



UNIVERSITY OF CALICUT

Abstract

General and Academic - Faculty of Science - Syllabus of MSc Computer Science Programme under CBCSS PG Regulations 2019 for affiliated colleges with effect from 2020 Admission onwards- Incorporating Outcome Based Education - Implemented - Subject to ratification by the Academic Council - Orders Issued.

G & A - IV - J

U.O.No. 5810/2021/Admn

Dated, Calicut University.P.O, 31.05.2021

*Read:-*1. U.O No.8961/2019/Admn, Dated 07.07.2019.

2. Item No.2 in the minutes of the meeting of the Board of Studies in Computer Science & Application PG held on 28.04.2021.
3. Remarks of the Dean, Faculty of Science, Dated 28.05.2021.
4. Orders of the Vice Chancellor in the file of even no, Dated 29.05.2021.

ORDER

1. Orders were issued vide paper read (1) above, implementing the scheme and syllabus of M.Sc Computer Science Programme for affiliated colleges, under CBCSS PG Regulations 2019, w.e.f 2019 admission onwards, vide paper read (1) above.
2. The meeting of Board of Studies in Computer Science & Application PG held on 28.04.2021 approved the existing syllabus of M.Sc Computer Science Programme incorporating Outcome Based Education (OBE) in the existing syllabus, in tune with the new CBCSS PG Regulations with effect from 2020 Admission onwards, vide paper read (2) above.
3. The Scheme and Syllabus of M.Sc Computer Science Programme under CBCSS PG Regulations 2019, incorporating Outcome Based Education(OBE) in the existing syllabus, has been approved by the Dean, Faculty of Science, vide paper read (3) above and by the Vice Chancellor, subject to ratification by the Academic Council, vide paper read (4) above.
4. Scheme and Syllabus of M.Sc Computer Science Programme for for affiliated colleges, incorporating Outcome Based Education(OBE) in the existing syllabus, in tune with the new CBCSS PG Regulations, is therefore implemented with effect from 2020 Admission onwards,subject to ratification by the Academic Council.
5. Orders are issued accordingly.
6. U.O No.8961/2019/Admn dated 07.07.2019 stands modified to this extent. (modified syllabus appended)

Ajitha P.P

Joint Registrar

To

Principals of all Affiliated Colleges

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Section Officer



UNIVERSITY OF CALICUT

**DEGREE OF
MASTER OF SCIENCE (M.Sc.)
IN
COMPUTER SCIENCE**

AS PER

**CHOICE BASED CREDIT AND SEMESTER
SYSTEM - CBCSS (PG)**

**OBE BASED PROGRAMME CURRICULUM
(EFFECTIVE FROM 2020 ADMISSION ONWARDS)**

**BOARD OF STUDIES IN COMPUTER SCIENCE AND
APPLICATIONS (PG)**

University of Calicut, Kerala 673 635

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I

**REGULATIONS FOR THE DEGREE OF MASTER OF
SCIENCE (COMPUTER SCIENCE)****CBCSS – PG****EFFECTIVE FROM 2020 ADMISSION ONWARDS****1. PROGRAMME OBJECTIVES**

The course of the MSc (Computer Science) Programme is designed with the following objectives:

1. To equip students to take up challenging research-oriented responsibilities and courses for their higher studies/profession.
2. To train and equip the students to meet the requirements of the Software industry in the country and outside.
3. To motivate and support the students to prepare and qualify challenging competitive examinations such as JRF/NET/JAM/GATE etc.

2. PROGRAMME OUTCOME (PO)

After the successful completion of the Post Graduate Programme, M.Sc Computer Science at University of Calicut, a student would have :

PO1:	Attained in depth knowledge of foundations of computing.
PO2:	Development of soft skills and practicing professional ethics.
PO3:	An ability to understand, analyze and design efficient algorithms.
PO4:	Apply computer science theory and software development concepts to construct computing-based solutions.
PO5:	To make them employable according to the current demand of the IT Industry and responsible citizens.
PO6:	An ability to understand and solve emerging research problems.
PO7:	Develop programming skills to implement research projects.

3. PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1:	Evaluate complex real-world problems by applying principles of theoretical computing, engineering and Mathematical models.
PSO2:	Modern Tool usage: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
PSO3:	Understand all dimensions of the concepts of software application development and projects.
PSO4:	Aware the students to publish their work in reputed journals.
PSO5:	Conceive Project Management capabilities to solve real world problems in accordance to the needs of the industry, in a specific time frame.
PSO6:	Design and develop computer programs/computer-based systems in the field of Computer Sciences viz. Computational Intelligence, Machine learning, Web technology, Information Retrieval Systems, Data Analytics, Communication and networking.
PSO7:	To prepare the students to address the challenging requirements coming from the enterprise applications.

4. ADMISSION

1. The admission to all M.Sc Computer Science programmes shall be as per the rules and regulations of the University.
2. The eligibility criteria for admission shall be as announced by the University from time to time.
3. Separate rank lists shall be drawn up for reserved seats as per the existing rules.
4. The college shall make available to all the admitted students the information regarding all the courses including electives offered with syllabus and credit for the entire course.
5. There shall be a uniform calendar prepared by the University for the Conduct of the programmes.
6. There shall be provision for inter collegiate and inter University transfer in the 2nd and 3rd semester within a period of two weeks from the date of commencement of the semesters.
7. There shall be provision for credit transfer subject to the conditions specified by the Board of Studies concerned.
8. There shall be a uniform calendar prepared by the University for the registration, conduct/schedule of the courses, examinations and publication of results.

5. READMISSION

1. There shall be provision for readmission of students.
2. For readmission, the vacancy should be within the sanctioned strength in the parent college. If there is no vacancy in the junior batch of the parent college, readmission can be taken in another college with the junior batch, if there is vacancy within the sanctioned strength in the concerned college.
3. This readmission is not to be treated as college transfer.
4. There should be a gap of at least one semester for readmission.
5. The candidate seeking readmission to a particular semester should have registered for the previous semester examination.
6. Readmission shall be taken within two weeks from the date of commencement of the semester concerned.
7. The Principal can grant readmission to the student, subject to the above conditions, and inform the matter of readmission to the Controller of Examinations within one month of such readmission.
8. If change in scheme occurs while readmission, provision for credit transfer will be subject to the common guidelines prepared by the Board of Studies/ Faculty concerned.

6. DURATION OF THE PROGRAMME

1. The minimum duration for completion of a four semester PG Programme is two years. The maximum period for completion is 4 years.
2. The duration of each semester shall be 90 working days, inclusive of examinations, spread over five months.
3. Odd semesters shall be held from June to October and even semesters from November to March subject the academic calendar of the University.

7. PROGRAMME STRUCTURE

1. The Programme includes three types of courses, viz., Core courses (Code C), Elective Courses (Code E) and Audit Courses (Code A).
2. Every student of the MSc Computer Science Programme shall have to work on a project/dissertation of not less than 8 credits under the supervision of a faculty member as per the curriculum. Project/dissertation shall be treated as Core Courses. Project Work is mandatory for all regular Programmes and Comprehensive Viva-voce is optional and these shall be done in the end semester. The combined Credit for the Project Work and Comprehensive Viva-voce shall not be more than 8 (eight) credits subject to a minimum of 4 (four) credit for Project Work. All students have to submit a Project Report/Dissertation in the prescribed structure and format as a part of the Project Work undertaken.

