BHARATI VIDYAPEETH UNIVERSITY, PUNE (INDIA)
BACHELOR OF COMPUTER SCIENCE
(B.Sc. Computer Science)
(CBCS 2018 Course)
Under: Faculty of Science
(To be implemented from June 2018)

The B.Sc.(Computer Science) Degree Course is of three years duration divided into six semesters. The structure of the course and syllabus of the first year will come into effect from the academic year 2018-2019.The second and third year syllabus will be implemented from 2019-2020and 2020-2021 respectively.

1. **Objectives: B.Sc. (Computer Science) Course:**

   1. To develop problem solving abilities using a computer

   2. To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems

   3. To imbibe quality software development practices

   4. To create awareness about process and product standards

   5. To train students in professional skills related to Software Industry

   6. To prepare necessary knowledge base for research and development in Computer Science

   7. To help students build-up a successful career in Computer Science

2. **Rules & Regulations for B. Sc. (Computer Science) Course**

Eligibility for Admission to B.Sc. (Computer Science) Course:

i. A candidate who has passed the Higher Secondary School Certificate Examination of the Maharashtra State Board or Higher Secondary Examination of its equivalent of any other statutory Board or University and has passed in English and in two Science subjects (i) Physics (ii) Mathematics shall be eligible for admission to the First year B.Sc (Computer Science) Degree course.

ii. Candidate who has passed H.S.C. examination (10+2) with English, Mathematics and any one of the following vocational subjects is also eligible for admission to the F.Y.B.Sc. (Computer Science) course.

Subject code	Subject
97	Information Technology
D9	Computer Science
C2	Electronics
J1/J2/J3	Electronics Technology

iii. Also student who has completed Diploma course in Engineering (Polytechnic) Computer Science, Electronics and Information Technology or its equivalent examination recognized by MBTE, Mumbai or its equivalent of any other statutory Board or University.

3. **Admission process:**

- Admissions will be given as per the selection procedure/policies adopted by the college, in accordance with conditions laid down by Bharati Vidyapeeth University, Pune.
- Reservation and relaxation will be as per the Government rules and Bharati Vidyapeeth University, Pune.

4. Intake Capacity:

Intake capacity of the students for this course at the entry level will be 80 per year.

5. Course Structure of B.Sc. (Computer Science) Degree Programme and scheme of credits

Course Structure and Scheme of Credits:

Course	Semester	Credits	Total of Semester	Grant Total of the year
F.Y.B.Sc. (Computer Science)	I	Theory (Core) - 18	30	62
		Practical – 06		
		Theory(Elective) – 06		
	II	Theory (Core) - 18	32	
		Practical – 06		
		Elective – 06		
		SEC-02		
S.Y.B.Sc. (Computer Science)	III	Theory (Core) -24	36	70
		Practical – 06		
		Theory(Elective) – 04		
		SEC-02		
	IV	Theory (Core) – 24	34	
		Practical-06		
		Theory(Elective) -04		
T.Y.B.Sc. (Computer Science)	V	Theory (Core) -20	34	66
		Practical-06		
		Theory(Elective) -04		
		AECC-02		
		Mini Project -02		
	VI	Theory (Core) -20	32	
		Practical-06		
		Theory(Elective) -04		
		Mini Project -02		
Grant Total of the Course (All Semesters)			**198 (192+6)**	**198**

6. Nature and Extent of B. Sc. (Computer Science):

Bachelor of Science (Computer Science) is a general multidiscipline bachelor programme. The programme has a balanced emphasis on three science subjects, one of which is computer science. A student studying B.Sc. (Computer Science) is required to choose two other subjects from a pool of subjects, which include Mathematics, Statistics, and Electronics. Different institutions offer different choice of combinations of subjects. Most popular combination is Mathematics and Electronics, but there are also combinations like Statistics and Economics or Commerce and Economics along with Computer Science.

