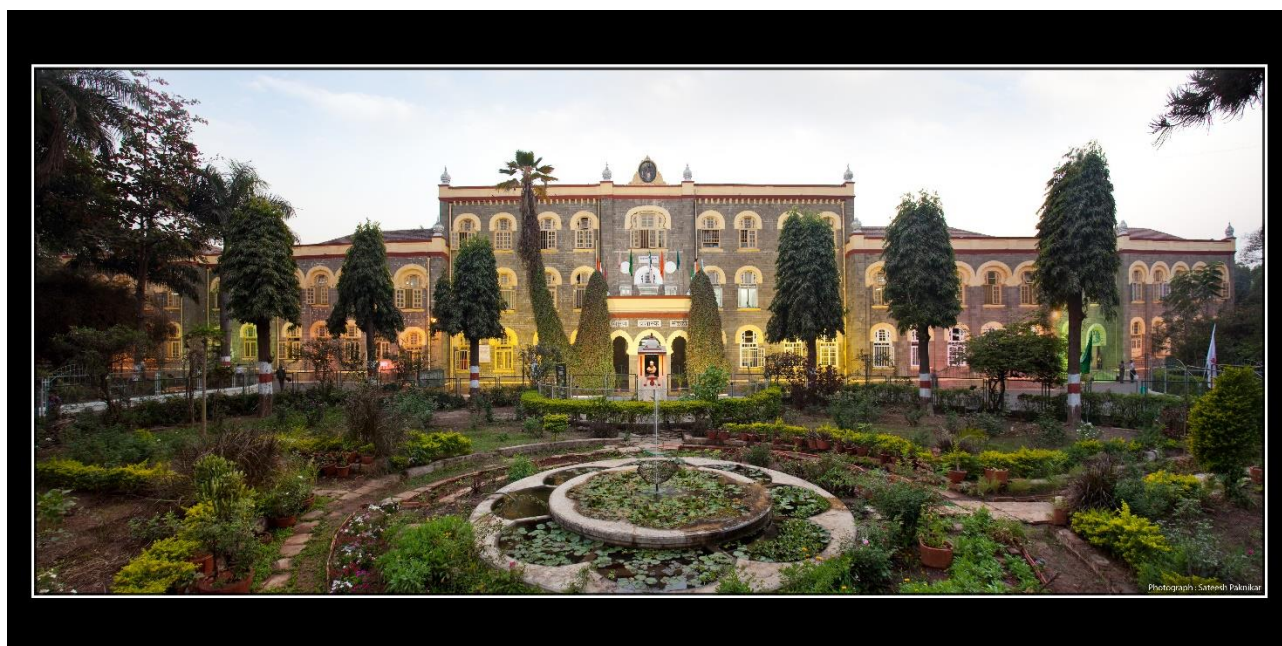


Handbook of Examination

For Choice-Based Credit System (CBCS) Under Autonomy

(Semester Pattern)

Bachelor of Science (B.Sc.) in Computer Science Program
(2019 Pattern)



Prepared by:
Board of Examinations

Sir Parashurambhau College (Autonomous), Pune

With effect from June 2019

Abbreviations

CC – Compulsory Core	T - Theory
AECC – Ability Enhancement Compulsory Course	P - Practical
SEC – Skill Enhancement Course	CIE - Continuous Internal Evaluation
DSEC – Discipline Specific Elective Course	SEE –Semester End Examination
SECC – Skill Enhancement Compulsory Course	ATKT – Allowed to keep term

Preamble

The undergraduate program in Computer Science (B.Sc. in Computer Science) aims to provide students with thorough knowledge of theoretical and practical aspects of Computer Science. The programme acknowledges the relevance of computing and information science to every academic discipline, and emphasizes exposure to interdisciplinary subjects that will drive innovation in the future. The B.Sc (Computer Science) degree course (2019 pattern) under autonomy, will be introduced in the following order:

- | | |
|---|-----------|
| a. First Year B.Sc. (Computer Sci.) | 2019-2020 |
| b. Second Year B.Sc. (Computer Sci.) | 2020-2021 |
| c. Third Year B. B.Sc. (Computer Sci.) | 2021-2022 |

