



Sri Srinivasa Educational & Charitab
SAPTHAGIRI COLLEGE OF ENGINEERING, BANGALORE - 57
 (Affiliated to VTU, Belagavi, and Recognized by AICTE, New Delhi)
 14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057
DEPARTMENT OF BIOTECHNOLOGY

1.3.2 Number of courses that include experiential learning through project work/field work/internship during the year 2022 -23

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
FINAL YEAR					
1.	BIOTECHNOLOGY	BT	Bioprocess Engineering	18BT71	Efficacy Of Biogenic Synthesized Silver Nanoparticles Using <i>Nasturtium Officinale</i> On Degradation Of Dye In Industrial Effluents
2.	BIOTECHNOLOGY	BT	Clinical & Pharmaceutical BT	18BT72	Antifungal activity of pomegranate extract against dermatophytes
3.	BIOTECHNOLOGY	BT	Bioreactor Design Concepts	18BT732	Biosynthesis Of Silver Nanoparticles Using <i>Citrullus lanatus</i> And Their Antibacterial And Antiproliferative Activity Against Lung Cancer Cells
4.	BIOTECHNOLOGY	BT	Agricultural Biotechnology	18BT742	Isolation and characterization of Bio surfactant producing bacteria
5.	BIOTECHNOLOGY	BT	Bioprocess Engineering Laboratory	18BTL76	Fabrication of ext Generation Energy Storage Devices - Cellulose Nano fibrils matrix
6.	BIOTECHNOLOGY	BT	Project Work Phase - 1	18BTL77	Green inhibitor Incorporated poly lactic acid for corrosion inhibition
7.	BIOTECHNOLOGY	BT	Internship	18BTP71	Computational drug discovery -Drug prediction using regression model
8.	BIOTECHNOLOGY	BT	Environmental Biotechnology	18BT821	Evaluation of Antihistamine Activity in the plant extract <i>Nasturtium officinale</i>
9.	BIOTECHNOLOGY	BT	Industrial Microbiology	18BT822	Studies on removal of dyes and efficiency of desalination -

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Head of the Department
 Dept. of Bio-Technology
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					isomorphous substituted nanoparticles
10.	BIOTECHNOLOGY	BT	Project Work Phase - 2	18BTP83	Screening of Bioactive Components from Endophytic fungi using plant source
11.	BIOTECHNOLOGY	BT	Technical Seminar	18BTS84	Green synthesis of Carbon nanodots by microwave assisted pyrolysis method
12.	BIOTECHNOLOGY	BT	Internship	18BTI85	
THIRD YEAR					
13.	BIOTECHNOLOGY	BT	Chemical Reaction Engineering	18BT52	Extraction of Natural dye from flower
14.	BIOTECHNOLOGY	BT	Enzyme Technology & Biotransformation	18BT53	Nicotine extraction, estimation and preparation of its gum
15.	BIOTECHNOLOGY	BT	Genomics & Proteomics	18BT54	Extraction of essential oil from frangipani flower
16.	BIOTECHNOLOGY	BT	Bioanalytical Techniques	18BT55	Development of ecofriendly biodegradable food packaging film from byproducts of fruit waste and processing with different plasticizers
17.	BIOTECHNOLOGY	BT	Genetic Engineering & Applications	18BT56	Isolation and Characterization of salinity tolerating bacteria
18.	BIOTECHNOLOGY	BT	Biokinetics & Enzyme Technology Laboratory	18BTL57	Extraction of natural hair dye from plant source
19.	BIOTECHNOLOGY	BT	Genetic Engineering and Cell Culture Laboratory	18BTL58	Synthesis of Polylactiacid from lactic acid
20.	BIOTECHNOLOGY	BT	Process Control & Automation Chemical	18BT61	Synthesis of biofilm from orange peel
21.	BIOTECHNOLOGY	BT	Bioinformatics	18BT63	Extraction and estimation of protease enzyme from kiwi fruit
22.	BIOTECHNOLOGY	BT	Bioinformatics Laboratory	18BTL67	Production of Furfural From Sugar cane bagasse

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23.	BIOTECHNOLOGY	BT	Mini-project	18BTMP68	Antibacterial activity of honey on <i>Staphylococcus aureus</i>
24.	BIOTECHNOLOGY	BT			Extraction of Pectin from citrus peels
25.					Phytofabrication of silver nanoparticle using the fruit extract of <i>Phyllanthus emblica</i>
26.					Extraction of mangiferin from mango leaves
SECOND YEAR					
27.	BIOTECHNOLOGY	BT	Unit Operations+Lab	IPCC21BT32	Comparative study of heavy metal bioremediation in soil by <i>Bacillus subtilis</i> and <i>Saccharomyces cerevisiae</i>
28.	BIOTECHNOLOGY	BT	Biochemistry+lab	IPCC21BT33	Antimicrobial activity of Tulsi, clove and Neem
29.	BIOTECHNOLOGY	BT	Microbiology	PCC21BT34	Production of Polyhydroxyalkonates
30.	BIOTECHNOLOGY	BT	Microbiology Laboratory	PCC21BTL35	Cationic and anionic Removal
31.	BIOTECHNOLOGY	BT	Cell biology & Cell culture Techniques + Lab	PCC21BT43	DNA finger printing
32.	BIOTECHNOLOGY	BT	Molecular Biology & Genetics Engg.	PCC21BT44	Fortified Rice
33.	BIOTECHNOLOGY	BT	Biology for Engineers	PCC21BE45	Detection of genetically modified plant source
34.	BIOTECHNOLOGY	BT	Molecular Biology and genetic engineering laboratory	PCC21BLT46	Skin cancer detection using convolutional neural networks
35.	BIOTECHNOLOGY	BT			Purification and biochemical characterization of alkalotolerant and thermophilic bacterial CGTase
36.					Production of Biodiesel from used cooking oil

