

**BHARATI VIDYAPEETH UNIVERSITY, PUNE**  
**COURSE STRUCTURE AND SYLLABUS OF**  
**THREE YEARS INTEGRATED**  
**CHOICE BASED CREDIT AND GRADING SYSTEM (CBCS – 2018 COURSE)**  
**TO BE IMPLEMENTED FROM JUNE 2018**  
**FOR THREE YEARS**  
**BACHELOR OF SCIENCE (B.SC.) DEGREE COURSE**

The Bachelor of Science (B.Sc.) degree of three years integrated choice based credit and grading system (CBCS-2018) course is being implemented from the academic year 2018-2019. Thus, first year B.Sc. CBCS-2018 course will commence from 2018-2019 and will be implemented in successive years.

**Objectives of the Course:-**

The objectives of the B.Sc. (CBCS-2018) Course shall be to:-

1. offer choice to the students in the curriculum to have freedom in selecting his / her own choice in completing UG program.
2. introduce the activities which support the curriculum such as seminars, field trips, discussion etc.
3. mix different learning environments such as traditional face to face classroom method with modern computer mediated activities.
4. develop the human resource for industry as well as education sector which is the need of hour.
5. create several self-employment opportunities in various fields of science.
6. develop the skills necessary in the chemical, pharmaceutical, analytical, agriculture, technology fields.
7. inculcate scientific temper among the students.

**ELIGIBILITY FOR ADMISSION :**

1. Higher Secondary School Certificate Examination (10+2) of the Maharashtra State Board or its equivalent examination of any other statutory Board/University with English and with any three Science subjects such as (i) Physics (ii) Chemistry (iii) Biology (iv) Mathematics (v) Geography (vi) Geology etc

2. Higher Secondary School Certificate Examination (10+2) with English and with any one of the following vocational subjects in technical group of +2 levels.
3. Diploma in Pharmacy, Diploma in Engineering (polytechnic) or its equivalent examination recognized by MBTE, Mumbai or its equivalent of any other statutory Board or University.

Subject code	Subject
79	Auto Electrical
A1	Electrical Maintenance
A2	Mechanical Maintenance
A4	General Civil Engg.
C2	Electronics
C3	Chemical Plant Operation
C5	Elementary Laboratory Technology
D9	Computer Science
J1/J2/J3	Electronics Technology
J4/J5/J6	Maintenance & Repairs of Electrical Domestic Appliances
K1/K2/K3	Auto Engg. Technician
P1/P2/P3	Medical Lab. Technician
P4/P5/P6	X-ray Technician
P7/P8/P9	Ophthalmic Technician
T1/T2/T3	Repair, Maintenance & Rewinding of Electrical Motors.

**Admission process:**

1. 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.
2. Reservation and relaxation will be as per the Government rules and Bharati Vidyapeeth University, Pune.

**Intake Capacity:** The intake capacity of the course will be 120 seats every year.

## F. Y. B. Sc. (Sem. I and II)

### CORE SELECTIVE GROUPS (SELECT ANY ONE GROUP FROM THE FOLLOWING)

Group I :- Physics, Chemistry, Mathematics and Statistics (PCMS)

Group II :- Physics, Mathematics, Statistics and Computer Application (PMSCA)

Group III :- Physics, Chemistry, Botany and Zoology (PCBZ)

Group IV :- Chemistry, Botany, Zoology and Microbiology (CBZM)

Group V: - Chemistry, Zoology, Microbiology and Geography (CZMG)

### 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 IA	University Examination UE	Total
<b>Core Course</b>		<b>Physics</b>						
	P - 11	Mechanics & Properties of Matter	03	03	03	40	60	100
	P - 12	Modern Physics	03	03	03	40	60	100
	P - 13	Practical course – I	04	02	03	40	60	100
<b>Core Course</b>		<b>Chemistry</b>						
	C-11	Physical and Inorganic Chemistry – I	03	03	03	40	60	100
	C-12	Organic and Inorganic Chemistry – I	03	03	03	40	60	100
	C -13	Practical course – I	04	02	03	40	60	100
<b>Core Course</b>		<b>Botany</b>						
	B –11	Plant diversity and utilization of plants – I	03	03	03	40	60	100
	B –12	Cell biology	03	03	03	40	60	100
	B - 13	Practical course - I	04	02	03	40	60	100
<b>Core Course</b>		<b>Zoology</b>						
	Z – 11	Animal systematic and Functional Anatomy of Non-chordates-I	03	03	03	40	60	100
	Z –12	Cell Biology and Genetics	03	03	03	40	60	100