SCHEME OF STUDY

1. **Title of the course:** B.Sc. (Computer Science) (2019 Pattern)
 2. **Duration of the course:** 3 years (6 semesters) full time course
 3. **Total Number of Credits:** 132
 4. **Eligibility:**
 - a. Higher Secondary School Certificate (10+2) Science Stream with Mathematics or its equivalent examination.
- OR**
- b. Three Years Diploma Course, after S.S.C. (10th standard) of Board of Technical Education conducted by Government of Maharashtra or its equivalent.
5. **Admission:** Admission to F.Y.B.Sc. (Computer Science) course will be done on the basis of merit and as per the rules and regulations stated by the Government of Maharashtra / national policy. On his/her selection for admission to B.Sc. (Computer Science) programme, the candidate shall, within the time fixed by the College, pay the tuition and other fees prescribed for the programme. If the candidate fails to pay the fees within the stipulated time, his/her admission shall automatically stand cancelled.
6. **Attendance:** 75% mandatory for each semester.
7. **Medium of instruction:** English.
8. **Duration:** The dates for the commencement and conclusion of each semester shall be declared by the institute authorities. In case of theory subjects, each semester shall consist of 15 weeks out of which 12 weeks are for teaching / active learning and 3 weeks for continuous assessment. Each Practical subject in a semester shall also be of 15 weeks out of which 14 weeks are for performing practicals and 1 week for continuous evaluation / journal certification / viva.
9. **Scheme of Study:**
 - a. The first year of B.Sc. (Computer Science) comprises of four core subjects viz. Computer Science, Electronics, Mathematics and Statistics. Each core has two theory and one practical paper.
 - b. The second year of B.Sc. (Computer Science) comprises of three core subjects viz. Computer Science, Electronics and Mathematics. Each core has two theory and one practical paper. In addition, a student has to study two AECC courses in each semester.

- c. In the third year of B.Sc. (Computer Science), a student is offered three DSEC courses and two SECC courses each semester. Every DSEC consists of three subjects. Each SECC has two elective subjects out of which a student has to select only one.
- d. Each theory lecture session shall be of **50 minutes** duration for F.Y, S.Y and T.Y.
- e. Each practical session for F.Y. shall be of **195 minutes** duration.
- f. Each practical session for S.Y. and T.Y shall be of **260 minutes duration**
- g. Semester wise structure of B.Sc. (Computer Science) program:

F.Y.B.Sc. (Computer Science) Semester I:

Course Type	Paper Code	Title of the Paper	Credits		Lectures per Week		Evaluation		
			T	P	T	P	CIA	SEE	Total
CC – I	CS11301	Computer Theory Paper I - Problem solving using Computers and ‘C’ Programming I	2	-	3	-	15	35	50
CC – II	CS11302	Computer Theory Paper II - Fundamentals of Databases I	2	-	3	-	15	35	50
CC – III	CS11303	Computer Science Practical	-	1.5	-	3hrs 15 min	15	35	50
CC – IV	MT11321	Mathematics Theory I – Discrete Maths	2	-	3	-	15	35	50
CC – V	MT11322	Mathematics Theory II – Algebra	2	-	3	-	15	35	50
CC – VI	MT11323	Mathematics Practical	-	1.5	-	3hrs 15 min	15	35	50
CC – VII	EL11331	Electronics Theory I - Semiconductor Devices and Basic Applications	2	-	3	-	15	35	50
CC – VIII	EL11332	Electronics Theory II - Digital Logic and Combinational Circuits	2	-	3	-	15	35	50
CC – IX	EL11333	Electronics Practical	-	1.5	-	3hrs 15 min	15	35	50
CC – X	ST11341	Statistics Theory I - Notion of the Statistical Data Analysis Part I	2	-	3	-	15	35	50
CC – XI	ST11342	Statistics Theory II - Basic Probability Theory and Discrete Probability Distribution	2	-	3	-	15	35	50
CC – XII	ST11343	Statistics Practical	-	1.5	-	3hrs 15 min	15	35	50
Total			16	06	24	13 hours	180	420	600

F.Y.B.Sc. (Computer Science) Semester II:

Course Type	Paper Code	Title of the Paper	Credits		Lectures per Week		Evaluation		
			T	P	T	P	CIE	SEE	Total
CC – I	CS12301	Computer Theory Paper I - Problem solving using Computers and 'C' Programming II	2	-	3	-	15	35	50
CC – II	CS12302	Computer Theory Paper II - Fundamentals of Databases II	2	-	3	-	15	35	50
CC – III	CS12303	Computer Science Practical	-	1.5	-	3hrs 15 min	15	35	50
CC – IV	MT12321	Mathematics Theory I – Graph Theory	2	-	3	-	15	35	50
CC – V	MT12322	Mathematics Theory II – Calculus	2	-	3	-	15	35	50
CC – VI	MT12323	Mathematics Practical	-	1.5	-	3hrs 15 min	15	35	50
CC – VII	EL12331	Electronics Theory I - Basics of Analog Instrumentation Systems	2	-	3	-	15	35	50
CC – VIII	EL12332	Electronics Theory II - Fundamentals of Computer Organization	2	-	3	-	15	35	50
CC – IX	EL12333	Electronics Practical	-	1.5	-	3hrs 15 min	15	35	50
CC – X	ST12341	Statistics Paper I - Notion of the Statistical Data Analysis Part II	2	-	3	-	15	35	50
CC – XI	ST12342	Statistics Paper II - Continuous Probability Distributions and Inference	2	-	3	-	15	35	50
CC – XII	ST12343	Computer Theory Paper I - Problem solving using Computers and 'C' Programming II	-	1.5	-	3hrs 15 min	15	35	50
Total			16	06	24	13 hours	180	420	600

S.Y.B.Sc. (Computer Science) Semester III:

Course Type	Course Code	Title of the Course	Credits		Lectures per Week		Evaluation		
			T	P	T	P	CI E	SEE	Total
CC – I	CS23301	Computer Sci. Theory Paper I	2	-	3	-	15	35	50
CC – II	CS23302	Computer Sci. Theory Paper II	2	-	3	-	15	35	50
CC – III	CS23303	Computer Sci. Practical Paper	-	2	-	4 hrs 20 min	15	35	50
CC – IV	MT2332 1	Mathematics Theory I	2	-	3	-	15	35	50
CC – V	MT2332 2	Mathematics Theory II	2	-	3	-	15	35	50
CC – VI	MT2332 3	Mathematics Practical Paper	-	2	-	4 hrs 20 min	15	35	50
CC – VII	EL23331	Electronics Theory I	2	-	3	-	15	35	50
CC – VIII	EL23332	Electronics Theory II	2	-	3	-	15	35	50
CC – IX	EL23333	Electronics Practical Paper	-	2	-	4 hrs 20 min	15	35	50
AECC – I	TE23351	AECC Paper I	2	-	3	-	15	35	50
AECC – II	EV23361	AECC Paper II	2	-	3	-	15	35	50
Total			16	06	24	13 hours	165	385	550

S.Y.B.Sc. (Computer Science) Semester IV:

Course Type	Course Code	Title of the Course	Credits		Lectures per Week		Evaluation		
			T	P	T	P	CIE	SEE	Total
CC – I	CS24301	Computer Sci. Theory Paper I	2	-	3	-	15	35	50
CC – II	CS24302	Computer Sci. Theory Paper II	2	-	3	-	15	35	50
CC – III	CS24303	Computer Science Practical Paper	-	2	-	4 hrs 20 min	15	35	50
CC – IV	MT24321	Mathematics Theory I	2	-	3	-	15	35	50
CC – V	MT24322	Mathematics Theory II	2	-	3	-	15	35	50
CC – VI	MT24323	Mathematics Practical Paper	-	2	-	4 hrs 20 min	15	35	50
CC – VII	EL24331	Electronics Theory I	2	-	3	-	15	35	50
CC – VIII	EL24332	Electronics Theory II	2	-	3	-	15	35	50
CC – IX	EL24333	Electronics Practical Paper	-	2	-	4 hrs 20 min	15	35	50
AECC – III	TE24351	AECC Paper III	2	-	3	-	15	35	50
AECC – IV	EV24361	AECC Paper IV	2	-	3	-	15	35	50
Total			16	06	24	13 hours	165	385	550