6.1 Aims of Bachelor of Science Program in Computer Science B.Sc.(Computer Science):

The B.Sc. (Computer Science) program emphasizes problem solving in the context of algorithm development and software implementation and prepares students for effectively using modern computer systems in various applications. The curriculum provides required Computer Science courses such as Programming Languages, Data Structures, Computer Architecture and Organization, Algorithms, Database Systems, Operating Systems and Software Engineering; as well as elective courses in Data Mining, computer-based communication networks, distributed computing, Data

Analytics, web technology, and other current topics in computer science. The main aim of this Bachelor's degree is to deliver a modern curriculum that will equip graduates with strong theoretical and practical backgrounds to enable them to excel in the workplace and to be lifelong learners. The purpose of the B.Sc. (Computer Science) are twofold:

1. to prepare the student for a position involving the design, development and implementation of computer software/hardware, and

2. to prepare the student for entry into a program of postgraduate study in Computer Science/Engineering and related fields

The B.Sc. (Computer Science) program focuses on the concepts and techniques used in the design and development of software systems. Students in this program explore the conceptual underpinnings of Computer Science, its fundamental algorithms, programming languages, operating systems and software engineering techniques. In addition, students choose from a rich set of electives that includes Data Analytics, , Cloud Computing, Data Mining and Data Warehousing and computer networks, among other topics. A generous allotment of free electives allows students to combine study in computer science with study in auxiliary fields to formulate a program that combines experiences across disciplines.

6.2 <u>Graduate Attributes</u>:

Graduate Attributes (GA) are the qualities, skills and understandings that students should develop during their time with the HEI. These are qualities that also prepare graduates as agents of social good in future.

Graduate Attributes can be viewed as qualities in following subcategories:

1. Knowledge of the discipline
2. Creativity
3. Intellectual Rigour
4. Problem Solving and Design
5. Ethical Practices
6. Lifelong Learning
7. Communication and Social Skills

Among these attributes, categories attributes under Knowledge of the Discipline are specific to a programme of study.

- **Knowledge of Discipline of Computer Science:**

Knowledge of a discipline is defined as command of a discipline to enable a smooth transition and contribution to professional and community settings. This Graduate Attribute describes the capability of demonstrating comprehensive and considered knowledge of a discipline. It enables students to evaluate and utilize information and apply their disciplinary knowledge and their professional skills in the workplace.

- **Creativity:**

Creativity is a skill that underpins most activities, although this may be less obvious in some disciplines. Students are required to apply imaginative and reflective thinking to their studies. Students are encouraged to look at the design or issue through differing and novel perspectives. Creativity allows the possibility of a powerful shift in outlook and enables students to be open to thinking about different concepts and ideas.

- **Intellectual Rigour:**

Intellectual Rigour is the commitment to excellence in all scholarly and intellectual activities, including critical judgement. The students are expected in having clarity in thinking. This capability involves engaging constructively and methodically when exploring ideas, theories and philosophies. It

also relates to the ability to analyse and construct knowledge with depth, insight and intellectual maturity.

- **Problem Solving and Design:**

Problem solving skills empower students not only within the context of their programmes, but also in their personal and professional lives. Many employers cite good problem solving skills as a desired attribute that they would like graduates to bring to the workplace. With an ability to seek out and identify problems, effective problem solvers are able to actively engage with a situation, think creatively, to consider different perspectives to address identified challenge, to try out possible solutions and subsequently evaluate results as a way to make decisions. Through this process they can consolidate new and emergent knowledge and develop a deeper understanding of their subject discipline.

- **Ethical Practices:**

Ethical practice is a key component of professionalism and needs to be instilled in curricula across courses. When operating ethically, graduates are aware that we live in a diverse society with many competing points of view. Ethical behaviour involves tolerance and responsibility. It includes being open-minded about cultural diversity, linguistic difference, and the complex nature of our world. It also means behaving appropriately towards colleagues and the community and being sensitive to local and global social justice issues.