3. Total credit for the Programme shall be 80 (eighty), this describes the weightage of the course concerned and the pattern of distribution is as detailed below
 - i) Total Credit for Core Courses shall not be less than 60 (sixty) and not more than 68 (sixty-eight).
 - ii) Total Credit for Elective Course shall not be less than 12 (twelve) and not more than 20 (Twenty).
 - iii) Total Credits for Comprehensive Viva-voce and Project Work combined together shall be 8 (eight) subject to a minimum of 4 (four) credit for Project Work.
 - iv) Total credit in each semester shall vary between 18 to 22.
 - v) No course shall have less than 2 credits and more than 5 credits.
1. Elective courses shall be spread over either in the Third & Fourth Semesters combined.
2. Audit Courses: There will be two Audit Courses (Ability Enhancement Course & Professional Competency Course) with 4 credits each. These have to be done one each in the first two semesters. The credits will not be counted for evaluating the overall SGPA & CGPA. The colleges shall conduct examinations for these courses and have to intimate /upload the results of the same to the University on the stipulated date during the III Semester. Students have to obtain only minimum pass requirements in the Audit Courses.
3. A student shall accumulate a minimum of 80 credits for the successful completion of the Programmes.

8. REGISTRATION

1. A student shall be permitted to register for a Programme at the time of admission.
2. A student who registers for a Programme shall complete it within 4 years.
3. The college shall send a list of students registered for each Programme in each semester giving the details of courses registered to the university in the prescribed form within 45 days of the commencement of the semester.
4. Students shall be normally permitted to register for the examination if they have required minimum attendance. If the student has a shortage of attendance in a semester, the student shall be permitted to move to the next semester and can write the examination for the entire courses of the semester in which shortage of attendance occurs as supplementary examination only after the completion of the entire Programme. In such cases, a request from the student may be forwarded through the Principal of the college to the Controller of Examinations within two weeks of the commencement of the semester. There will not be any Repeat semester in CBCSS PG 2021.
5. The students who have attendance within the limit, but could not register for the semester examinations, have to apply for token registration, within two weeks of the commencement of the next semester.

9. ATTENDANCE

1. The students admitted in the PG Programmes in affiliated colleges shall be required to attend at least 75 percent of the total number of classes (theory/practical) held during each semester. The students having less than prescribed percentage of attendance shall not be allowed to appear for the University examination.
2. Condonation of shortage of attendance for a maximum of 9 days (10% of the working days in a semester) in the case of single condonation and 18 days (20% of the working days in a semester) in the case of double condonation in a semester subject to a maximum of two times (for single condonation only) during the whole period of Post Graduate Programme may be granted by the University as per the existing procedures. In the case of double condonation, only one condonation shall be allowed during the entire Programme.
3. Benefit of condonation of attendance will be granted to the students on health grounds, for participating in University Union activities, meeting of the University bodies /Govt. bodies and participation in other extracurricular activities on production of genuine supporting documents, with the recommendation of the Head of the Department concerned.
4. A student who is not eligible for such condonation shall be observed the provisions as per clause 6.4 of this regulation. The principal should intimate the details of these candidates at the commencement of the next semester.
5. Women students can avail maternity leave as per the existing university rules.

10. EXAMINATION

1. There shall be a University examination at the end of each semester.
2. Practical examinations shall be conducted by the University at the end of each semester. There will be one internal and one external examiner for the conduct of End Semester Practical examination.
3. Project Work / Dissertation shall be evaluated at the end of the Programme only. There shall be both Internal and External evaluation for the Project Work.
4. There shall be one end-semester examination of 3 hours duration for each theory course and practical course.

