)	Sem. End (60)						
USFCT01	Foundation Course	18	32	50	C	4	2	8	
USCHT01	Chemistry Theory	19	40	59	A	6	4	24	
USCHT02		20	53	73					
USCHP01	Chemistry Practical	30	48	78	O	7	2	14	126/20 = 6.3
USPHT01	Physics Theory	16	40	56	A	6	4	24	
USPHT02		20	44	64					
USPHP01	Physics Practical	30	45	75	O	7	2	14	
USBOT01	Botany Theory	20	45	65	O	7	4	28	
USBOT02		27	50	77					
USBOP01	Botany Practical	30	46	76	O	7	2	14	
							Σ C = 20	Σ CG = 126	Grade = A
Remarks : PASS			Credit Earned : 20			SGPA = 6.3			

Result Declared on: 24th January, 211 **Chairperson (Exam)** **PRINCIPAL**

Illustration 2

Courses/Subjects offered by (361-2102) are Chemistry, Physics, Botany and Foundation course I

Chemistry theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	8	6	29	9	38	1	F
II		6	7	8	7	28	45	73		

Remarks: Student will appear in Course I external component

Chemistry practical

		Practical								
Course	Cr	P1	P2	J	Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5	5	8/20	12/30	20/50		
I	2	4	4	5	3	16	20	36	7	O
II		4	5	4	4	17	25	42		

Physics theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	6	6	7	5	24	32	56		
II		5	7	6	7	25	12	37		F

Remarks: Student will appear only in Course II external component.

Physics practical

		Practical								
Course	Cr	P1	P2	J	Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5	5	8/20	12/30	20/50		
I	2	5	3	4	4	16	19	35	7	O
II		4	5	5	5	19	21	40		

Botany Theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	8	6	29	36	65	7	O
II		6	7	7	7	27	50	77		

Botany Practical

		Practical										
Course	Cr	P1	P2	J			Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5			5	8/20	12/30	20/50		
I	2	5	4	4			4	17	2	19		F
II		4	5	5			5	19	21	40		

Remarks: Student will appear only in Course I practical external component.

Foundation Course I

		Assignment										
Course	Cr	A1	A2	A3	T2	T3	Unit Test	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10			10	16/40	24/60	100		
I	2	6	5	6			3	20	30	50	4	C

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GRADE CARD

COLLEGE LOGO

PROGRAMME: Bachelor of Science (B. Sc.) **SEMESTER: - I**

Photo

Examination Seat No.	Name of the Candidates	Month & Year of Examination
1	A.B.C.D.	October, 2011

Course Code	Course Title	Marks Obtained		Marks (100)	Grades	Grade Points	Credits Points	CG = C x G	GPA = ∑CG / ∑C
		Int. Asst (40)	Sem. End (60)						
USFCT01	Foundation Course	18	32	50	C	4	2	8	50/20 = 2.5
USCHT01	Chemistry Theory	19	19	38	F	1	4	00	
USCHT02		20	53	73					
USCHP01	Chemistry Practical	30	48	78	O	7	2	14	
USPHT01	Physics Theory	16	14	30	F	1	4	00	
USPHT02		20	44	64					
USPHP01	Physics Practical	30	45	75	O	7	2	14	
USBOT01	Botany Theory	20	08	28	F	1	4	00	
USBOT02		27	50	77					
USBOP01	Botany Practical	30	46	76	O	7	2	14	
							Σ C = 20	Σ CG = 50	Grade = F
Remarks : ATKT			Credit Earned : 08			SGPA = 2.5			

Result Declared on: 24th January, 211 **Chairperson (Exam)** **PRINCIPAL**

Illustration 3 (361-2103)

Chemistry theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	8	6	29	21	50		F
II		6	7	8	7	28	45	73		

Remarks: Student will appear in Course I external component

Chemistry practical

		Practical								
Course	Cr	P1	P2	J	Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5	5	8/20	12/30	20/50		
I	2	4	4	5	3	16	20	36	7	O
II		4	5	4	4	17	25	42		

Physics theory

		Assignment								
Paper /Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	6	6	7	5	24	32	56		
II		5	7	6	7	25	12	37		F

Remarks: Student will appear only in Course II external component.

Physics practical

		Practical								
Course	Cr	P1	P2	J	Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5	5	8/20	12/30	20/50		
I	2	5	3	4	4	16	Abs	16	7	F
II		4	5	5	5	19	Abs	19		

Botany Theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	8	6	29	36	65	7	O
II		6	7	7	7	27	50	77		

Botany Practical

		Practical										
Course	Cr	P1	P2	J			Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5			5	8/20	12/30	20/50		
I	2	5	4	4			4	17	20	37	7	O
II		4	5	5			5	19	21	40		

Foundation Course I

		Assignment										
Course	Cr	A1	A2	A3	T 2	T 3	Unit Test	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10			10	16/40	24/60	100		
I	2	6	5	6			3	20	30	50	4	C

Illustration 4

Student's performance (361-2102) in Semester I in additional examination is as follows

Chemistry theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	8	6	29	31	60	6	A
II		6	7	8	7	28	45	+73		

Chemistry practical

		Practical								
Course	Cr	P1	P2	J	Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5	5	8/20	12/30	20/50		
I	2	4	4	5	3	16	20	+36	7	O
II		4	5	4	4	17	25	+42		