- **Life-Long Learning:**

The skill of being a lifelong learner means a graduate is open, curious, willing to investigate, and consider new knowledge and ways of thinking. This flexibility of mind means they are always amenable to new ideas and actively seek out new ways of learning or understanding the world.

- **Communication and Social Skills:**

The ability to communicate clearly and to work well in a team setting is critical to sustained and successful employment. Good communication and social skills involve the ability to listen to, as well as clearly express, information back to others in a variety of ways - oral, written, and visual - using a range of technologies.

- **Self-Management:**

Graduates must have capabilities for self-organisation, self-review, personal development and life-long learning.

6.3 List of Graduate Attributes for B.Sc. (Computer Science):

Afore-mentioned GAs can be summarized in the following manner.
- A commitment to excellence in all scholarly and intellectual activities, including critical judgement
- Ability to think carefully, deeply and with rigour when faced with new knowledge and arguments.
- Ability to engage constructively and methodically when exploring ideas, theories and philosophies
- Ability to consider other points of view and make a thoughtful argument
- Ability to develop creative and effective responses to intellectual, professional and social challenges
- Ability to apply imaginative and reflective thinking to their studies
- Commitment to sustainability and high ethical standards in social and professional practices.

- To be open-minded about cultural diversity, linguistic difference, and the complex nature of our world
- Ability to be responsive to change, to be inquiring and reflective in practice, through information literacy and autonomous, self-managed learning.
- Ability to communicate and collaborate with individuals, and within teams, in professional and community settings
- Ability to communicates effectively, comprehending and writing effective reports and design documentation, summarizing information, making effective oral presentations and giving and receiving clear oral instructions
- Ability to demonstrates competence in the practical art of computing in by showing in design an understanding of the practical methods, and using modern design tools competently for complex real-life IT problems
- Ability to use a range of programming languages and tools to develop computer programs and systems that are effective solutions to problems.
- Ability to understand, design, and analyse precise specifications of algorithms, procedures, and interaction behaviour.
- Ability to apply mathematics, logic, and statistics to the design, development, and analysis of software systems
- Ability to be equipped with a range of fundamental principles of Computer Science that will provide the basis for future learning and enable them to adapt to the constant rapid development of the field.
- Ability of working in teams to build software systems.
- Ability to identify and to apply relevant problem-solving methodologies
- Ability to design components, systems and/or processes to meet required specifications
- Ability to synthesise alternative/innovative solutions, concepts and procedures
- Ability to apply decision making methodologies to evaluate solutions for efficiency, effectiveness and sustainability
- A capacity for self-reflection and a willingness to engage in self-appraisal
- Open to objective and constructive feedback from supervisors and peers
- Able to negotiate difficult social situations, defuse conflict and engage positively in purposeful debate.

6.4 Qualification Descriptor for B.Sc. (Computer Science):

On completion of B.Sc. (Computer Science), the expected learning outcomes that a student should be able to demonstrate are the following:

- Fundamental understanding of the principles of Computer Science and its connections with other disciplines
- Procedural knowledge that creates different types of professionals related to Computer Science, including research and development, teaching and industry, government and public service;
- Skills and tools in areas related to computer science and current developments in the academic field of study.
- Use knowledge, understanding and skills required for identifying problems and issues, collection of relevant quantitative and/or qualitative data drawing on a wide range of sources, and their application, analysis and evaluation using methodologies as appropriate to Computer Science for formulating solutions
- Communicate the results of studies undertaken in Computer Science accurately in a range of different contexts using the main concepts, constructs and techniques

- Meet one's own learning needs, drawing on a range of current research and development work and professional materials
- Apply Computer Science knowledge and transferable skills to new/unfamiliar contexts,
- Demonstrate subject-related and transferable skills that are relevant to industry and employment opportunities.