Subject Type	Code	Title of the paper	Hrs/Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment IA	University Examination UE	Total
	Z- 13	Practical course - I	04	02	03	40	60	100
<b>Core Course</b>		<b>Microbiology</b>						
	MB-11	Introduction to Microbiology	03	03	03	40	60	100
	MB-12	Structure of Prokaryotes and Eukaryotes	03	03	03	40	60	100
	MB-13	Practical course - I	04	02	06	40	60	100
<b>Core Course</b>		<b>Mathematics</b>						
	M-11	Algebra	03	03	03	40	60	100
	M-12	Calculus	03	03	03	40	60	100
	M - 13	Practical course - I	04	02	03	40	60	100
<b>Core Course</b>		<b>Statistics</b>						
	S-11	Descriptive Statistics - I	03	03	03	40	60	100
	S-12	Discrete Probability and Probability Distributions -I	03	03	03	40	60	100
	S- 13	Practical course - I	04	02	03	40	60	100
<b>Core Course</b>		<b>Geography</b>						
	G -11	Physical Geography - I	03	03	03	40	60	100
	G - 12	Climatology - I	03	03	03	40	60	100
	G- 13	Practical course - I	04	02	03	40	60	100
<b>Core Course</b>		<b>Computer Application</b>						
	CA-11	Computer Fundamentals	03	03	03	40	60	100
	CA-12	Programming in C -I	03	03	03	40	60	100
	CA- 13	Practical course - I	04	02	03	40	60	100

## 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 IA	University Examination UE	Total
<b>Core Course</b>		<b>Physics</b>						
	P - 21	Kinetic Theory & Thermodynamics	03	03	03	40	60	100
	P -22	Electricity & Magnetism	03	03	03	40	60	100
	P - 23	Practical course - II	04	02	03	40	60	100
<b>Core Course</b>		<b>Chemistry</b>						
	C-21	Physical and Inorganic Chemistry – II	03	03	03	40	60	100
	C-22	Organic and Inorganic Chemistry - II	03	03	03	40	60	100
	C - 23	Practical Course-II	04	02	03	40	60	100
<b>Core Course</b>		<b>Botany</b>						
	B –21	Plant diversity and utilization of plants – II	03	03	03	40	60	100
	B –22	Industrial Botany-I	03	03	03	40	60	100
	B - 23	Practical course – II	04	02	03	40	60	100
<b>Core Course</b>		<b>Zoology</b>						
	Z – 21	Functional Anatomy of Chordates-I	03	03	03	40	60	100
	Z – 22	Applied zoology (Vermiculture and Sericulture)	03	03	03	40	60	100
	Z- 23	Practical course – II	04	02	03	40	60	100
<b>Core Course</b>		<b>Microbiology</b>						
	MB-21	Microbial Nutrition, Growth and control	03	03	03	40	60	100
	MB-22	The diversity of Microbial World	03	03	03	40	60	100
	MB- 23	Practical course – II	04	02	06	40	60	100
<b>Core Course</b>		<b>Mathematics</b>						
	M-21	Analytical Geometry	03	03	03	40	60	100
	M-22	Integral Calculus and Differential Equations	03	03	03	40	60	100
	M – 23	Practical course – II	04	02	03	40	60	100

<b>Core Course</b>		<b>Statistics</b>							
	S-21	Descriptive Statistics-II	03	03	03	40	60	100	
	S-22	Discrete Probability and Probability Distributions-II	03	03	03	40	60	100	
	S- 23	Practical course – II	04	02	03	40	60	100	
<b>Core Course</b>		<b>Geography</b>							
	G -21	Physical Geography – II	03	03	03	40	60	100	
	G - 22	Oceanography	03	03	03	40	60	100	
	G- 23	Practical course – II	04	02	03	40	60	100	
<b>Core Course</b>		<b>Computer Application</b>							
	CA-21	Operating Environment	03	03	03	40	60	100	
	CA-22	Programming in C -II	03	03	03	40	60	100	
	CA- 23	Practical course – II	04	02	03	40	60	100	
<b>AECC*</b>	<b>This course is compulsory for all the students.</b>								
	UG-AECC-21	Renovable Energy And Energy Harvesting	02	02	02	20	30	50	

**AECC \*: Ability enhancement compulsory course**

## **S. Y. B. Sc. (Sem. III and IV)**

### **CORE SELECTIVE GROUPS (SELECT ANY ONE GROUP FROM THE FOLLOWING)**

Group I :- Physics, Chemistry and Mathematics (PCM)

Group II :- Physics, Mathematics and Statistics (PMS)

Group III :- Physics, Mathematics and Computer Application (PMCA).