11. EVALUATION AND GRADING

1. Evaluation: The evaluation scheme for each course shall contain two parts; (a) Internal / Continuous Assessment (CA) and (b) External / End Semester Evaluation (ESE).
2. Of the total, 20% weightage shall be given to Internal evaluation / Continuous assessment and the remaining 80% to External/ESE and the ratio and weightage between Internal and External is 1:4.
3. Primary evaluation for Internal and External shall be based on 6 letter grades (A+, A, B, C, D and E) with numerical values (Grade Points) of 5, 4, 3, 2, 1 & 0 respectively.
4. Grade Point Average: Internal and External components are separately graded and the combined grade point with weightage 1 for Internal and 4 for external shall be applied to calculate the Grade Point Average (GPA) of each course. Letter grade shall be assigned to each course based on the categorization based on Ten-point Scale.
5. Evaluation of Audit Courses: The examination and evaluation shall be conducted by the college itself either in the normal structure or MCQ model from the Question Bank and other guidelines provided by the University/BoS. The Question paper shall be for minimum 20 weightage and a minimum of 2 hour duration for the examination. The result has to be intimated / uploaded to the University during the Third Semester as per the notification of the University.

12. INTERNAL EVALUATION – CONTINUOUS ASSESSMENT

1. This assessment shall be based on a predetermined transparent system involving periodic written tests, assignments, seminars and viva-voce in respect of theory courses and based on tests, lab skill and records/viva in respect of practical courses.
2. The criteria and percentage of weightage assigned to various components for internal evaluation are as follows:
 - (a) Theory: The weightage assigned to various components for internal evaluation for theory papers is as shown below.

Sl.No	Component	Percentage	Weightage
1	Examination /Test	40%	2
2	Seminars / Presentation	20%	1
3	Assignment	20%	1
4	Attendance	20%	1

To ensure transparency of the evaluation process, the internal assessment grade awarded to the students in each course in a semester shall be published on the notice board at least one week before the commencement of external examination. There shall not be any chance for improvement for internal grade.

The course teacher shall maintain the academic record of each student registered for the course, which shall be forwarded to the University, through the college Principal.

(b) Practical: The mark distribution to award internal continuous assessment marks for practical course should be as follows:

Sl.No	Component	Percentage	Weightage
1	Lab Skill	40%	4
2	Records/viva	30%	3
3	Practical Test	30%	3

Note:

- All students should have a rough record (observation note book) in which they write all the works to be carried out in the lab prior to his/her entering the lab. (S)he may also note down the i/p and o/p that (s)he gives for program verification in the observation note book (rough record).
 - All lab works should be neatly recorded in a Laboratory Record Book (Fair Record) in written form. However, program results can be pasted in the left-hand side of the fare record.
 - Chairperson, Board of Examination (PG) has to prepare the modalities of the practical papers (list of experiments to be done, number of minimum experiments required in the practical record etc.) and distributed to all departments concerned, at the beginning of each semester itself. Model lists of experiments are provided with the syllabus for each practical session.
 - No candidate will be permitted to attend the end-semester test unless he/she produces a certified record of the laboratory.
3. Grades shall be given for the internal evaluation based on the grades A+, A, B, C, D & E with grade points 5,4,3,2, 1 & 0 respectively. The overall grades shall be as per the Ten Point scale.
 4. There shall be no separate minimum Grade Point for internal evaluation.
 5. To ensure transparency of the evaluation process, the internal assessment marks awarded to the students in each course in a semester shall be published on the notice board before 5 days of commencement of external examination.
 6. There shall not be any chance for improvement of internal marks.
 7. The course teacher shall maintain the academic record of each student registered for the course, which shall be forwarded to the University, through the college Principal, after being endorsed by the Head of the Department.
 8. For each course there shall be class test/s during a semester. Grades should be displayed on the notice board. Valued answer scripts shall be made available to the students for perusal.
 9. Each student shall be required to do assignment/s for each course. Assignments after valuation must be returned to the students. The teacher shall define the expected quality of the above in terms of structure, content, presentation etc. and inform the same to the students. Punctuality in submission is to be considered.