6.5 Programme Learning Outcomes for B.Sc. (Computer Science):

The Bachelor of Science (Computer Science) program enables students to attain, by the time of graduation:

- demonstrate the aptitude of Computer Programming and Computer based problem-solving skills
- display the knowledge of appropriate theory, practices and tools for the specification, design, implementation
- ability to learn and acquire knowledge through online courses available at different MOOC Providers
- ability to link knowledge of Computer Science with other two chosen auxiliary disciplines of study
- display ethical code of conduct in usage of Internet and Cyber systems
- ability to pursue higher studies of specialization and to take up technical employment
- ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate
- ability to operate, manage, deploy, configure computer network, hardware, software operation of an organization
- ability to present result using different presentation tools.
- Ability to appreciate emerging technologies and tools

F.Y.B.Sc. (Computer Science): Semester I (From the Academic Year 2018-19)

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment	University Examination	Total
Core Courses	CS -11	Introduction to RDBMS	03	03	03	40	60	100
	CS -12	Programming in C - I	03	03	03	40	60	100
	CS -13	Mathematical Foundation of Computer Science	03	03	03	40	60	100
	CS -14	Algebra -I	03	03	03	40	60	100
	CS -15	Principles of Analog Electronics - I	03	03	03	40	60	100
	CS-16	Principles of Digital Electronics -I	03	03	03	40	60	100
	CS PI	Computer Science Practical - I	04	02	03	40	60	100
	CS PII	Computer Science Practical - II	04	02	03	40	60	100
	CS EI	Electronics Practical -I	04	02	03	40	60	100
Elective Courses	**Any Two from the following:**							
	CS -17	Computer Oriented Statistical Techniques - I	03	03	03	40	60	100
	CS-18	Compulsory English -I	03	03	03	40	60	100
	CS-19	Elementary Algorithmics	03	03	03	40	60	100

F.Y.B.Sc. (Computer Science): Semester II (From the Academic Year 2018-19)

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment	University Examination	Total
Core Courses	CS -21	RDBMS using oracle	03	03	03	40	60	100
	CS -22	Programming in C - II.	03	03	03	40	60	100
	CS -23	Graph Theory	03	03	03	40	60	100
	CS -24	Algebra-II	03	03	03	40	60	100
	CS -25	Principles of Analog Electronics - II	03	03	03	40	60	100
	CS -26	Principles of Digital Electronics -II	03	03	03	40	60	100
	CS PIII	Computer Science Practical - III	04	02	03	40	60	100
	CS PIV	Computer Science Practical - IV	04	02	03	40	60	100
	CS EII	Electronics Practical –II	04	02	03	40	60	100

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment	University Examination	Total
Elective Courses	**Any Two from the following:**							
	CS -27	Computer Oriented Statistical Techniques -II	03	03	03	40	60	100
	CS-28	Compulsory English -II	03	03	03	40	60	100
	CS-29	Operating Environment	03	03	03	40	60	100
	This paper is compulsory for all the students:							
Skill Enhancement course	UGSEC-21	HTML Programming	02	02	03	20	30	50

S.Y.B.Sc. (Computer Science): Semester III (From the Academic Year 2019-20)

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment	University Examination	Total
Core Courses	CS -31	Object Oriented Programming with C++	04	04	03	40	60	100
	CS -32	Introduction to .Net using C#	04	04	03	40	60	100
	CS -33	Linear Algebra	04	04	03	40	60	100
	CS -34	Computer Oriented Numerical Methods	04	04	03	40	60	100
	CS -35	Digital systems and Microprocessors	04	04	03	40	60	100
	CS -36	Principles of Communication	04	04	03	40	60	100
	CS PV	Computer Science Practical - V	04	02	03	40	60	100
	CS PVI	Computer Science Practical - VI	04	02	03	40	60	100
	CS EIII	Electronics Practical - III	04	02	03	40	60	100
Elective Courses	**Any One from the following:**							
	CS -37	Cloud Computing - I	04	04	03	40	60	100
	CS -38	Data warehousing and data mining-I	04	04	03	40	60	100
Skill Enhancement Course	**This paper is compulsory for all the students:**							
	UGSEC-31	Programming in Python	02	02	02	20	30	50

