

## **Annexure – II**

### **Structure/Pattern of Syllabus**

#### **1) Title of the Programme**

The Title of the Programme is Bachelor of Computer Applications (BCA)

#### **2) Preamble of the syllabus**

The B.C.A. program is a combination of computer and applied courses from science stream. The computer related courses introduce techniques of programming, databases, web designing, system analysis, design tools and different computing environments. The applied courses include mathematics, statistics and electronics that provide theoretical foundation for the learner.

#### **Objectives:**

- To produce knowledgeable and skilled human resources that is employable in IT and ITES.
- To impart knowledge required for planning, designing and building Complex Application Software Systems as well as to provide support for automated systems or applications.
- To produce entrepreneurs

#### **3) Introduction**

The Program is of Three Years duration with six semesters. It is a Full Time Degree Program. The program will be based on Choice-based credit system comprising 140 credit points.

#### **4) Eligibility**

Any candidate who has passed the XII standard Examination in Science stream from Maharashtra State Board of Secondary and Higher Secondary Education or equivalent Board of Examination, is eligible for admission to the First Year of this program.

**OR**

Any candidate who has passed any three Year Diploma Course approved by the DTE, Maharashtra State or Equivalent authority is eligible for admission to the First Year of this program.

## **Lateral Entry to SYBCA**

Any candidate who has passed three Year Diploma course in Computer Engineering/Technology/Information Technology approved by the DTE, Maharashtra State or Equivalent authority with First Class is eligible for admission to direct second year (SYBCA) of this program.

### **5) Examination**

#### **5A) Pattern of examination:**

- For theory courses, continuous evaluation of 30 marks will be carried out in the form of tests/assignments/quiz/presentations etc. End semester Theory examination of 70 marks will be conducted by the University.
- Continuous evaluation for each laboratory course will be carried out throughout the semester. Practical examination of 35 marks, wherever applicable, will be conducted by pair of two examiners appointed by the University at the end of the semester.

#### **END SEMESTER Theory Question Paper:**

- Question paper for every theory course will have only one section with six questions, one for each unit.
- Questions based on any four out of six units will be of 12 marks and the remaining two questions will be of 11 marks
- For each question there will be OPTIONAL Question based on same unit and of same marks. Each question may have 2/3 sub-questions.
- A panel of teachers appointed by the University will draw three distinct question paper sets

#### **Assessment**

- Assessment of Theory and laboratory courses for End-Semester Examination will be carried out by the examiners appointed by university. For laboratory courses, appointed examiners will prepare the mark/grade sheet in the format as specified by the University, authenticate and seal it and submit with the University office.
- Continuous assessment for theory courses may be based on tests/assignments/quiz etc. Continuous assessment for laboratory courses may be based on work done, submission of work in the form of report/journal, timely completion, attendance, and understanding etc.

- Continuous assessment for theory and lab courses should be assessed by course teacher of the institute for first to sixth semesters. At the end of the semester, the final grade for the continuous assessment shall be assigned based on the performance of the student and is to be submitted to the University. A student who fails in the continuous assessment on account of unsatisfactory performance shall be given F grade and on the account of inadequate attendance shall be given FX grade. Course teacher will prepare the mark/grade sheet in the format as specified by the University, authenticate and seal it and submit with the University office.

### 5B) Standard of Passing

- To pass the theory or laboratory course, the student has to earn Minimum of 40% of Maximum marks assigned for the course, provided the student has earned at least 40% of maximum marks assigned for end-semester examination of the course.
- To earn credits of a course (Theory/Laboratory) student must pass the course as stated above.

### 5B1 Marks/Grade/Grade Point

A grade is assigned to each head of examination based on marks obtained by a student in examination of the course. The marks obtained in Continuous Evaluation and end-semester examination are considered together to calculate the grade of the course. These grades, their equivalent grade points are given in Table 8.

**TABLE 8 Grade and Grade Point**

<b>Grade</b>	<b>Grade Point</b>	<b>Percentage of Marks Obtained</b>	<b>Remarks</b>
O	10	90-100	Outstanding
A	9	80-89	Very Good
B	8	70-79	Good
C	7	60-69	Fair
D	6	50-59	Average
E	5	40-49	Below Average
F	0	Below 40	Fail
FX	0	--	Detained, Repeat the Course
IC	0	--	Incomplete Course-- Absent for Exam but continue for the course

### 5B2 Passing Grade:

- The grades O, A, B, C, D, E are passing grades.
- A candidate acquiring any one of these grades in a course shall be declared as PASS and shall earn the credits assigned for a course.
- A candidate acquiring grade F in a course shall be declared as FAIL and shall not earn any credits assigned for a course. Such candidate will have to pass the concerned course by re-appearing for the examination.
- The grade FX in a course is awarded by the college, if a student does not maintain the minimum attendance in the Lecture / Tutorial class as prescribed by the University and/or his performance during the semester is not satisfactory and/or he/she fails in the Term Work head of that course.
- The student with FX grade in a given course is not permitted to take the end of semester examination in that course. Such a student will have to re-register for the course and shall be awarded with PP/NP grades.
- The student with F / FX in a course shall not be awarded any credits for that course.