10. Every student shall deliver Seminar / Presentation as an internal component for every course and must be evaluated by the respective course teacher in terms of structure, content, presentation and interaction. The soft and hard copies of the seminar report are to be submitted to the course teacher.
11. All the records of Continuous Assessment (CA) must be kept in the college and must be made available for verification by university, if asked for. Calculation of overall internal grade for one theory course will be done as shown below:

Components	Weightage (W)	Grade Awarded	Grade Point(GP)	Weighted GP	Overall Grade of the course
Examination /Test	4	A	4	16	Weighted GP/Total Weight $43/10 = 4.30$
Seminars / Presentation	3	A+	5	15	
Assignments	3	A	4	12	
Total	10			43	O

Calculation of overall internal grade for one Lab Course will be done as shown below:

Components	Weightage (W)	Grade Awarded	Grade Point(GP)	Weighted GP	Overall Grade of the course
Lab Skill	2	A	4	8	Weighted GP/Total Weight $22/5 = 4.40$
Records/viva	1	A+	5	5	
Practical Test	1	A	4	4	
Viva-voce	1	A+	5	5	
Total	5			22	

13. EXTERNAL / END SEMESTER EVALUATION (ESE)

1. The semester-end examinations in theory courses shall be conducted by the University with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation.
2. After the external evaluation, only Grades are to be entered in the space provided in the answer script for individual questions and calculations need to be done only up to the Cumulative Grade Point (CGP) and all other calculations including grades are to be done by the University.
3. Students shall have the right to apply for revaluation or scrutiny as per rules within the time permitted for it.
4. Photocopies of the answer scripts of the external examination shall be made available to the students for scrutiny on request by them as per rules.

4. The external evaluation shall be done immediately after the examination preferably in a Centralized Valuation Camp.
5. The language of writing the examination shall be English.
6. Pattern of questions for external/ESE (theory courses):
 - a. Questions shall be set to assess the knowledge acquired, standard, and application of knowledge, application of knowledge in new situations, critical evaluation of knowledge and the ability to synthesize knowledge. Due weightage shall be given to each module based on content/teaching hours allotted to each module.
 - b. It has to be ensured that questions covering all skills are set. The setter shall also submit a detailed scheme of evaluation along with the question paper.
 - c. A question paper shall be a judicious mix of short answer type, short essay type /problem solving type and long essay type questions.
 - d. The question shall be prepared in such a way that the answers can be awarded A+, A, B, C, D, E Grades.
 - e. Weightage: Different types of questions shall be given different weightages to quantify their range given in the following model:

Sl. No.	Type of Questions	Individual weightage	Total Weightage	Number of questions to be answered
1	Short Answer type questions	2	$2 \times 4 = 8$	4 out of 7
2	Short essay/ problem solving type	3	$3 \times 4 = 12$	4 out of 7
3	Long Essay type questions	5	$5 \times 2 = 10$	2 out of 4
Total			30	18

- f. Questions should be asked as far as possible from all modules following a uniform distribution.

A sample ESE evaluation sheet of a theory course is illustrated below:

Type of Question	Qn. No	Grade Awarded	Grade Point	Weightage	Weighted Grade Point	Calculation
Short Answer type	1	A+	5	2	10	Overall Grade of the theory paper = Sum of Weighted Grade Points / Sum of the weightage $115/30 = 3.83$ = Grade A+
	2	-	-	-	-	
	3	A	4	2	8	
	4	C	2	2	4	
	5	-	-	-	-	
	6	A	4	2	8	
	7	-	-	-	-	
Medium Essay type	8	B	3	3	9	
	9	A+	5	3	15	
	10	-	-	-	-	
	11	-	-	-	-	
	12	-	-	-	-	
	13	A	4	3	12	
	14	B	3	3	9	
Long Essay type	15	A+	5	5	25	
	16	-	-	-	-	
	17	-	-	-	-	
	18	B	3	5	15	
TOTAL				30	115	

7. End Semester Evaluation in Practical Courses shall be conducted and evaluated by both Internal and External Examiners.