Group IV :- Mathematics, Statistics and Computer Application (MSCA)

Group V :- Chemistry, Botany and Zoology (CBZ)

Group VI :- Chemistry, Botany and Microbiology (CBM)

Group VII :- Chemistry, Zoology and Microbiology (CZM)

Group VIII :- Botany, Zoology and Microbiology (BZM)

Group IX :- Zoology, Microbiology and Geography (ZMG)

### **ENVIRONMENT STUDIES**

**As per the order of Honorable 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 02 lectures per week 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 Grade Sheet. It is mandatory for every students to pass this course. If any student fails in this course, the result of his/her degree course will be withheld by the university.**

### 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 IA	University Examination UE	Total
<b>Core Course</b>		<b>Physics</b>						
	P - 31	Mathematical Methods for Physics	04	04	03	40	60	100
	P – 32	Optics	04	04	03	40	60	100
	P - 33	Practical course - III	04	02	03	40	60	100
<b>Core Course</b>		<b>Chemistry</b>						
	C-31	Physical and Analytical Chemistry – I	04	04	03	40	60	100
	C-32	Organic and Inorganic Chemistry - III	04	04	03	40	60	100
	C - 33	Practical Course-III	04	02	03	40	60	100
<b>Core Course</b>		<b>Botany</b>						
	B –31	Plant anatomy and Embryology	04	04	03	40	60	100
	B –32	Angiosperm Taxonomy	04	04	03	40	60	100
	B -33	Practical course - III	04	02	03	40	60	100
<b>Core Course</b>		<b>Zoology</b>						
	Z-31	Functional Anatomy of Non-chordates-II and Biodiversity	04	04	03	40	60	100
	Z-32	Histology of Mammals	04	04	03	40	60	100
	Z-23	Practical course - III	04	02	03	40	60	100
<b>Core Course</b>		<b>Microbiology</b>						
	MB-31	Microbial Metabolism	04	04	03	40	60	100
	MB -32	Bacterial Genetics	04	04	03	40	60	100
	MB- 33	Practical course - III	04	02	06	40	60	100
<b>Core Course</b>		<b>Mathematics</b>						
	M-31	Calculus of Several Variables	04	04	03	40	60	100
	M-32	Group Theory and Differential Equations	04	04	03	40	60	100
	M – 33	Practical course - III	04	02	03	40	60	100
<b>Core Course</b>		<b>Statistics</b>						
	S-31	Probability Distributions And Statistical Inference-I	04	04	03	40	60	100



Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment IA	University Examination UE	Total
	S-32	Probability Distribution And Statistical Methods- I	04	04	03	40	60	100
	S- 33	Practical course - III	04	02	03	40	60	100
<b>Core Course</b>		<b>Geography</b>						
	G - 31	Human Geography-I	04	04	03	40	60	100
	G – 32	Biogeography - I	04	04	03	40	60	100
	G- 33	Practical course - III	04	02	03	40	60	100
<b>Core Course</b>		<b>Computer Application</b>						
	CA -31	Advanced C Concepts -I	04	04	03	40	60	100
	CA -32	Digital Electronics I	04	04	03	40	60	100
	CA- 33	Practical course - III	04	02	03	40	60	100
<b>Elective Course</b>	<b>Any one of the following.</b>							
	ENG-31	English –I	04	04	03	40	60	100
	MAR-32	Marathi – I	04	04	03	40	60	100
<b>SEC*</b>	<b>This course is compulsory for all the students.</b>							
	UG- SEC-31	Medical Dignostics	02	02	02	20	30	50