Physics theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	6	6	7	5	24	32	+56	5	B
II		5	7	6	7	25	35	60		

Physics practical

		Practical								
Course	Cr	P1	P2	J	Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5	5	8/20	12/30	20/50		
I	2	5	3	4	4	16	19	35	7	O
II		4	5	5	5	19	21	40		

Botany Theory

		Assignment								
Course	Cr	A1	A2	Seminar / Case Studies	Unit Test 10	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10	10	16/40	24/60	100		
I	4	7	8	8	6	29	36	65	7	O
II		6	7	7	7	27	50	77		

Botany Practical

		Practical										
Course	Cr	P1	P2	J			Viva	Internal 20	External 30	Total 50	Grade Point	Letter grade
		5	5	5			5	8/20	12/30	20/50		
I	2	5	4	4			4	17	13	30	7	O
II		4	5	5			5	19	21	+40		

Foundation Course I

		Assignment										
Course	Cr	A1	A2	A3	T 2	T3	Unit Test	Internal 40	External 60	Total	Grade Point	Letter grade
		10	10	10			10	16/40	24/60	100		
I	2	6	5	6			3	20	30	50	4	C

Unit-6

Programmes Under the Faculty of Science along with the assignment of Credits

Title of the Programme: - Bachelor of Science (B.Sc.) Degree Programme
Structure of the Programme with Credit System

To obtain under graduate degree in science learner will have to choose Courses from physical science, biological science, social science, applied component and foundation course group. The physical science group includes Mathematics, Statistics, Computer science, Geology, Physics, Chemistry and Biological science group includes Botany, Zoology, Microbiology, Biochemistry, and Biotechnology. There are 23 different courses under applied component group and 2 courses under foundation course. [Refer to ordinances and regulations]

The number of subjects and courses to be taken by learner at first year, second year and third year is given in the following table. S1, S2, S3 are subjects from physical, biological or social science group as per the combination of subjects allowed in ordinance and regulations for admission to the first year BSc programme. FC is foundation course.

Year	Semester	Subject	Courses with practicals	Credits Theory	Practical	Total		
First	I	S1	2	4	2	6		
		S2	2	4	2	6		
		S3	2	4	2	6		
		FC	1	2		2		
	II	S1	2	4	2	6		
		S2	2	4	2	6		
		S3	2	4	2	6		
		FC	1	2		2		

In the second year learner will select any two subjects from the subjects he/she has offered in first year. Assuming that student has offered S1 and S2 subjects

Year	Semester	Subject	Courses with practical's	Credits Theory	Practical	Total		
Second	III	S1	3	6	3	9		
		S2	3	6	3	9		
		FC	1	2		2		
	IV	S1	3	6	3	9		
		S2	3	6	3	9		
		FC	1	2		2		

In the third year learner will select any one/two subjects from the subjects he/she has offered in second year. Assuming that student has offered S1 subject

Year	Semester	Subject	Courses with practical's	Credits Theory	Practical	Total		
Third	V	S1	4	10	6	16		
		AC	2	2	2	4		
	VI	S1	4	10	6	16		
		AC	2	2	2	4		

The credits earned by learner in duration of three year undergraduate programme in different disciplines is shown in the following table assuming that student has offered Chemistry, Mathematics, Physics and Foundation course at first year and Chemistry, Physics and Foundation course in second year and Chemistry and Applied Component in third year.

Year	Sem	Chemistry		Physics		Mathematics		FC	AC		Total
		Th	Pr	Th	Pr	Th	Tut	Th	Th	Pr	
1	I	4	2	4	2	4	2	2	-	-	20
	II	4	2	4	2	4	2	2	-	-	20
2	III	6	3	6	3	--	--	2	-	-	20
	IV	6	3	6	3	--	--	2	-	-	20
3	V	10	6	-	-	--	--	-	2	2	20
	VI	10	6	-	-	--	--	-	2	2	20
Total		40	22	20	10	8	4	8	4	4	
		62		32		12		8	8		120

The credits earned by learner in duration of three year undergraduate programme in different disciplines is shown in the following table assuming that student has offered Chemistry, Mathematics, Physics and Foundation course at first year and Chemistry, Physics and Foundation course in second year and Chemistry and Physics and Applied Component in third year.

Year	Sem	Chemistry		Physics		Mathematics		FC	AC		Total
		Th	Pr	Th	Pr	Th	Tut	Th	Th	Pr	
1	I	4	2	4	2	4	2	2	-	-	20
	II	4	2	4	2	4	2	2	-	-	20
2	III	6	3	6	3	--	--	2	-	-	20
	IV	6	3	6	3	--	--	2	-	-	20
3	V	5	3	5	3	--	--		2	2	20
	VI	5	3	5	3	--	--		2	2	20
Total		30	16	30	16	8	4	8	4	4	
		46		46		12		8	8		120

Acknowledgement

I take this opportunity to thank all the members of Faculty of Science, Principals, Heads of University Departments and college teachers whose suggestions were helpful in brining logical consistency in write up. Special thanks to Dr. Anuradha Deshmukh for giving scientific thought for credit system and Hon'ble Vice Chancellor Dr. Rajan Welukar who encouraged all the times.

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