Mark distribution for practical courses shall be as follows:

Component	Weightage
Algorithm/Flow diagram/UI diagram/Class	6
Implementation	6
Result/ Output	6
Record	6
Viva	6
Total	30

A sample ESE evaluation sheet of a theory course is illustrated below:

Type of Question	Grade Awarded	Grade Point	Weightage	Weighted Grade Point	Calculation
Algorithm/Flow diagram/UI diagram/Class Diagram	A	4	6	24	114/30 = 3.80
Implementation	A	4	6	24	
Result/ Output	B	3	6	18	
Record	A	4	6	24	
Viva	A	4	6	24	
Total			30	114	

14. EVALUATION OF PROJECT WORK / DISSERTATION

1. There shall be External and Internal evaluation for Project Work done and the grading system shall be followed.
2. One component among the Project Work evaluation criteria shall be Viva-voce (Project Work related) and the respective weightage shall be 40%.
3. Consolidated Grade for Project Work is calculated by combining both the External and Internal in the Ratio of 4:1 (80% & 20%).
4. For a pass in Project Work, a student has to secure a minimum of P Grade in External and Internal examination combined. If the students could not secure minimum P Grade in the Project work, they will be treated as failed in that attempt and the students may be allowed to rework and resubmit the same in accordance with the University exam stipulations. There shall be no improvement chance for Project Work.
5. The External and Internal evaluation of the Project Work shall be done based on the following criteria and weightages as detailed below:

Sl. No	Criteria	% of Weightage	Weightage	
			External	Internal
1	Relevance of the topic and Statement of problem, Methodology & Analysis Quality of Report & Presentation	60%	24	6
2	Viva-voce	40%	16	4
Total Weightage		100%	40	10

The first component for 60% weightage can be sub-divided into following project implementation components:

SINo	Components	Weightage	
		External	Internal
1	Relevance of the Topic, Statement of Objectives, Methodology	2	2
2	Quality of Literature Survey/Product Review	2	
3	Quality of Analysis Phase	2	
4	Quality of Design Phase	2	
5	Quality of Implementation/Simulation	4	2
6	Quality of Testing/Result Analysis	2	
7	Quality of Contributions	2	
8	Identification of Future Work	1	2
9	Quality of Project Report	4	
10	Publications/Presentations out of the Project Work*	1	
11	Quality of Presentation	1	
12	Demonstration of the Project Work	1	
13	General Viva Voce	16	4
	Total	40	10

15. DIRECT GRADING SYSTEM

1. Direct Grading System based on a 10 – Point scale is used to evaluate the performance (External and Internal Examination of students)
2. For all courses (Theory & Practical)/Semester/Overall Programme, Letter grades and GPA/SGPA/CGPA are given on the following way:
 - a. First Stage Evaluation for both Internal and External done by the Teachers concerned in the following Scale:

Grade	Grade Points
A+	5
A	4
B	3
C	2
D	1
E	0

b. The Grade Range for both Internal & External shall be :

Letter Grade	Grade Range	Range of Percentage (%)	Merit Indicator
O	4.25 - 5.00	85.00 - 100.00	Outstanding
A+	3.75 - 4.24	75.00 - 84.99	Excellent
A	3.25 - 3.74	65.00 - 74.99	Very Good
B+	2.75 - 3.24	55.00 - 64.99	Good
B	2.50 - 2.74	50.00 - 54.99	Above Average
C	2.25 - 2.49	45.00 - 49.99	Average
P	2.00 - 2.24	40.00 - 44.99	Pass
F	< 2.00	Below 40	Fail
I	0	-	Incomplete
Ab	0	-	Absent

- No separate minimum is required for Internal evaluation for a pass, but a minimum P Grade is required for a pass in the external evaluation. However, a minimum P grade is required for pass in a course.
- A student who fails to secure a minimum grade for a pass in a course will be permitted to write the examination along with the next batch.
- Improvement of Course- The candidates who wish to improve the grade / grade point of the external examination of a course/s they have passed already can do the same by appearing in the external examination of the concerned semester along with the immediate junior batch
- Betterment Programme One time- A candidate will be permitted to improve the CGPA of the Programme within a continuous period of four semesters immediately following the completion of the Programme allowing only once for a particular semester. The CGPA for the betterment appearance will be computed based on the SGPA secured in the original or betterment appearance of each semester whichever is higher.