T.Y.B.Sc (Computer Science) Semester V:

Course Type	Course Code	Title of the Course	Credits		Lectures per Week		Evaluation		
			T	P	T	P	CIE	SEE	Total
DSEC – I	CS35301	Computer Sci. Paper I	2	-	3	-	15	35	50
	CS35302	Computer Sci. Paper II	2	-	3	-	15	35	50
	CS35303	Computer Sci. Practical I	-	2	-	4 hrs 20 min	15	35	50
DSEC – II	CS35304	Computer Sci. Paper III	2	-	3	-	15	35	50
	CS35305	Computer Sci. Paper IV	2	-	3	-	15	35	50
	CS35306	Computer Sci. Practical II	-	2	-	4 hrs 20 min	15	35	50
DSEC – II	CS35307	Computer Sci. Paper V	2	-	3	-	15	35	50
	CS35308	Computer Sci. Paper VI	2	-	3	-	15	35	50
	CS35309	Computer Sci. Practical III	-	2	-	4 hrs 20 min	15	35	50
SECC – III	SK35371	Skill Enhancement Paper I	1	1	1.5	2 hrs 10 min	15	35	50
SECC – IV	SK35372	Skill Enhancement Paper II	1	1	1.5	2 hrs 10 min	15	35	50
Total			14	8	21	15 hrs 10 min	165	385	550

T.Y.B.Sc (Computer Science) Semester VI:

Course Type	Course Code	Title of the Course	Credits		Lectures per Week		Evaluation		
			T	P	T	P	CIE	SEE	Total
DSEC – IV	CS36301	Computer Sci. Paper VII	2	-	3	-	15	35	50
	CS36302	Computer Sci. Paper VIII	2	-	3	-	15	35	50
	CS36303	Computer Sci. Practical IV	-	2	-	4 hrs 20 min	15	35	50
DSEC – V	CS36304	Computer Sci. Paper IX	2	-	3	-	15	35	50
	CS36305	Computer Sci. Paper X	2	-	3	-	15	35	50
	CS36306	Computer Sci. Practical V	-	2	-	4 hrs 20 min	15	35	50
DSEC – VI	CS36307	Computer Sci. Paper IX	2	-	3	-	15	35	50
	CS36308	Computer Sci. Paper X	2	-	3	-	15	35	50
	CS36309	Computer Sci. Practical V	-	2	-	4 hrs 20 min	15	35	50
SECC – III	SK36371	Skill Enhancement Paper III	1	1	1.5	2 hrs 10 min	15	35	50
SECC – IV	SK36372	Skill Enhancement Paper IV	1	1	1.5	2 hrs 10 min	15	35	50
Total			14	8	21	15 hrs 10 min	165	385	550

Non-CGPA credit points

In addition to credits above, students have to earn eight additional credits (Non-CGPA) from following groups.

Group no	Activity	Sem	Credits
1 (Compulsory)	Physical Education	I	1
		II	1
2	Sports College level	I-VI	1
	University /state/National level/ International Level		2
3	NSS (Participation in camp)	I-VI	1
	NCC (participation in annual camp)		1
	NCC (B or C certificate)		2
	NSS/NCC(RD parade)		4
4	Avishkar Participation - College level	I-VI	1
	University level/State level		2
	Winner at state level		4
	Extension activity Participation		1
	Cultural activity Participation		1
5	Research paper presentation at State/National level conference/ seminar	I-VI	1
	International level conference/ seminar		2
	Software Project		2
6	Participation in Summer school (minimum one week) or	I-VI	3
	Short term course (minimum one week)		3
7	Scientific survey /Societal survey	I-VI	2
8	Field visit/study tour/Industrial visit/curricular competition/co-curricular competition	I-VI	1
9	Online Certificate course/MOOCs/Career advancement course (10hrs/credit)/Internship (60 hrs)	I-VI	Up to 4 credits

10. Scheme of examination:

All the credits taken together of a particular course will be evaluated in two parts - CIE and SEE. Weightage for CIE would be 15 marks internal assessment and 35 marks for SEE.