S.Y.B.Sc. (Computer Science): Semester IV (From the Academic Year 2019-20)

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Continuous Internal Assessment	University Examination	Total
Core Courses	CS -41	Data Structures using C++	04	04	03	40	60	100
	CS -42	ASP.Net	04	04	03	40	60	100
	CS -43	Computational Geometry	04	04	03	40	60	100
	CS -44	Optimization Techniques	04	04	03	40	60	100
	CS -45	8051 Microcontroller	04	04	03	40	60	100
	CS -46	Analog Systems	04	04	03	40	60	100
	CS PVII	Computer Science Practical - VII	04	02	03	40	60	100
	CS PVIII	Computer Science Practical - VIII	04	02	03	40	60	100
	CS EIV	Electronics Practical -IV	04	02	03	40	60	100
Elective Courses	**Any One from the following:**							
	CS -47	Cloud Computing -II	04	04	03	40	60	100
	CS -48	Data warehousing and data mining-II	04	04	03	40	60	100

Environment Studies

As per the order of Honourable Supreme Court of India, this course is compulsory for every undergraduate student. The college is implementing this module course in Environment Studies in the second year of all degree courses. There will be 50 lectures for this course. The examination will be conducted at the end of Semester IV and will carry 50 marks. These marks will be converted into the grades accordingly. These grades will be mentioned in the degree marksheet. If any student fails in this course, the result of his/her degree course will be withheld by the university.

T.Y.B.Sc(Computer Science): Semester V (From the Academic Year 2020-21)

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Continuous Internal Assessment	University Examination	Total
Core Courses	CS -51	System Programming	04	04	03	40	60	100
	CS -52	Internet Technologies-I	04	04	03	40	60	100
	CS -53	Theoretical Computer Science	04	04	03	40	60	100
	CS -54	Programming in JAVA-I	04	04	03	40	60	100
	CS -55	Software Engineering	04	04	03	40	60	100
	CS PIX	Computer Science Practical - IX	04	02	03	40	60	100

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Continuous Internal Assessment	University Examination	Total
						Maximum Marks		
	CS PX	Computer Science Practical -X	04	02	03	40	60	100
	CS PXI	Computer Science Practical -XI	04	02	03	40	60	100
	CS MI	Mini Project –I	04	02	03	40	60	100
Elective Courses	**Any One from the following:**							
	CS -56	Data Communication and Networking -I	04	04	03	40	60	100
	CS -57	Data Analytics -I	04	04	03	40	60	100
	CS -58	Research in Computer Science –I	04	04	03	40	60	100
Ability enhancement Compulsory Course	**This paper is compulsory for all the students:**							
	UGAE CC-51	Soft Skills	02	02	02	20	30	50

T.Y.B.Sc. (Computer Science): Semester VI (From the Academic Year 2020-21)

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Continuous Internal Assessment	University Examination	Total
						Maximum Marks		
Core Courses	CS -61	Linux Programming	04	04	03	40	60	100
	CS -62	Internet Technologies-II	04	04	03	40	60	100
	CS -63	Compiler Construction	04	04	03	40	60	100
	CS -64	Programming in JAVA-II	04	04	03	40	60	100
	CS -65	Unified Modeling Language	04	04	03	40	60	100
	CS PXII	Computer Science Practical - XII	04	02	03	40	60	100
	CS PXIII	Computer Science Practical -XIII	04	02	03	40	60	100
	CS PXIV	Computer Science Practical -XIV	04	02	03	40	60	100
	CS MII	Mini Project -II	04	02	03	40	60	100
Elective Courses	**Any One from the following:**							
	CS -66	Data Communication and Networking-II	04	04	03	40	60	100
	CS -67	Data Analytics -II	04	04	03	40	60	100
	CS -68	Research in Computer Science –II	04	04	03	40	60	100