**\*SEC: Skill Enhancement Course**

## Semester IV (From the Academic Year 2019-20)

Subject Type	Code	Title of the paper	Hrs/Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment IA	University Examination UE	Total
<b>Core Course</b>		<b>Physics</b>						
	P - 41	Waves & Oscillations	04	04	03	40	60	100
	P - 42	Electronics	04	04	03	40	60	100
	P - 43	Practical course – IV	04	02	03	40	60	100
<b>Core Course</b>		<b>Chemistry</b>						
	C-41	Physical and Analytical Chemistry – II	04	04	03	40	60	100
	C-42	Organic and Inorganic Chemistry - IV	04	04	03	40	60	100
	C - 43	Practical Course-IV	04	02	03	40	60	100
<b>Core Course</b>		<b>Botany</b>						
	B –41	Plant Biotechnology	04	04	03	40	60	100
	B –42	Plant Physiology	04	04	03	40	60	100
	B -43	Practical course - IV	04	02	03	40	60	100
<b>Core Course</b>		<b>Zoology</b>						
	Z –41	Functional Anatomy of chordates-II	04	04	03	40	60	100
	Z - 42	Physiology of Mammals	04	04	03	40	60	100
	Z- 43	Practical course - IV	04	02	03	40	60	100
<b>Core Course</b>		<b>Microbiology</b>						
	MB 41	Principles of Disease, Epidemiology and Immunology	04	04	03	40	60	100
	MB 42	Applied Microbiology	04	04	03	40	60	100
	MB- 43	Practical course - IV	04	02	06	40	60	100
<b>Core Course</b>		<b>Mathematics</b>						
	M-41	Vector Calculus	04	04	03	40	60	100
	M-42	Complex variables	04	04	03	40	60	100
	M – 43	Practical course - IV	04	02	03	40	60	100
<b>Core Course</b>		<b>Statistics</b>						
	S-41	Probability Distributions And Statistical Inference-II	04	04	03	40	60	100
	S-42	Probability Distribution And Statistical Methods-II	04	04	03	40	60	100
	S- 43	Practical course - IV	04	02	03	40	60	100

<b>Core Course</b>		<b>Geography</b>						
	G - 41	Human Geography-II	04	04	03	40	60	100
	G - 42	Biogeography - II	04	04	03	40	60	100
	G- 43	Practical course - IV	04	02	03	40	60	100
<b>Core Course</b>		<b>Computer Application</b>						
	CA -41	Advanced C Concepts –II	04	04	03	40	60	100
	CA -42	Digital Electronics II	04	04	03	40	60	100
	CA- 43	Practical course – IV	04	02	03	40	60	100
<b>Elective Course</b>		<b>Any one of the following.</b>						
	ENG-41	English –II	04	04	03	40	60	100
	MAR-42	Marathi - II	04	04	03	40	60	100

## T. Y. B. Sc. (Sem. V and VI)

The student should select any one subject from the core group which he / she has opted at S.Y.B.Sc. (Semester III and IV) as Principle subject.

### Semester V (From the Academic Year 2020-21)

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment IA	University Examination UE	Total
<b>Core Course</b>		<b>Physics</b>						
	P-51	Mathematical Methods in Physics	04	04	03	40	60	100
	P-52	Quantum Mechanics	04	04	03	40	60	100
	P-53	Solid State Physics	04	04	03	40	60	100
	P-54	Advanced Electronics	04	04	03	40	60	100
	P-55	Classical Mechanics	04	04	03	40	60	100
	P-56	Practical Course – V	04	02	03	40	60	100
	P-57	Practical Course – VI	04	02	03	40	60	100
	P-58	Practical Course - VII	04	02	03	40	60	100
<b>Elective Course</b>		<b>Any one of the following.</b>						
	P-59A	Elements of Materials Science	04	04	03	40	60	100
	P-59B	Medical Electronics	04	04	03	40	60	100
	P-59C	Digital Electronics I	04	04	03	40	60	100
<b>Core Course</b>		<b>Chemistry</b>						
	C-51	Physical Chemistry –I	04	04	03	40	60	100
	C-52	Inorganic Chemistry – I	04	04	03	40	60	100
	C-53	Organic Chemistry – I	04	04	03	40	60	100
	C-54	Analytical Chemistry – I	04	04	03	40	60	100
	C-55	Industrial Chemistry - I	04	04	03	40	60	100
	C-56	Practical Course – V	04	02	03	40	60	100
	C-57	Practical Course – VI	04	02	03	40	60	100
	C-58	Practical Course - VII	04	02	03	40	60	100
<b>Elective Course</b>		<b>Any one of the following.</b>						
	C – 59A	Environment Chemistry-I	04	04	03	40	60	100
	C – 59B	Nuclear Chemistry-I	04	04	03	40	60	100
	C – 59C	Polymer Chemistry-I	04	04	03	40	60	100
<b>Core Course</b>		<b>Botany</b>						
	B –51	Biology of lower cryptogams(Algae & Fungi)	04	04	03	40	60	100
	B –52	Biology of seed plants (Angiosperms)	04	04	03	40	60	100
	B –53	Plant pathology and Plant protection	04	04	03	40	60	100
	B –54	Genetics and Biostatistics	04	04	03	40	60	100
	B –55	Molecular biology and Biochemistry	04	04	03	40	60	100

Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment IA	University Examination UE	Total
	B-56	Practical Course – V	04	02	03	40	60	100
	B -57	Practical Course – VI	04	02	03	40	60	100
	B - 58	Practical Course - VII	04	02	03	40	60	100
<b>Elective Course</b>	<b>Any one of the following.</b>							
	B- 59A	Aerobiology	04	04	03	40	60	100
	B – 59B	Medico Botany	04	04	03	40	60	100
	B – 59C	Conservation of Medicinal Plants	04	04	03	40	60	100
<b>Core Course</b>	<b>Zoology</b>							
	Z – 51	Developmental Biology	04	04	03	40	60	100
	Z – 52	Genetics and evolution	04	04	03	40	60	100
	Z – 53	Applied Zoology- Apiculture and Inland fisheries	04	04	03	40	60	100
	Z – 54	Parasitology	04	04	03	40	60	100
	Z – 55	Ecology and environmental pollution	04	04	03	40	60	100
	Z-56	Practical Course – V	04	02	03	40	60	100
	Z -57	Practical Course – VI	04	02	03	40	60	100
	Z - 58	Practical Course - VII	04	02	03	40	60	100
<b>Elective Course</b>	<b>Any one of the following.</b>							
	Z- 59A	Biochemistry and Molecular Biology	04	04	03	40	60	100
	Z – 59B	Comparative anatomy of Chordates and Micro-techniques	04	04	03	40	60	100
	Z – 59C	Evolution	04	04	03	40	60	100
<b>Core Course</b>	<b>Microbiology</b>							
	MB- 51	Medical Microbiology	04	04	03	40	60	100
	MB -52	Clinical Pathology	04	04	03	40	60	100
	MB- 53	Virology	04	04	03	40	60	100
	MB- 54	Genetics of Prokaryotes	04	04	03	40	60	100
	MB- 55	Enzyme Kinetics and Regulation	04	04	03	40	60	100
	MB -56	Practical Course – V	04	02	03	40	60	100
	MB -57	Practical Course – VI	04	02	03	40	60	100
MB - 58	Practical Course - VII	04	02	03	40	60	100	
<b>Elective Course</b>	<b>Any one of the following.</b>							
	MB-59A	Food and diary Microbiology	04	04	03	40	60	100
	MB-59B	Applied Microbiology-I	04	04	03	40	60	100
	MB-59C	Advance Techniques in Microbiology-I	04	04	03	40	60	100

<b>Core Course</b>		<b>Mathematics</b>						
	M-51	Real Analysis- I	04	04	03	40	60	100
	M-52	Abstract Algebra – I	04	04	03	40	60	100
	M-53	Discrete Mathematics –I	04	04	03	40	60	100
	M-54	Differential Geometry-I	04	04	03	40	60	100
	M-55	Computer Programming and Applications –I	04	04	03	40	60	100
	M-56	Practical Course – V	04	02	03	40	60	100
	M-57	Practical Course – VI	04	02	03	40	60	100
M-58	Practical Course - VII	04	02	03	40	60	100	
<b>Elective Course</b>	<b>Any one of the following.</b>							
	M-59A	Mechanics(statics)	04	04	03	40	60	100
	M-59B	Operation Research-I	04	04	03	40	60	100
	M-59C	Special Functions-I	04	04	03	40	60	100
<b>Core Course</b>		<b>Statistics</b>						
	S-51	Distribution Theory - I	04	04	03	40	60	100
	S-52	Statistical Inference - I	04	04	03	40	60	100
	S-53	Sampling Methods and Design of Experiments-I	04	04	03	40	60	100
	S-54	Applied Statistics(A)-I	04	04	03	40	60	100
	S-55	Applied Statistics(B)-I	04	04	03	40	60	100
	S-56	Practical Course – V	04	02	03	40	60	100
	S-57	Practical Course – VI	04	02	03	40	60	100
S-58	Practical Course - VII	04	02	03	40	60	100	
<b>Elective Course</b>	<b>Any one of the following.</b>							
	S-59A	Computer Programming. ‘C’ Programming (Turbo C)-I	04	04	03	40	60	100
	S-59B	Principles of Computer Science-I	04	04	03	40	60	100
	S-59C	Statistical Ecology	04	04	03	40	60	100
<b>Core Course</b>		<b>Geography</b>						
	G-51	World Regional Geography-I	04	04	03	40	60	100
	G-52	Geography of India-I	04	04	03	40	60	100
	G-53	Resources and environment-I	04	04	03	40	60	100
	G-54	Economic Geography-I	04	04	03	40	60	100
	G-55	Applied Geography-I	04	04	03	40	60	100
	G-56	Practical Course – V	04	02	03	40	60	100
	G-57	Practical Course – VI	04	02	03	40	60	100
G-58	Practical Course - VII	04	02	03	40	60	100	
<b>Elective Course</b>	<b>Any one of the following.</b>							
	G-59A	Geography of Water Resources-I	04	04	03	40	60	100
	G-59B	Geography of Soils-I	04	04	03	40	60	100
	G-59C	Population Geography-I	04	04	03	40	60	100

