



**SAPTHAGIRI COLLEGE OF ENGINEERING, BANGALORE - 57**  
(Affiliated to VTU, Belagavi, and Recognized by AICTE, New Delhi)

14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-56005  
(Accredited by NAAC with "A" grade) Accredited by NBA (CSE, ECE, EEE, ISE, ME)  
(An ISO 9001:2015 & ISO 14001:2015 Certified)

**DEPARTMENT OF BIOTECHNOLOGY**

**1.3.2 Number of courses that include experiential learning through project work/field work/internship during the year 2023 -24**

Sl.No.	Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code	Details of Experiential Learning through Projects/ Internship
<b>FINAL YEAR</b>					
1.	BIOTECHNOLOGY	BT	Bioprocess Engineering	18BT71	Extraction of natural dyes from flowers
2.	BIOTECHNOLOGY	BT	Clinical & Pharmaceutical BT	18BT72	Cloning and expression of immunogenic epitope of human papilloma virus
3.	BIOTECHNOLOGY	BT	Bioreactor Design Concepts	18BT732	Phytochemical screening and anti-inflammatory properties of Garcinia mangostana.
4.	BIOTECHNOLOGY	BT	Agricultural Biotechnology	18BT742	Extraction of essential oils from flowers, fruits and herbs: process optimization, study of products and plant designing.
5.	BIOTECHNOLOGY	BT	Bioprocess Engineering Laboratory	18BTL76	Isolation and extraction of thymoquinone and evaluating its pharmacokinetics approach.
6.	BIOTECHNOLOGY	BT	Project Work Phase – 1	18BTL77	Biosynthesis of carbon nanoparticles using Juglans regia (Walnut) shells and its application in bioremediation for the removal of heavy metal nickel from waste water and analysis its anti-microbial properties.
7.	BIOTECHNOLOGY	BT	Internship	18BTP71	Biological synthesis of zinc based nanoparticles synthesis using secondary metabolites from Bacillus thuringiensis and their larvicidal activity against mosquito
8.	BIOTECHNOLOGY	BT	Environmental Biotechnology	18BT821	Phytochemical screening of Ruta graveolens plant and its antimicrobial, anticancer activity (MCF-7) for breast cancer

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Head of the Department  
Dept. of Bio-Technology  
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**DEPARTMENT OF BIOTECHNOLOGY**

9.	BIOTECHNOLOGY	BT	Industrial Microbiology	18BT822	Synthesis, characterization and applications of cellulose from discarded cigarette butts.
10.	BIOTECHNOLOGY	BT	Project Work Phase - 2	18BTP83	Development and Characterization of bio-polymeric membranes by using polysaccharides
11.	BIOTECHNOLOGY	BT	Technical Seminar	18BTS84	Isolation of <i>S. enfoiatus</i> from Mangrove stem and enhancement of leupeptin production through fermentation techniques
12.	BIOTECHNOLOGY	BT	Internship	18BTI85	Optimization of physical parameters for enhancement of Erythromycin production with feeding available cheap nitrogen sources and carbon sources in <i>Saccharo polysporaerythraea</i>
13.	BIOTECHNOLOGY	BT			Green synthesis of zinc oxide nano particles using <i>Murraya koenigii</i> and the study their anti microbial anti oxidant and anti-cancerous activity
14.	BIOTECHNOLOGY	BT			Synthesis, characterization of copper nanoparticles extracted from catnip leaves and its application as mosquito repellent
15.	BIOTECHNOLOGY	BT			Green synthesis of selenium nano particles from <i>eclipta prostrata</i> extract and its anti cancer on lung cancer
<b>THIRD YEAR</b>					
16.	BIOTECHNOLOGY	BT	Biokinetics & Bioreaction engineering	PCC21BT51	Synthesis and characterization of Carbon nano particle using <i>Calotropis procera</i> extract
17.	BIOTECHNOLOGY	BT	Immunotechnology+lab	IPCC21BT52	Carotenoid extract from Pumpkin
18.	BIOTECHNOLOGY	BT	Structural biology & Analytical techniques	PCC21BT53	Phytochemical extraction from beetroot peel
19.	BIOTECHNOLOGY	BT	Genomics, Proteomics & Bioinformatics	PCC21BT54	Isolation and Characterization of bacteria from mangrove sediment at coastal area in Karanataka