16. SEMESTER GRADE POINT AVERAGE (SGPA)

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses taken by a student.

After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below.

$$\text{Semester Grade Point Average - SGPA (S}_j\text{)} = \sum(\text{C}_i \times \text{G}_i) / \text{C}_r$$

(SGPA= Total Credit Points awarded in a semester / Total credits of the semester)

Where 'S_j' is the jth semester, 'G_i' is the grade point scored by the student in the ith course 'C_i' is the credit of the ith course, 'C_r' is the total credits of the semester.

17. CUMULATIVE GRADE POINT AVERAGE (CGPA) - CALCULATION

Cumulative Grade Point Average (CGPA) = $\sum (C_i \times S_i) / C_r$

(CGPA= Total Credit points awarded in all semesters/Total credits of the programme)

Where C_1 is the credit of the 1st semester S_1 is the SGPA of the 1st semester and C_r is the total number of credits in the programme. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme. The SGPA and CGPA shall be rounded off to 2 decimal points.

For the successful completion of a semester, a student should pass all courses and score a minimum SGPA of 2.0. However, the students are permitted to move to the next semester irrespective of their SGPA.

18. GRADE CARD

1. The University shall issue to the students grade card on completion of each semester, which shall contain the following information:
 - Name of University
 - Name of College
 - Title of PG Programme
 - Semester concerned
 - Name and Register Number of the student.
 - Code number, Title and Credits of each Course opted in the semester including Audit Courses
 - Letter grade in each course in the semester
 - The total credits, total credit points and SGPA in the Semester (corrected to three decimal places)
2. The final Grade card issued at the end of the final semester shall contain the details of all courses taken during the entire Programme, including those taken over and above the prescribed minimum credits for obtaining the degree. The final grade card shall show CGPA (corrected to three decimal places), percentage of marks (corrected to two decimal places) and the overall letter grade of a student for the entire Programme. The final Grade card will also contain the list of Audit courses.

19. AWARD OF DEGREE

The successful completion of all the courses with P Grade shall be the minimum requirement for the award of the degree.

20. POSITION CERTIFICATE

The University publishes list of top 10 positions for each Programme after the publication of the Programme results. Position certificates shall be issued to candidates who secure positions from 1st to 10th in the list. The position list shall be finalized after the result of revaluation.

The position list shall be prepared in the order of merit based on the CGPA scored by the students. Grace Grade points awarded to the students shall not be counted for fixing the position.

21. GRIEVANCE REDRESSAL COMMITTEE

Department Level Committee:

The college shall form a Grievance Redressal Committee in each department comprising of course teacher, one senior teacher and elected representative of Students (Association Secretary) as members and the Head of the Department as Chairman. The committee shall have initial jurisdiction over complaints against Continuous Assessment.

College Level Committee:

There shall be a college level grievance redressal committee comprising of student adviser, two senior teachers, two staff council members (one shall be elected member) and elected representative of students (College Union Chairperson) as members and the Principal as Chairman. This committee shall address all grievances relating to the internal assessment grades of the students.

University level:

The University shall form a Grievance Redressal Committee as per the existing norms.