7. SCHEME OF TEACHING:

Semester	Subject	Work Load / Week			
		Theory	Tutorial	Total	Practical
F.Y.B.Sc(Computer Science) Semester – I & II	Each subject	2	1	03	04
S.Y.B.Sc(Computer Science) Semester – III & IV	Each subject	3	1	04	04
T.Y.B.Sc(Computer Science) Semester – V & VI	Each subject	3	1	04	04

8. MEDIUM OF INSTRUCTION:
The medium of instruction and examination shall be English.

9. CHANGE OF COURSE
As all the heads of the course are compulsory change of course is not allowed.

10. SCHEME OF EXAMINATION:
The Assessment of Regular students of Bachelor of Science (B.Sc.) course in the academic session 2018-19 and thereafter shall be based on

    a. University Examinations (UE),
    b. Internal Assessment (IA),
    c. Choice Based Credit System (CBCS), and
    d. Semester Grade Point Average (SGPA) and Cumulative Grade Point Average system (CGPA)

For each core and elective paper of 100 marks, there will be Internal Assessment of 40 marks and the University Examination of 60 marks/3 hours duration at the end of each semester. The 04 credit will be given to a student who secures at least 40% of marks allotted to each paper. A candidate who does not pass the examination in any subject or subjects in one semester will be permitted to reappear in such failed subject or subjects along with the papers of following semesters.

The Internal Assessment (IA) for each paper will be of 40 marks. The Internal Assessment may be in the forms as follows:

    a) Attendance   10 Marks
    b) Home Assignment/Tutorial/Test/Presentation   15 Marks
    c) Mid Semester Examination   15 Marks

Each practical examination for laboratory course is of 100 marks and three-hour duration. The mini project included in the in Semesters V and VI will be evaluated for 100 marks for the allotted credits by a panel consisting of one internal and one external examiner .For both laboratory course and mini project , there will be internal assessment of 40 marks and the university examination of 60 marks.

A candidate shall be permitted to proceed further from the first semester upto Fourth Semester Irrespective of his/her failure in any of the semester Examinations subject to the condition that the candidates should register for all the arrear subjects of earlier semesters along with current (Subsequent) semester subject. However he/she should have cleared all the papers at F.Y.B.Sc. (Comp. Sc.) I and II when He/She gets admission to T.Y.B.Sc. (Comp. Sc.) Sem V.

11. GRACING:
The gracing shall be done as per existing rules of the University.

12. VERIFICATION AND REVALUATION:
There is provision for verification and revaluation of the result. A student can apply for the verification and revaluation of the result within the two weeks from the declaration of the results with the prescribed fee. The verification and revaluation shall be done as per the existing rules of the University.

13. STANDARD OF PASSING:

For all courses, both UE and IA constitute separate heads of passing. In order to pass in such courses and to earn the assigned credits, the learner must obtain a minimum grade point of 5.0 (40% marks) at UE and also a minimum grade point of 5.0 (40% marks) at IA.

If a student fails in IA, the learner passes in the course provided he/she obtains a minimum of 25% in IA and GPA for the course is at least 6.0 (50% in aggregate). The GPA for a course will be calculated only if the learner passes at the UE.

A student who fails at UE in a course has to reappear only at UE as a backlog candidate and clear the head of passing. Similarly, a student who fails in a course at IA has to reappear only at IA as a backlog candidate and clear the head of passing.

The 10-point scale Grades and Grade Points according to the following table.

Range of Marks (Out of 100)	Grade	Grade Point
80 ≤ Marks ≤ 100	O	10
70 ≤ Marks < 80	A+	9
60 ≤ Marks < 70	A	8
55 ≤ Marks < 60	B+	7
50 ≤ Marks < 55	B	6
40 ≤ Marks < 50	C	5
Marks < 40	D	0

The performances at UE and IA will be combined to obtain the Grade Point Average (GPA) for the course. The weights for performance at UE and IA shall respectively be 60% and 40%.