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### DEPARTMENT OF BIOTECHNOLOGY

20.	BIOTECHNOLOGY	BT	Bioinformatics lab	PCC21BTL55	Property study of Banana pseudostem
21.	BIOTECHNOLOGY	BT	Research methodology & Intellectual property rights	AEC21BT56	Green synthesis of Selenium oxide nanoparticle from sage leaf extract and study
22.	BIOTECHNOLOGY	BT	Bioprocess Principles, Control & Automation + Lab	IPCC21BT62	Isolation of Gut micro biota from Silkworm
23.	BIOTECHNOLOGY	BT	Enzyme Technology	PCC21BT63	Microbial activity of fungi as a Biopesticide
24.	BIOTECHNOLOGY	BT	Enzyme Technology lab	PCC21BTL66	Isolation, Purification Production and Biochemical characterization of Bacterial Gamma CGTase
25.					
	BIOTECHNOLOGY	BT	Mini project	MP21BTMP67	
<b>SECOND YEAR</b>					
26.	BIOTECHNOLOGY	BT	Unit Operations + Lab	BBT302	Study of antimicrobial properties of edible and non edible mushrooms
27.	BIOTECHNOLOGY	BT	Biochemistry +Lab	BBT303	Bioplastic
28.	BIOTECHNOLOGY	BT	Microbiology	BBT304	Phytochemical and antimicrobial analysis of Constusigneus plant
29.	BIOTECHNOLOGY	BT	Microbiology Lab	BBTL305	Phytochemical screening and anti microbial screening using sweet flag
30.	BIOTECHNOLOGY	BT	Molecular Biology & Genetic Engineering	BBT401	Isolation and characterization of entophytic fungi from economically important crops
31.	BIOTECHNOLOGY	BT	Biostatistics and Tools + Lab	BBT402	Isolation and invitro screening of bacteriophage against drug resistance E.Coli
32.	BIOTECHNOLOGY	BT	Immunotechnology + Lab	BBT403	Isolation and characterization of Endophytic fungi from Passiflorae dulissp ( Passion fruit)

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**DEPARTMENT OF BIOTECHNOLOGY**

33.	BIOTECHNOLOGY	BT	Bioprocess Principles and Stoichiometry	BBT405C	Bio converted spirulina for nutraceutical chewing gummis
34.	BIOTECHNOLOGY	BT			Extraction of Catalase enzyme
35.	BIOTECHNOLOGY	BT			Extraction of Stevioside from stevia leaves
<b>FIRST YEAR</b>					
36.	BIOTECHNOLOGY	BT	Mathematics-I for CSE Stream	BMATS101	Bioreactors
37.	BIOTECHNOLOGY	BT	Applied Chemistry for CSE Stream	BCHE102	Bacterial Colony Characterization And Their Counting
38.	BIOTECHNOLOGY	BT	Introduction to Internet of Things	BETCK105H	Working Model Of Lungs
39.	BIOTECHNOLOGY	BT	Scientific Foundations of Health	BSFHK158	Phytoremediation
40.	BIOTECHNOLOGY	BT	Innovation and Design Thinking	BIDTK158	Hydroponics
41.	BIOTECHNOLOGY	BT			Integrated Farming System
42.	BIOTECHNOLOGY	BT			Working Model Of Kidney
43.	BIOTECHNOLOGY	BT			Physiology Of Muscle Contraction
44.	BIOTECHNOLOGY	BT			Plastoscope