II M.Sc COMPUTER SCIENCE(CBCSS)-PROGRAMME STRUCTURE

LEGEND	
Item	Description
C	Credits
E	External Component (%)
I	Internal Component (%)
L	Lecture Hours
P	Practical Hours
T	Total

SEMESTER I

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
1.1	CSS1C01	Discrete Mathematical Structures	4	1	4	5	4	0	4
1.2	CSS1C02	Advanced Data Structures	4	1	4	5	3	2	5
1.3	CSS1C03	Theory of Computation	4	1	4	5	4	0	4
1.4	CSS1C04	The Art of Programming Methodology	4	1	4	5	2	2	4
1.5	CSS1C05	Computer Organization Architecture	4	1	4	5	4	0	4
1.6	CSS1L01	Practical I	2	1	4	5	0	4	4
1.7	CSS1A01	Introduction to Research (Ability Enhancement Audit Course)	4	5	0	5	0	0	0
Total Credits (Excluding Audit Course): 22							17	8	25

SEMESTER II

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
2.1	CSS2C06	Design and Analysis of Algorithms	4	1	4	5	4	0	4
2.2	CSS2C07	Operating System Concepts	4	1	4	5	3	2	5
2.3	CSS2C08	Computer Networks	4	1	4	5	4	0	4
2.4	CSS2C09	Computational Intelligence	4	1	4	5	2	2	4
2.5	CSS2C10	Principles of Software Engineering	4	1	4	5	4	0	4

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
2.6	CSS2L02	Practical II	2	1	4	5	0	4	4
2.7	CSS2A02	Term Paper (Professional Competency Audit Course)	4	5	0	5	0	0	0
Total Credits (Excluding Audit Course): 22							17	8	25

SEMESTER III

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
3.1	CSS3C11	Advanced Database Management System	4	1	4	5	3	1	4
3.2	CSS3C12	Object Oriented Programming Concepts	4	1	4	5	2	3	5
3.3	CSS3C13	Principles of Compilers	4	1	4	5	4	0	4
3.4	CSS3E01	Elective I	4	1	4	5	4	0	4
3.5	CSS3E02	Elective 2	4	1	4	5	4	0	4
3.6	CSS3L03	Practical III	2	1	4	5	0	4	4
Total Credits (Excluding Audit Course): 22							17	8	25

List of Elective Courses for CSS3E01

Course Code	Course Name
CSS3E01a	Computer Graphics
CSS3E01b	Introduction to Soft Computing
CSS3E01c	Web Technology
CSS3E01d	Bioinformatics
CSS3E01e	Computer Optimization Techniques
CSS3E01f	Numerical and Statistical Methods

List of Elective Courses for CSS3E02

Course Code	Course Name
CSS3E02a	Pattern Recognition
CSS3E02b	Wireless and Mobile Networks
CSS3E02c	Cryptography and Network Security
CSS3E02d	Advanced Web Technology
CSS3E02e	Virtualisation and Cloud Computing
CSS3E02f	Data Warehousing and Data Mining

SEMESTER IV

No	Course Code	Course Name	C	Weightage			Hrs/Week		
				I	E	T	L	P	T
4.1	CSS4E03	Elective 3	3	1	4	5	5	0	5
4.2	CSS4E04	Elective 4	3	1	4	5	5	0	5
4.3	CSS4P01	Project Requirements Analysis & Design Related Discussion	8	1	4	5	3	1	4
		Project Coding, Testing & Implementation Related Discussion					2	2	4
		Project Evaluation & Assessment					2	0	2
		Project Lab Work					0	5	5
Total Credits (Excluding Audit Course): 14							17	8	25

List of Elective Courses for CSS4E03

Course Code	Course Name
CSS4E03a	Data Compression
CSS4E03b	Pervasive Computing
CSS4E03c	System Security
CSS4E03d	Molecular Simulation and Modelling
CSS4E03e	Fundamentals of Big Data
CSS4E03f	Web Engineering

List of Elective Courses for CSS4E04

Course Code	Course Name
CSS4E04a	Digital Image Processing
CSS4E04b	Advanced Topics In Database Design
CSS4E04c	Software Development for Portable Devices
CSS4E04d	Storage Area Networks
CSS4E04e	Semantic Web
CSS4E04f	Advanced Java Programming