GPA is calculated by adding the UE marks out of 60 and IA marks out of 40. The total marks out of 100 are converted to grade point, which will be the GPA

Formula to calculate Grade Points (GP)
Suppose that '*Max*' is the maximum marks assigned for an examination or evaluation based on which GP will be computed. In order to determine the GP, Set $x = Max / 10$ (since we have adapted 10-point system). Then GP is calculated by the formulas shown as below.

Range of Marks at the evaluation	Formula for the Grade Point
$8x \leq$ Marks $\leq 10x$	10
$5.5x \leq$ Marks $<8x$	Truncate (Marks/x) +2
$4x \leq$ Marks $<5.5x$	Truncate (Marks/x) +1

Two kinds of performance indicators, namely, the Semester Grade Point Average (SGPA) and the Cumulative Grade Point Average (CGPA) shall be computed at the end of each term. The SGPA measures the cumulative performance of a learner in all the courses in a particular semester, while the CGPA measures the cumulative performance in all courses since his/her enrolment. The CGPA of learner when he/she completes the programme is the final result of the learner.

The SGPA is calculated by the formula SGPA=$\frac{\sum Ck \times GPk}{\sum Ck}$, where C_k is the credit-value assigned to a course and GP_k is the GPA obtained by the learner in the course. In the above, the sum is taken over all the courses that the learner has undertaken for the study during the semester, including those in which he/she might have failed or those for which he/ she remained absent. **The SGPA shall be calculated up to two decimal place accuracy.**

The CGPA is calculated by the formula CGPA=$\frac{\sum Ck \times GPk}{\sum Ck}$, where C_k is the credit-value assigned to a course and GP_k is the GPA obtained by the learner in the course. In the above, the sum is taken over all the courses that the learner has undertaken for the study from the time of his/her enrolment and also the during the semester for which CGPA is calculated, including those in which he/she might have failed or those for which he/she remained absent. **The CGPA shall be calculated up to two decimal place accuracy.**

The Formula to compute equivalent percentage marks for specified CGPA:

% Marks (CGPA) =	$10 \times CGPA - 10$	if $5.00 \leq CGPA \leq 6.00$
	$5 \times CGPA + 20$	if $6.00 \leq CGPA \leq 8.00$
	$10 \times CGPA - 20$	if $8.00 \leq CGPA \leq 9.00$
	$20 \times CGPA - 110$	if $9.00 \leq CGPA \leq 9.50$
	$40 \times CGPA - 300$	if $9.50 \leq CGPA \leq 10.00$

Award of Honours:

A student who has completed the minimum credits specified for the programme shall be declared to have passed in the programme. The final result will be in terms of letter grade only and is based on the CGPA of all courses studied and passed. The criteria for the award of honours are given below.

Range of CGPA	Final Grade	Performance Descriptor	Equivalent Range of Marks (%)
$9.50 \leq CGPA \leq 10.00$	O	Outstanding	$80 \leq Marks \leq 100$
$9.00 \leq CGPA \leq 9.49$	A+	Excellent	$70 \leq Marks < 80$
$8.00 \leq CGPA \leq 8.99$	A	Very Good	$60 \leq Marks < 70$
$7.00 \leq CGPA \leq 7.99$	B+	Good	$55 \leq Marks < 60$
$6.00 \leq CGPA \leq 6.99$	B	Average	$50 \leq Marks < 55$
$5.00 \leq CGPA \leq 5.99$	C	Satisfactory	$40 \leq Marks < 50$
CGPA Below 5.00	F	Fail	Marks Below 40

14. Format of the transcript:

The student will be given a transcript indicating his/her performance at the end of every semester examination. The transcript shall be given as per the following table along with other necessary details:

Course No.	Course Name	No. of Credits	University Examination		Internal Assessment		Grade Point Average	Result
			Grade	Grade Point	Grade	Grade Point		
1								
2								
3								
4								
5								
Total Cumulative Credits Completed		SGPA		CGPA		Equivalent Marks (%)		

Note: GPA is calculated by adding the UE marks out of 60 and IA marks out of 40. The total marks out of 100 are converted to Grade Point, which will be the GPA.

*   *   *   *   *