  
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**HOD, BT**

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI													
B.E. in Biotechnology													
Scheme of Teaching and Examinations2022													
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)													
(Effective from the academic year 2023-24)													
III SEMESTER													
Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	PCC	BBT301	Cell Biology and Genetics	TD: BT PSB: BT	3	0	0		03	50	50	100	3
2	IPCC	BBT302	Unit Operations + Lab	TD: BT PSB: BT	3	0	2		03	50	50	100	4
3	IPCC	BBT303	Biochemistry +Lab	TD: BT PSB: BT	3	0	2		03	50	50	100	4
4	PCC	BBT304	Microbiology	TD: BT PSB: BT	3	0	0		03	50	50	100	3
5	PCCL	BBTL305	Microbiology Lab	TD: BT PSB: BT	0	0	2		03	50	50	100	1
6	ESC	BBT306x	Engineering Science Course	TD: BT PSB: BT	3	0	0		03	50	50	100	3
7	UHV	BSCK307	Social Connect and Responsibility	Any Department	0	0	2		01	100	---	100	1
8	AEC/ SEC	BBT358x	Ability Enhancement Course/Skill Enhancement Course - III	TD: BT PSB: BT	If the course is a Theory				01	50	50	100	1
					1	0	0						
					If a course is a laboratory				02				
9	MC	BNSK359	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100	0
		BPEK359	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		BYOK359	Yoga	Yoga Teacher									
Total										550	350	900	20
PCC: Professional Core Course, PCCL: Professional Core Course laboratory, UHV: Universal Human Value Course, MC: Mandatory Course (Non-credit), AEC: Ability Enhancement Course, SEC: Skill Enhancement Course, L: Lecture, T: Tutorial, P: Practical S= SDA: Skill Development Activity, CIE: Continuous Internal Evaluation, SEE: Semester End Evaluation.K:This letter in the course code indicates common to all the stream of engineering. ESC: Engineering Science Course, ETC: Emerging Technology													

  
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Course, PLC: Programming Language Course.

#### Engineering Science Course

BBT306A	Python Programming	BBT306C	R programming for Biologists
BBT306B	Human Anatomy and Physiology	BBT306D	Plant Physiology and Phyto-hormones

#### Ability Enhancement Course – III

BBT358A	Bio-Lab Management and Risk Assessment	BBT358C	Analysis Of Dairy Products Lab
BBT358B	Data presentation, Error Analysis and Inferences	BBT358D	Biodiversity and Conservation Law

**Professional Core Course (IPCC):** Refers to Professional Core Course Theory Integrated with practicals of the same course. Credit for IPCC can be 04 and its Teaching-Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23 may please be referred.

**National Service Scheme /Physical Education/Yoga:** All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.

01082024



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**B.E. in Biotechnology**  
**Scheme of Teaching and Examinations 2022**  
 Outcome Based Education (OBE) and Choice Based Credit System (CBCS)  
 (Effective from the academic year 2023-24)

## IV SEMESTER

SEMESTER													
Sl. No	Course and Course Code		Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Self Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
1	PCC	BBT401	Molecular Biology & Genetic Engineering	TD: BT PSB: BT	3	0	0		03	50	50	100	3
2	IPCC	BBT402	Biostatistics and Tools + Lab	TD: Maths/BT PSB: Maths/BT	3	0	2		03	50	50	100	4
3	IPCC	BBT403	Immunotechnology + Lab	TD: BT PSB: BT	3	0	2		03	50	50	100	4
4	PCCL	BBTL404	Molecular Biology & Genetic Engineering Lab	TD: BT PSB: BT	0	0	2		03	50	50	100	1
5	ESC	BBT405x	Engineering Science Course	TD: BT PSB: BT	3	0	0		03	50	50	100	3
6	AEC/ SEC	BBT456x	Ability Enhancement Course/Skill Enhancement Course- IV	TD and PSB: Concerned department	If the course is Theory				01	50	50	100	1
					1	0	0						
					If the course is a lab				02				
					0	0	2						
4	BSC	BBOK407	Biology For Engineers (Dr VM, SCE)	TD / PSB: BT, CHE,	3	0	0		03	50	50	100	3
7	UHV	BUHK408	Universal human values course	Any Department	1	0	0		01	50	50	100	1
9	MC	BNSK459	National Service Scheme (NSS)	NSS coordinator	0	0	2		100	---	100	0	
		BPEK459	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		BYOK459	Yoga	Yoga Teacher									
		Total						500					400