<b>Core Course</b>		<b>Computer Application</b>						
	CA -51	Operating System-I	04	04	03	40	60	100
	CA -52	Visual basic. Net programming-I	04	04	03	40	60	100
	CA -53	Software Engineering -I	04	04	03	40	60	100
	CA -54	Database Management System-I	04	04	03	40	60	100
	CA -55	Data and File structure-I	04	04	03	40	60	100
	CA- 56	Practical Course – V	04	02	03	40	60	100
	CA-57	Practical Course – VI	04	02	03	40	60	100
CA- 58	Practical Course - VII	04	02	03	40	60	100	
<b>Elective Course</b>	<b>Any one of the following.</b>							
	CA-59A	Computer Networks-I	04	04	03	40	60	100
	CA-59B	Internet Programming-I	04	04	03	40	60	100
	CA-59C	Theoretical computer science-I	04	04	03	40	60	100
<b>SEC*</b>	<b>This course is compulsory for all the students.</b>							
	UG - SEC-51	Soft skills	02	02	02	20	30	50

**SEC\*- Skill Enhancement Course**

## Semester VI (From the Academic Year 2020-21)

Subject Type	Code	Title of the paper	Hrs/Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment CIA	University Examination UEX	Total
<b>Core Course</b>		<b>Physics</b>						
	P-61	Classical Electrodynamics	04	04	03	40	60	100
	P-62	Atomic and Molecular Physics	04	04	03	40	60	100
	P-63	Nuclear Physics	04	04	03	40	60	100
	P-64	Computational Physics	04	04	03	40	60	100
	P-65	Thermodynamics & Statistical Physics	04	04	03	40	60	100
	P-66	Practical Course – VIII	04	02	03	40	60	100
	P-67	Practical Course – IX	04	02	03	40	60	100
	P-68	Practical Course - X	04	02	03	40	60	100
<b>Elective Course</b>		<b>Any one of the following.</b>						
	P-69A	Renewable Energy sources	04	04	03	40	60	100
	P-69B	Physics of Nano Materials	04	04	03	40	60	100
	P-69C	Digital Electronics II	04	04	03	40	60	100
<b>Core Course</b>		<b>Chemistry</b>						
	C-61	Physical Chemistry-II	04	04	03	40	60	100
	C-62	Inorganic Chemistry-II	04	04	03	40	60	100
	C-63	Organic Chemistry-II	04	04	03	40	60	100
	C-64	Analytical Chemistry-II	04	04	03	40	60	100
	C-65	Industrial Chemistry-II	04	04	03	40	60	100
	C-66	Practical Course – VIII	04	02	03	40	60	100
	C-67	Practical Course – IX	04	02	03	40	60	100
	C-68	Practical Course - X	04	02	03	40	60	100
<b>Elective Course</b>		<b>Any one of the following.</b>						
	C – 69A	Environment Chemistry-II	04	04	03	40	60	100
	C – 69B	Nuclear Chemistry-II	04	04	03	40	60	100
	C – 69C	Polymer Chemistry-II	04	04	03	40	60	100
<b>Core Course</b>		<b>Botany</b>						
	B –61	Biology of higher cryptogams (Bryophytes & Pteridophytes )	04	04	03	40	60	100
	B –62	Biology of seed plants (Gymnosperms & Paleobotany)	04	04	03	40	60	100