### 5B3 Performance Indices:

The semester end grade sheet will contain grades for the courses along with titles of the courses and SGPA.

Final grade sheet and transcript shall contain CGPA.

**5B3.1 SGPA** -The performance of a student in a semester is indicated by a number called the Semester Grade Point Average (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses registered by the student during the semester.

$$\text{Semester Grade Point Average (SGPA)} = \frac{\sum_{i=1}^p C_i G_i}{\sum_{i=1}^p C_i}$$

$$\text{SGPA} = \frac{\sum \text{Grade Points Earned X Credits For Each Course}}{\text{Total Credits}}$$

For Example: suppose in a given semester a student has registered for five courses having credits C1, C2, C3, C4, C5 and his / her grade points in those courses are G1, G2, G3, G4, G5 respectively.

Then

$$\text{SGPA} = \frac{C_1 G_1 + C_2 G_2 + C_3 G_3 + C_4 G_4 + C_5 G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

SGPA is calculated up to two decimal places by rounding off.

**5B3.2 CGPA-** The CGPA is the weighted average of the grade points obtained in all the courses (Theory/term work/practical/oral) from first semester to sixth semester and from third semester to sixth semester, in case of directly admitted students at second year. It is calculated in the same manner as the SGPA stated above.

In case a student who passes a course that he/she was failed earlier or in case of improvement, the earlier grade would be replaced by the new grade in calculation of the SGPA and CGPA.

### **5C) ATKT (Allowed To Keep Term) Rules**

- A student can register for the third semester (SYBCA), if he/she earns minimum 50% credits of the total credits of first and second semesters (FYBCA).
- A student can register for the fifth semester (TYBCA), if he/she earns minimum 50% credits of the total credits of third and fourth semesters (SYBCA) and earns all the credits of first and second semester (FYBCA).
- A student will be awarded the bachelor's degree if he/she earns 140 credits

### **5D) Award of Class**

Based on the performance of the student in the semester examinations, the University will declare the results and issue the Semester Grade sheets.

The class shall be awarded to a student on the CGPA calculated. The award of the class shall be as per Table 9.

**Table 9 CGPA and Class awarded**

<b>Sr. No.</b>	<b>CGPA</b>	<b>Class of the Degree Awarded</b>
1.	7.75 or More than 7.75	First Class with Distinction
2.	6.75 or more but less than 7.75	First Class
3.	6.25 or more but less than 6.75	Higher Second Class
4.	5.5 or more but less than 6.25	Second Class

### **5E) External Students:**

- This being a 3 years, six semesters full time degree program, external students are not permitted.

## 5F) Setting of Question paper / Pattern of Question paper :

- The BOE shall make appointment of Chairman/Paper setters for end-semester examination of theory and laboratory courses. The appointed Chairman/Paper Setters shall set three distinct question paper sets as per the nature of question paper outlined in section 5A above.

## 5G) Verification / Revaluation

- Student can only apply for the verification/revaluation/Photocopying of End-Semester examination for theory courses only.

## 6) Structure of the Course

The B. C. A. programme is of 3 years duration. The minimum total number of credit requirement for the programme is 140 credit points. The credits are distributed over 6 semesters. The structure includes core theory and lab courses, Ability Enhancement Theory and lab Courses, Department Specific Elective Theory and Lab Courses and skill-enhancement theory courses. The Credit structure is given below in Table 1.