**PCC:** Professional Core Course, **PCCL:** Professional Core Course laboratory, **UHV:** Universal Human Value Course, **MC:** Mandatory Course (Non-credit), **AEC:** Ability

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Enhancement Course, **SEC**: Skill Enhancement Course, **L**: Lecture, **T**: Tutorial, **P**: Practical **S**= SDA: Skill Development Activity, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Evaluation. **K**: This letter in the course code indicates common to all the stream of engineering.

**Ability Enhancement Course / Skill Enhancement Course – IV**

BBT456A	Hydroponics, Aquaponics and Aeroponics	BBTL456C	Extraction methods and herbal products lab
BBTL456B	Water Analysis Lab	BBT456D	Biopesticides and Biofertilizers

**Engineering Science Course**

BBT405A	Biochemical Thermodynamics	BBT405C	Bioprocess Principles and Stoichiometry
BBT405B	Marine Bioresources and applications	BBT405D	Structural Biology and Biophysical Techniques

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**National Service Scheme /Physical Education/Yoga:** All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses is mandatory for the award of degree.

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**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**B.E. in BIOTECHNOLOGY**  
**Scheme of Teaching and Examinations 2021**  
**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2021 - 22)**

**V SEMESTER**

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
				Theory Lecture	Tutorial	Practical / Drawing	Self -Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	T	P	S					
1	PCC21BT51	Biokinetics & Bioreaction engineering	TD: BT PSB: BT	2	2	0	0	03	50	50	100	3
2	IPCC21BT52	Immunotechnology+lab	TD: BT PSB: BT	3	0	2	0	03	50	50	100	4
3	PCC21BT53	Structural biology & Analytical techniques	TD: BT PSB: BT	2	2	0	0	03	50	50	100	3
4	PCC21BT54	Genomics, Proteomics & Bioinformatics	TD: BT PSB: BT	3	0	0	0	03	50	50	100	3
5	PCC21BTL55	Bioinformatics lab	TD: BT PSB: BT	0	0	2	0	03	50	50	100	1
6	AEC21BT56	Research methodology & Intellectual property rights	TD: Any Department PSB: As identified by University	2	0	0	0	02	50	50	100	2
7	HSMC21CIV57	Environmental Studies	TD: Civil/ Environmental /Chemistry/ Biotech. PSB: Civil Engg	1	0	0	0	1	50	50	100	1
8	AEC21BT58X	Ability Enhancement Course-V	TD: BT PSB: BT	If offered as Theory courses				01	50	50	100	1
				1	0	0	1					
				If offered as lab. courses				02				
				0	0	2	0					
								<b>Total</b>	<b>400</b>	<b>400</b>	<b>800</b>	<b>18</b>

**Ability Enhancement Course - V**

21BT581	Bio-Innovation and Start-ups	21BT583	Modelling and Simulations in Biology
21BT582	Extraction Methods and Herbal products	21BT584	Good Manufacturing and Laboratory Practices

Note: BSC: Basic Science Course, PCC: Professional Core Course, IPCC: Integrated Professional Core Course, AEC –Ability Enhancement Course INT – Internship, HSMC: Humanity and Social Science & Management Courses.

L – Lecture, T – Tutorial, P- Practical/ Drawing, S – Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.

**Integrated Professional Core Course (IPCC):** refers to Professional Theory Core Course Integrated with Practical of the same course. Credit for IPCC can be 04 and its Teaching – Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). Theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by CIE only and there shall be no SEE. For more details the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech.) 2021-22 may be referred.