Subject Type	Code	Title of the paper	Hrs/ Week	Credits	Exam Hrs	Maximum Marks		
						Continuous Internal Assessment CIA	University Examination UEX	Total
	B –63	Environmental Botany	04	04	03	40	60	100
	B –64	Palynology & Plant breeding	04	04	03	40	60	100
	B –65	Industrial botany II	04	04	03	40	60	100
	B-66	Practical Course – VIII	04	02	03	40	60	100
	B -67	Practical Course – IX	04	02	03	40	60	100
	B - 68	Practical Course - X	04	02	03	40	60	100
<b>Elective Course</b>	<b>Any one of the following.</b>							
	B- 69A	Horticulture & Gardening	04	04	03	40	60	100
	B – 69B	Pharmacognosy	04	04	03	40	60	100
	B – 69C	Seed Technology	04	04	03	40	60	100
<b>Core Course</b>	<b>Zoology</b>							
	Z – 61	General Embryology	04	04	03	40	60	100
	Z – 62	Toxicology	04	04	03	40	60	100
	Z – 63	Biological Techniques	04	04	03	40	60	100
	Z – 64	Functional Anatomy of Chordates-III	04	04	03	40	60	100
	Z – 65	Economic Entomology	04	04	03	40	60	100
	Z-66	Practical Course – VIII	04	02	03	40	60	100
	Z -67	Practical Course – IX	04	02	03	40	60	100
	Z - 68	Practical Course - X	04	02	03	40	60	100
<b>Elective Course</b>	<b>Any one of the following.</b>							
	Z- 69A	Biotechnology	04	04	03	40	60	100
	Z – 69B	Biostatistics	04	04	03	40	60	100
	Z – 69C	Biodiversity and wild Life	04	04	03	40	60	100
<b>Core Course</b>	<b>Microbiology</b>							
	MB 61	Chemotherapy and Biomedical Instrumentation.	04	04	03	40	60	100
	MB 62	Immunology	04	04	03	40	60	100
	MB 63	Biotechnology	04	04	03	40	60	100
	MB 64	Genetics of Eukaryotes and Gene Manipulation	04	04	03	40	60	100
	MB 65	Microbial Metabolism and Biochemical Evolution	04	04	03	40	60	100
	MB -66	Practical Course – VIII	04	02	03	40	60	100
	MB -67	Practical Course – IX	04	02	03	40	60	100
	MB - 68	Practical Course - X	04	02	03	40	60	100

<b>Elective Course</b>	<b>Any one of the following.</b>							
	MB-69A	Agricultural and Environmental Microbiology.	04	04	03	40	60	100
	MB-69B	Applied Microbiology-II	04	04	03	40	60	100
	MB-69C	Advanced Techniques in Microbiology-II	04	04	03	40	60	100
<b>Core Course</b>	<b>Mathematics</b>							
	M-61	Real Analysis- II	04	04	03	40	60	100
	M-62	Abstract Algebra – II	04	04	03	40	60	100
	M-63	Discrete Mathematics – II	04	04	03	40	60	100
	M-64	Differential Geometry-II	04	04	03	40	60	100
	M-65	Computer Programming and Applications –II	04	04	03	40	60	100
	M-66	Practical Course – VIII	04	02	03	40	60	100
	M-67	Practical Course – IX	04	02	03	40	60	100
	M-68	Practical Course - X	04	02	03	40	60	100
<b>Elective Course</b>	<b>Any one of the following.</b>							
	M-69A	Operation Research-II	04	04	03	40	60	100
	M-69B	Mechanics(Dynamics)	04	04	03	40	60	100
	M-69C	Special Functions-II	04	04	03	40	60	100
<b>Core Course</b>	<b>Statistics</b>							
	S-61	Distribution Theory - II	04	04	03	40	60	100
	S-62	Statistical Inference - II	04	04	03	40	60	100
	S-63	Sampling Methods and Design of Experiments-II	04	04	03	40	60	100
	S-64	Applied Statistics(A)-II	04	04	03	40	60	100
	S-65	Applied Statistics(B)-II	04	04	03	40	60	100
	S-66	Practical Course – VIII	04	02	03	40	60	100
	S-67	Practical Course – IX	04	02	03	40	60	100
	S-68	Practical Course - X	04	02	03	40	60	100
<b>Elective Course</b>	<b>Any one of the following.</b>							
	S-69A	Computer Programming. 'C' Programming (Turbo C)-II	04	04	03	40	60	100
	S-69B	Principles of Computer Science-II	04	04	03	40	60	100
	S-69C	Medical Statistics	04	04	03	40	60	100

<b>Core Course</b>		<b>Geography</b>						
	G-61	World Regional Geography-II	04	04	03	40	60	100
	G-62	Geography of India-II	04	04	03	40	60	100
	G-63	Recourses and Environment-II	04	04	03	40	60	100
	G-64	Economic Geography-II	04	04	03	40	60	100
	G-65	Applied Geography-II	04	04	03	40	60	100
	G-66	Practical Course – VIII	04	02	03	40	60	100
	G-67	Practical Course – IX	04	02	03	40	60	100
G-68	Practical Course - X	04	02	03	40	60	100	
<b>Elective Course</b>	<b>Any one of the following.</b>							
	G-69A	Geography of Water Resources-II	04	04	03	40	60	100
	G-69B	Geography of Soils-II	04	04	03	40	60	100
	G-69C	Population Geography-II	04	04	03	40	60	100
<b>Core Course</b>		<b>Computer Application</b>						
	CA-61	Operating System-II	03	03	03	40	60	100
	CA-62	Visual basic. Net programming-II	03	03	03	40	60	100
	CA-63	Software Engineering-II	03	03	03	40	60	100
	CA-64	Database Management System-II	03	03	03	40	60	100
	CA-65	Data and File structure-II	03	03	03	40	60	100
	CA-66	Practical Course-VIII	04	02	03	40	60	100
	CA-67	Practical Course-IX	04	02	03	40	60	100
CA-68	Practical Course-X	04	02	03	40	60	100	
<b>Elective Course</b>	<b>Any one of the following.</b>							
	CA-69A	Computer Networks-II	04	04	03	40	60	100
	CA-69B	Internet Programming-II	04	04	03	40	60	100
	CA-69C	Theoretical computer science-II	04	04	03	40	60	100