Table 1: Credit Structure for BCA Programme

Course Types	Credits						Total
	Semester_1	Semester_2	Semester_3	Semester_4	Semester_5	Semester_6	
Core Theory Courses	16	16	12	12	---	---	56
Ability Enhancement Theory Courses	---	---	04	04	---	---	08
Department Specific Elective Theory Courses	---	---	---	---	12	12	24
Skill Enhancement Theory Courses	---	---	---	---	04	04	08
Core Lab Courses	06	06	06	06	---	---	24
Ability Enhancement Lab Courses	---	---	---	---	---	---	---
Department Specific Elective Lab Courses	---	---	---	---	06	06	12
<b>Total</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>132</b>

### Note:

- Semester 1 and semester 2 will be part of First Year of BCA (FYBCA)
- Semester 3 and semester 4 will be part of Second Year of BCA (SYBCA)
- Semester 5 and semester 6 will be part of Third Year of BCA (TYBCA)

Semester wise programme structure is provided for semesters 1, 2, 3, 4, 5 and 6 is as shown in Tables 2, 3, 4, 5, 6 and 7 respectively.

**In addition to the compulsory credits of 132, the student has to earn additional 8 credits from following groups by taking/participating / conducting respective activities.**

**Courses in Group 1 are compulsory.**

The student can earn **maximum 04 credits** from an individual group from Group 2 to 9.

**The extra credits will not be considered for CGPA calculation; however these are mandatory for the completion and award of B. Sc. Degree.**

- **Group 1:** Physical Education (at F. Y. B. Sc. Sem. I) 01 Credit  
Physical Education (at F. Y. B. Sc. Sem. II) 01Credit  
(Note: Group 1 is compulsory for all the students as stated above.)
- **Group 2:** Sport representation at College level - 01 Credit  
Sport representation at University/ State level - 02 Credits
- **Group 3:** National Social Service Scheme (participation in Camp): 01 Credit  
N.C.C. (with participation in annual camp) - 01 Credit  
N.C.C. (with B or C certificate award) – 02 Credits  
N.S.S/ NCC Republic day parade participation–04Credits
- **Group 4:** Avishkar participation; Extension activity participation,  
cultural activity participation - 01 Credit  
Avishkar selection at University Level – 02 Credits  
Avishkar winner at state Level – 04 Credits
- **Group 5:** Research paper presentation at State/National Level - 01 Credit  
Research paper presentation at International Level - 02 Credits
- **Group 6:** Participation in Summer school/Programme; Short term course (not  
less than 1-week duration) - 03 Credits
- **Group 7:** Scientific Survey, Social survey, Internships in Industry for 2/3  
weeks (strictly during winter or summer vacations during SY or  
TYBCA with certificate from Industry) - 02 Credits.
- **Group 8:** Field Visits; Study Tours; Industrial Visits; Participation in curricular/  
co-curricular Competitions – 01 Credit
- **Group 9:** Online certificate Courses / MOOC Courses/ Career Advancement  
course up to 04 Credits (min 10Hrs/Credit)

**TABLE -2 Structure for FYBCA (Semester\_1)**

<b>Savitribai Phule University of Pune</b> <b>First Year of Bachelor of Computer Applications (2019 Course)</b> <b>(with effect from June 2019-20)</b>									
<b><u>Semester 1</u></b>									
<b>Course Code</b>	<b>Course</b>	<b>Teaching Scheme Hours / Week</b>			<b>Examination Scheme and Marks</b>			<b>Credit</b>	
		<b>Theory</b>	<b>Tutorial</b>	<b>Practical</b>	<b>CE</b>	<b>End-Sem</b>	<b>Total</b>	<b>TH</b>	<b>PR</b>
BCA101	Fundamentals of Computers	04	--	--	30	70	100	04	--
BCA102	Problem Solving and Programming in C	04	--	--	30	70	100	04	--
BCA103	Applied Mathematics	04	--	--	30	70	100	04	--
BCA104	Business Communication	04	--	--	30	70	100	04	--
BCA105	Fundamentals of Computers Lab	--	--	03	15	35	--	50	1.5
BCA106	C Programming Lab	--	--	03	15	35	--	50	1.5
BCA107	Applied Mathematics Lab	--	--	03	50	---	--	50	1.5
BCA108	Business Communication Lab	--	--	03	50	---	--	50	1.5
<b>Total Credits</b>								<b>16</b>	<b>06</b>
<b>Total</b>		<b>16</b>	<b>--</b>	<b>12</b>	<b>250</b>	<b>350</b>	<b>600</b>	<b>22</b>	