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**Scheme of Teaching and Examinations 2021**  
**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2021 - 22)**

**VI SEMESTER**

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	T	P	S					
1	HSMC21BT61	Biobusiness Management and Entrepreneurship	Any Department	3	0	0	1	03	50	50	100	3
2	IPCC21BT62	Bioprocess Principles, Control &Automation + Lab	TD: BT PSB: BT	3	0	2	0	03	50	50	100	4
3	PCC21BT63	Enzyme Technology	TD: BT PSB: BT	3	0	0	0	03	50	50	100	3
4	PEC21BT64x	Professional elective course-I	TD: BT PSB: BT	3	0	0	1	03	50	50	100	3
5	OEC21BT65x	Open elective course-I	TD: BT PSB: BT	3	0	0	1	03	50	50	100	3
6	PCC21BTL66	Enzyme Technology lab	TD: BT PSB: BT	0	0	2	0	03	50	50	100	1
7	MP21BTMP67	Mini project	BT	Two contact hours /week for interaction between the faculty and students.				--	100	--	100	2
8	INT21INT68	Innovation/Entrepreneurship /Societal Internship	Completed during the intervening period of IV and V semesters.					--	100	--	100	3
Total								500	300	800	22	

**Professional Elective Course - I**

21BT641	Human Anatomy and Physiology	21BT643	Biological Data Management and Analysis
21BT642	Biochemical Thermodynamics and Bioenergetics	21BT644	Stem Cell Technology

**Open Elective course - I**

21BT651	Ecology and Ecosystem	21BT653	Forensic Science
21BT652	Food, Nutrition and Health	21BT654	Robotics in Healthcare and Agri Tech

**Note:** HSMC: Humanity and Social Science & Management Courses, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, PEC: Professional Elective Courses, OEC-Open Elective Course, MP-Mini Project, INT-Internship.

**L** -Lecture, **T** - Tutorial, **P** - Practical / Drawing, **S** - Self Study Component, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Examination.

**Integrated Professional Core Course (IPCC):** Refers to Professional Theory Core Course Integrated with Practical of the same course. Credit for IPCC can be 04 and its Teaching - Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by CIE only and there shall be no SEE. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech) 2021-22 may be referred.

**Professional Elective Courses(PEC):**

A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course out of five courses. The minimum students' strength for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the programme is less than 10.

**Open Elective Courses:**

Students belonging to a particular stream of Engineering and Technology are not entitled for the open electives offered by their parent Department. However, they can opt an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor.

Selection of an open elective shall **not be allowed** if,

- The candidate has studied the same course during the previous semesters of the program.
- The syllabus content of open electives is similar to that of the Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the program.

In case, any college is desirous of offering a course (not included in the Open Elective List of the University) from streams such as Law, Business (MBA), Medicine, Arts, Commerce, etc., can seek permission, at least one month before the commencement of the semester, from the University by submitting a copy of the syllabus along with the details of expertise available to teach the same in the college.



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**VII SEMESTER**

			Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
Sl. No	Course and Course Code				Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
1	PCC	18BT71	Bioprocess Engineering	Chemical/ Biotech	4	1	--	03	40	60	100	4
2	PCC	18BT72	Clinical & Pharmaceutical Biotechnology	Biotech	4	--	--	03	40	60	100	4
3	PEC	18BT73X	Professional Elective – 2	Chemical/ Biotech	3	--	--	03	40	60	100	3
4	PEC	18BT74X	Professional Elective – 3	Biotech	3	--	--	03	40	60	100	3
5	OEC	18BT75X	Open Elective –B	Biotech	3	--	--	03	40	60	100	3
6	PCC	18BTL76	Bioprocess Engineering Laboratory	Chemical/ Biotech	--	2	2	03	40	60	100	2
7	Project	18BTP77	Project Work Phase – 1	-	--	--	2	--	100	--	100	1
8	Internship	18BT71	Internship	(If not completed during the vacation of VI and VII semesters, it shall be carried out during the vacation of VII and VIII semesters )								
TOTAL					17	03	04	18	340	360	700	20

**Note: Note:** PCC: Professional core, PEC: Professional Elective.

**Project work:**

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.