**SCHEME OF TEACHING:**

Class	Subjects	Work Load / Week			
		Theory	Tutorial	Total	Practical
F.Y.B.Sc.	<b>13</b>	2	1	03	04
S.Y.B.Sc.	<b>11</b>	3	1	04	04
T.Y.B.Sc	<b>10</b>	3	1	04	04

**MEDIUM OF INSTRUCTION:**

The medium of instruction and examination shall be English.

**UNIVERSITY TERMS:**

The dates for the commencement and conclusion of the First and the Second terms shall be fixed by the University authorities. The terms can be kept by students, who have registered their names with the University.

**SCHEME OF EXAMINATION:**

The Assessment of Regular students of Bachelor of Science (B.Sc.) course in the academic session 2016-17 and thereafter shall be based on

- (a) University Examinations (UE),
- (b) Continuous 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 Continuous 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 Continuous Internal Assessment (IA) for each paper will be of 40 marks. The Continuous 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

**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, a student 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.

Even a student fails in IA, he/she shall be declared 'pass' 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 student 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
$80 \leq \text{Marks} \leq 100$	O	10
$70 \leq \text{Marks} < 80$	A+	9
$60 \leq \text{Marks} < 70$	A	8
$55 \leq \text{Marks} < 60$	B+	7
$50 \leq \text{Marks} < 55$	B	6
$40 \leq \text{Marks} < 50$	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 weighteg for performance at UE and IA shall be 60% and 40% respectively.

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  $x = \text{Max} / 10$  (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
$8x \leq \text{Marks} \leq 10x$	10
$5.5x \leq \text{Marks} < 8x$	Truncate (Marks/x) +2
$4x \leq \text{Marks} < 5.5x$	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 student in all the courses in a particular semester, while the CGPA measures the cumulative performance in all courses since his/her enrolment to the course. The CGPA of learner when he/she completes the programme is the final result of the learner.

The SGPA is calculated by the formula  $SGPA = \frac{\sum C_k \times GP_k}{\sum C_k}$ , where  $C_k$  is the credit-value assigned to a course and  $GP_k$  is the GPA obtained by the student in the course. In the above, the sum is taken over all the courses that the student 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  $CGPA = \frac{\sum C_k \times GP_k}{\sum C_k}$ , where  $C_k$  is the credit-value assigned to a course and  $GP_k$  is the GPA obtained by the student in the course. In the above, the sum is taken over all the courses that the student has undertaken

for the study from the time of his/her enrolment to the course and also 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 decimals place accuracy.

**The Formula to compute equivalent percentage marks for specified CGPA:**

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

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

A candidate shall be permitted to precede further from the First Semester up to 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 backlog subjects of earlier semesters along with current (subsequent) semester subjects. However, he/she should have cleared all the papers at F.Y.B.Sc. Semester I & II when he/she is admitted to T.Y.B.Sc. Semester V.

**GRACING:**

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

**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 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.

**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								
6								
Total Cumulative Credits Completed			SGPA		CGPA		Equivalent Marks (%)	
<b>Note:</b> 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.								

## Course structure of B.Sc. Degree Programme and scheme of credits

### Course Structure and Scheme of Credits :

Course	Semester	Credits	Total of Semester	Grant Total year
F. Y. B. Sc.	I	Theory (Core)- 24	32	66
		Practical-08		
	II	Theory (Core)- 24	34	
		Practical-08		
		AECC-02		
S. Y. B.Sc.	III	Theory (Core)- 24	36	70
		Practical -06		
		Elective-04		
		SEC-02		
	IV	Theory (Core)- 24	34	
		Practical -06		
		Elective-04		
T. Y. B.Sc.	V	Theory (Core)- 20	32	62
		Practical -06		
		Elective-04		
		SEC-02		
	VI	Theory (Core)- 20	30	
		Practical -06		
		Elective-04		
<b>Grant Total of the Course (All Semesters)</b>			<b>198</b>	<b>198</b>

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