**Abbreviations:**

**TW:** Term Work

**TH:** Theory

**OR:** Oral

**TUT:** Tutorial

**PR:** Practical

**TABLE -3 Structure for FYBCA (Semester\_2)**

<b>Savitribai Phule University of Pune</b> <b>First Year of Bachelor of Computer Applications (2019 Course)</b> <b>(with effect from June 2019-20)</b>									
<b><u>Semester 2</u></b>									
<b>Course Code</b>	<b>Course</b>	<b>Teaching Scheme Hours / Week</b>			<b>Examination Scheme and Marks</b>			<b>Credit</b>	
		<b>Theory</b>	<b>Tutorial</b>	<b>Practical</b>	<b>CE</b>	<b>End-Sem</b>	<b>Total</b>	<b>TH</b>	<b>PR</b>
BCA201	Computer Organization	04	--	--	30	70	100	04	--
BCA202	Advanced Programming in C	04	--	--	30	70	100	04	--
BCA203	Linux	04	--	--	30	70	100	04	--
BCA204	Database Management & Applications	04	--	--	30	70	100	04	--
BCA205	Computer Organization Lab	--	--	03	50	--	050	--	1.5
BCA206	Advanced C Programming Lab	--	--	03	15	35	050	--	1.5
BCA207	Linux Lab	--	--	03	50	---	050	--	1.5
BCA208	Database Management & Applications Lab	--	--	03	15	35	050	--	1.5
<b>Total Credits</b>								<b>16</b>	<b>06</b>
<b>Total</b>		<b>16</b>	<b>--</b>	<b>12</b>	<b>250</b>	<b>350</b>	<b>600</b>	<b>22</b>	

**TABLE -4 Structure for SYBCA (Semester 3)**

Savitribai Phule University of Pune Second Year of Bachelor of Computer Applications (2019 Course) (with effect from June 2020 - 21)									
<u>Semester 3</u>									
Course Code	Course	Teaching Scheme Hours / Week			Examination Scheme and Marks			Credit	
		Theory	Tutorial	Practical	CE	End-Sem	Total	TH	PR
BCA301	Core Course - I	04	--	--	30	70	100	04	--
BCA302	Core Course – II	04	--	--	30	70	100	04	--
BCA303	Core Course - III	04	--	--	30	70	100	04	--
BCA304	Core Course – I Lab	--	--	04	15	35	050	--	02
BCA305	Core Course – II Lab	--	--	04	15	35	050	--	02
BCA306	Core Course –III Lab	--	--	04	50	---	050	--	02
EVS-231	AEC Course – Environmental Science -I	02	--	--	15	35	050	02	---
LA-231	AEC Course – Language -I	02	--	--	15	35	050	02	---
<b>Total Credits</b>								<b>16</b>	<b>06</b>
<b>Total</b>		<b>16</b>	<b>--</b>	<b>12</b>	<b>200</b>	<b>350</b>	<b>550</b>	<b>22</b>	

**AEC: Ability Enhancement Compulsory**

**TABLE -5 Structure for SYBCA (Semester\_4)**

<b>Savitribai Phule University of Pune</b> <b>Second Year Computer Applications (2019 Course)</b> <b>(with effect from June 2020 - 21)</b>									
<b><u>Semester 4</u></b>									
<b>Course Code</b>	<b>Course</b>	<b>Teaching Scheme Hours / Week</b>			<b>Examination Scheme and Marks</b>			<b>Credit</b>	
		<b>Theory</b>	<b>Tutorial</b>	<b>Practical</b>	<b>CE</b>	<b>End-Sem</b>	<b>Total</b>	<b>TH</b>	<b>PR</b>
BCA401	<b>Core Course – IV</b>	04	--	--	30	70	100	04	--
BCA402	<b>Core Course – V</b>	04	--	--	30	70	100	04	--
BCA403	<b>Core Course - VI</b>	04	--	--	30	70	100	04	--
BCA404	<b>Core Course – IV Lab</b>	--	--	04	15	35	050	--	02
BCA405	<b>Core Course – V Lab</b>	--	--	04	15	35	050	--	02
BCA406	<b>Core Course –VI Lab</b>	--	--	04	50	---	050	--	02
EVS-241	<b>AEC Course – Environmental Science -II</b>	02	--	--	15	35	050	02	---
LA-241	<b>AEC Course – Language -II</b>	02	--	--	15	35	050	02	---
<b>Total Credits</b>								<b>16</b>	<b>06</b>
<b>Total</b>		<b>16</b>	<b>--</b>	<b>12</b>	<b>200</b>	<b>350</b>	<b>550</b>	<b>22</b>	