**CIE procedure for Project Work Phase - 1:**

**(i) Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of the project work phase -1 Report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the Project report shall be the same for all the batch mates.

**(ii) Interdisciplinary:** Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of project work phase -1 Report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI			
Scheme of Teaching and Examination 2018 – 19			
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)			
(Effective from the academic year 2018 – 19)			
Programme: BIOTECHNOLOGY			
VI SEMESTER (continued)			
Internship: All the students admitted to III year of BE/B. Tech. shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-up/complete the internship shall be declared as failed and shall have to complete during subsequent University examination after satisfying the internship requirements			
Professional Elective – 2		Professional Electives - 3	
Course code under 18BT73X	Course Title	Course code under 18BT74X	Course Title
18BT731	Process Equipment & Plant Design	18BT741	Bioethics, Biosafety & IPR
18BT732	Bioreactor Design Concepts	18BT742	Agricultural Biotechnology
18BT733	Transport Phenomena	18BT743	Tissue Engineering
Open Elective –B			
Course code under 18BT75X	Course Title		
18BT751	BT for sustainable Environment		
18BT752	Forensic Science		
18BT753	Biological Data Management		
Students can select any one of the open electives offered by other Departments except those that are offered by the parent Department (Please refer to the list of open electives under 18BT75X).			
Selection of an open elective shall not be allowed if,			
<ul style="list-style-type: none"><li>• The candidate has studied the same course during the previous semesters of the programme.</li><li>• The syllabus content of open elective is similar to that of Departmental core course/s or professional electives.</li><li>• A similar course, under any category, is prescribed in the higher semesters of the programme.</li><li>• Registration to electives shall be documented under the guidance of Programme Coordinator/ Advisor/Mentor.</li></ul>			
AICTE activity Points: In case a student fails to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points.			

  
 Principal  
**Sapthagiri College of Engineering**  
 14/5, Chikkasandra, Hesaraghatta Main Road  
 Bengaluru - 560 057



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Scheme of Teaching and Examination 2018 – 19**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**Programme: BIOTECHNOLOGY**

**VIII SEMESTER**

VIII SEMESTER												
Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
1	PCC	18BT81	Regulatory Affairs in Biotech Industry	Biotech	3	--	--	03	40	60	100	3
2	PEC	18BT82X	Professional Elective - 4	Biotech	3	--	--	03	40	60	100	3
3	Project	18BTP83	Project Work Phase - 2	-	--	--	2	03	40	60	100	8
4	Seminar	18BTS84	Technical Seminar	-	--	--	2	03	100	--	100	1
5	Internship	18BTI85	Internship	Completed during the vacation/s of VI and VII semesters and/or VII and VIII semesters.				03	40	60	100	3
TOTAL					06	--	04	15	260	240	500	18

**Note:** PCC: Professional Core, PEC: Professional Elective.

**Professional Electives - 4**

Course code under 18BT82X	Course Title
18BT821	Environmental Biotechnology
18BT822	Industrial Microbiology
18BT823	Marine Biotechnology

**Project Work**

**CIE procedure for Project Work Phase - 2:**

(i) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -2, shall be based on the evaluation of project work phase -2 Report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

(ii) **Interdisciplinary:** Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work phase -2, shall be based on the evaluation of project work phase -2 Report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

**SEE for Project Work Phase - 2:**

(i) **Single discipline:** Contribution to the project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted at the department.

(ii) **Interdisciplinary:** Contribution to the project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belong to.

**Internship:** Those, who have not pursued /completed the internship, will be declared as failed and have to complete during subsequent University examination after satisfying the internship requirements.

**AICTE activity Points:** In case a student fails to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. The principals shall include the prescribed activity points earned by the students along with the CIE marks.

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