The CIE towards 15 marks will be a continuous activity with one written test. The CIE evaluation pattern is given below.

Evaluation for Theory Paper for the subject of Computer Science

Internal CIE: 15 Marks

Sr. No.	Particulars	Marks
1	Internal Examination (Duration : 40 Minutes)	10
2	<i>Any one of the following:</i> Active Participation in Course Work, Compulsory Assignments, Quiz, Seminars/Presentations, Projects, Assignments, Tutorials, Oral examination, Open book test, Group discussion	5
	Total	15

External Examination (SEE): 35 marks

Duration: 2 Hours

Evaluation for Practical Paper for the subject of Computer Science

Continuous Internal Evaluation (CIE): 15 Marks

Sr. No.	Particulars	Marks
1	Work book	10
2	Active Participation	5
	Total	15

External Assessment: 35 marks

Format of Semester end Practical Exam

Duration: 3 Hours

Sr. No.	Particulars	Total Marks
1	Section I	15
2	Section II	15
3	Viva	5
	Total	35

11. Standard Of Passing:

- Student must pass 50% of the core subjects opted for the semester.
- Minimum marks required to pass an examination is 40%. Out of that student must obtain minimum 30% marks in CIE and 40% marks in SEE for all subjects. For example, for a course of 2 credits, a student must obtain minimum 20 marks provided he/she secures minimum 5 marks in CIE and 14 marks in SEE. It means there is separate passing for CIE and SEE.
- Student who fails in CIE of any odd semester can reappear for the same only in next odd semester and same for even semester. For eg. a student who fails in the 1st semester can reappear in 3rd semester only and students who fail in the 2nd semester can reappear in 4th semester only.
- If the student does not secure 40% in the total assessment but has secured the minimum passing requirement i.e. 30% marks in CIE and minimum 40% marks in SEE, he/she would be permitted to appear for anyone of or both of CIE and SEE.

12. Rules for A.T.K.T

- Minimum number of credits required to take admission to S. Y. B. Sc. (Computer Sci.) are 22 (50% of the total credits for F. Y. B. Sc. (Computer Sci.))
- Minimum number of credits required to take admission to T. Y. B. Sc. (Computer Sci.) are 44 credits (100% credits) from F. Y. B. Sc. (Computer Sci.) and at least 22 credits from S. Y. B. Sc. (Computer Sci.) (50% credits from S. Y. B. Sc. (Computer Sci.))

13. Verification And Revaluation:

A candidate may apply for verification and revaluation of result, which will be done by the college as per ordinance framed in that behalf.

14. Calculation of SGPA and CGPA:

SGPA stands for Semester Grade Point Average. The performance of a student in particular semester is given by **SGPA**. It can be calculated by the sum of total grade point divided by credit of total subject.

$$SGPA = \Sigma \frac{\text{Grade point earned X credits for each course}}{\text{TotalCredits}}$$

CGPA is the **calculation** of the cumulative grade point average value obtained by the student in all the subjects. The Grade Points obtained in all the subjects' are **calculated** along with the total number of credit hours the student has attempted.

$$CGPA = \Sigma \frac{\text{Grade point earned X credits for each course}}{\text{TotalCredits}}$$

15. Conversion of Marks into credit(s) and grade(s):

The following illustrations could be taken as an example for computing SGPA and CGPA from percentage to credits in all disciplines, for the degree program in B.Sc.(Computer Science).

The following formula may be used to convert (%) into Grade Letter

Sr. No	Grade Letter	Grade Point	Marks
1	O (Outstanding)	10	$90 \leq \text{Marks} \leq 100$
2	A+(Excellent)	9	$75 \leq \text{Marks} \leq 89$
3	A (Very Good)	8	$60 \leq \text{Marks} \leq 74$
4	B+(Good)	7	$55 \leq \text{Marks} \leq 59$
5	B (Above Average)	6	$50 \leq \text{Marks} \leq 54$
6	C (Average)	5	$45 \leq \text{Marks} \leq 49$
7	D (Pass)	4	$40 \leq \text{Marks} \leq 44$
8	F (Fail)	0	Marks <40