**AEC: Ability Enhancement Compulsory**

**TABLE -6 Structure for TYBCA (Semester\_5)**

Savitribai Phule University of Pune Third Year Computer Applications (2019 Course) (with effect from June 2021 - 22)									
<u>Semester 5</u>									
Course Code	Course	Teaching Scheme Hours /			Examination Scheme and Marks			Credit	
		Theory	Tutorial	Practical	CE	End-Sem	Total	TH	PR
BCA501	DSE Course – I	04	--	--	30	70	100	04	--
BCA502	DSE Course – II	04	--	--	30	70	100	04	--
BCA503	DSE Course – III	04	--	--	30	70	100	04	--
BCA504	DSE Course – I Lab	--	--	04	15	35	050	--	02
BCA505	DSE Course – II Lab	--	--	04	15	35	050	--	02
BCA506	DSE Course –III Lab	--	--	04	50	--	050	--	02
BCA507	SE Course – I	02	--	--	15	35	050	02	--
BCA508	SE Course – II	02	--	--	15	35	050	02	--
<b>Total Credits</b>								<b>16</b>	<b>06</b>
<b>Total</b>		<b>16</b>	<b>--</b>	<b>12</b>	<b>200</b>	<b>350</b>	<b>550</b>	<b>22</b>	

**DSE : Department Specific Elective    SE: Skill Enhancement**

**TABLE -7 Structure for TYBCA (Semester\_6)**

Savitribai Phule University of Pune Third Year Computer Applications (2019 Course) (with effect from June 2021-22)									
<u>Semester 6</u>									
Course Code	Course	Teaching Scheme Hours / Week			Examination Scheme and Marks			Credit	
		Theory	Tutorial	Practical	CE	End-Sem	Total	TH	PR
BCA601	DSE Course – IV	04	--	--	30	70	100	04	--
BCA602	DSE Course – V	04	--	--	30	70	100	04	--
BCA603	DSE Course – VI	04	--	--	30	70	100	04	--
BCA604	DSE Course – IV Lab	--	--	04	15	35	050	--	02
BCA605	DSE Course – V Lab	--	--	04	15	35	050	--	02
BCA606	DSE Course –VI Lab	--	--	04	50	--	050	--	02
BCA607	SE Course – III	02	--	--	15	35	050	02	--
BCA608	SE Course – IV	02	--	--	15	35	050	02	--
<b>Total Credits</b>								<b>16</b>	<b>06</b>
<b>Total</b>		<b>16</b>	<b>--</b>	<b>12</b>	<b>200</b>	<b>350</b>	<b>550</b>	<b>22</b>	

**DSE : Department Specific Elective    SE: Skill Enhancement**

**6d) Medium of Instructions:**

The medium of instructions is English

## 7) Equivalence of previous syllabus along with propose syllabus:

2016 Pattern		2019 Pattern	
Course Code	Course Name	Course Code	Course Name
<b>Semester I</b>			
BCA101	Fundamentals of Computer	BCA101	Fundamentals of Computer
BCA102	Basic Programming in C	BCA102	Problem Solving and Programming in C
BCA103	Applied Mathematics- I	<b>To be Continued</b>	
BCA104	Communication Skills	BCA104	Business Communication
BCA105	Lab I	<b>To be Continued</b>	
BCA106	Lab II	<b>To be Continued</b>	
<b>Semester II</b>			
BCA201	Computer Organization	BCA201	Computer Organization
BCA202	Advanced Programming in C	BCA202	Advanced Programming in C
BCA203	Applied Mathematics- II	<b>To be Continued</b>	
BCA204	RDBMS	BCA204	Database Management & Applications
BCA205	Lab I	<b>To be Continued</b>	
BCA206	Lab II	<b>To be Continued</b>	

## 8) University terms:

### 9) Subject wise Detail Syllabus:

The detail draft of each of the courses at FYBCA is provided in Appendix VI. For each course, the Course code, title, Lecture/lab scheme, Examination Scheme, pre-requisite course(s) if any, companion course(s) if any, the course objectives and course outcomes are provided. Each course contents are divided into six units. For each unit the title, topics and subtopics are provided with desired number of lectures to be conducted are provided.

### 10) Recommended books:

List of recommended books are mentioned at the end of detailed contents of each of the courses in the "Reference Books" section.

**11) Qualification of Teacher:** As per norms prescribed by the UGC/University/Higher education

## 12. References

[1] [https://www.ugc.ac.in/ugc\\_notices.aspx?id=2096](https://www.ugc.ac.in/ugc_notices.aspx?id=2096) )

[2] [https://www.ugc.ac.in/pdfnews/4598476\\_LOCF-UG.pdf](https://www.ugc.ac.in/pdfnews/4598476_LOCF-UG.pdf)

[3] <https://www.ugc.ac.in/page/Model-Curriculum.aspx>