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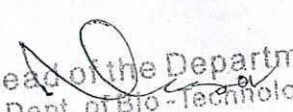
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37.					Oregano essential oil as a preservative for meat and meat product
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VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
B.E. in BIOTECHNOLOGY
Scheme of Teaching and Examinations 2021
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021 - 22)

III 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	BSC 21MAT31	Mathematics course (common to all)	TD- Maths PSB-Maths	2	2	0	0	03	50	50	100	3
2	IPCC 21BT32	Unit operations + lab	TD: BT PSB: BT	3	1	2	0	03	50	50	100	4
3	IPCC 21BT33	Biochemistry + lab	TD: BT PSB: BT	3	1	2	0	03	50	50	100	4
4	PCC 21BT34	Microbiology	TD: BT PSB: BT	3	1	0	0	03	50	50	100	3
5	PCC 21BTL35	Microbiology lab	TD: BT PSB: BT	0	1	2	0	03	50	50	100	1
6	JHV 21UH36	Social Connect and Responsibility	Any Department	0	0	1	0	01	50	50	100	1
7	HSMC 21KSK37/47	Samskrutika kannada	TD and PSB HSMC	1	0	0	0	01	50	50	100	1
	HSMC 21KKB37/47	Balake kannada										
	OR											
	HSMC 21CIP37/47	Constitution of India and Professional Ethics										
8	AEC21BT38X	Ability Enhancement Course - III	TD: BT PSB: BT	If offered as Theory Course				01	50	50	100	1
				1	0	0	1					
				If offered as lab. course				02				
				0	0	2	0					
Total									400	400	800	18

9	Scheduled activities for III to VIII semesters	NMDC 21NS83	National Service Scheme (NSS)	NSS	All students have to register for any one of the course namely National Service Scheme, Physical Education (PE)(Sports and Athletics) and Yoga with the concerned coordinator of the course during the first week of III semester. The activities shall be carried out between III semester to VIII semester (for 5 semesters). SEE in the above courses shall be conducted during VIII semester examinations and the accumulated CIE marks shall be added to the SEE marks. Successful completion of the registered course 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.							
		NMDC 21PE83	Physical Education (PE)(Sports and Athletics)	PE								
		NMDC 21YO83	Yoga	YOGA								

Course prescribed to lateral entry Diploma holders admitted to III semester B.E./B.Tech programs

1	NCMC 21MATDIP31	Additional Mathematics - I	Maths	02	02	--	--	---	100	---	100	0
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Note: BSC: Basic Science Course, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, INT –Internship, HSMC: Humanity and Social Science & Management Courses, AEC–Ability Enhancement Courses. UHV: Universal Human Value Course.

L –Lecture, T – Tutorial, P- Practical/ Drawing, S – Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination. TD- Teaching Department, PSB: Paper Setting department

21KSK37/47 Samskrutika Kannada is for students who speak, read and write Kannada and 21KKB37/47 Balake Kannada is for non-Kannada speaking, reading, and writing students.

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 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.) 2021-22 may be referred.

21INT49 Inter/Intra Institutional Internship: All the students admitted to engineering programs under the lateral entry category shall have to undergo a mandatory 21INT49 Inter/Intra Institutional Internship of 03 weeks during the intervening period of III and IV semesters. The internship shall be slated for CIE only and will not have SEE. The letter grade earned through CIE shall be included in the IV semester grade card. The internship shall be considered as a head of passing and shall be considered for vertical progression and for the award of degree. Those, who do not take up / complete the internship shall be declared fail and shall have to complete during subsequently after satisfying the internship requirements. The faculty coordinator or mentor shall monitor the students' internship progress and interact with them for the successful completion of the internship.

Non-credit mandatory courses (NCMC):

(A) Additional Mathematics I and II:

(1) These courses are prescribed for III and IV semesters respectively to lateral entry Diploma holders admitted to III semester of B.E./B.Tech., programs. They shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the Continuous Internal Evaluation (CIE). In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured an F grade. In such a case, the student has to fulfill the course requirements during subsequent semester/s to earn the qualifying CIE marks. These courses are slated for CIE only and have no SEE.

(2) Additional Mathematics I and II shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses shall be mandatory for the award of degree.

(3) Successful completion of the courses Additional Mathematics I and II shall be indicated as satisfactory in the grade card. Non-completion of the courses Additional Mathematics I and II shall be indicated as Unsatisfactory.

(B) National Service Scheme/Physical Education (Sport and Athletics)/ Yoga:

(1) Securing 40 % or more in CIE, 35 % or more marks in SEE and 40 % or more in the sum total of CIE + SEE leads to successful completion of the registered course.

(2) In case, students fail to secure 35 % marks in SEE, they have to appear for SEE during the subsequent examinations conducted by the University.

(3) In case, any student fails to register for NSS, PE or Yoga/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have not completed the requirements of the course. In such a case, the student has to fulfill the course requirements during subsequent semester/s to earn the qualifying CIE marks.

(4) Successful completion of the course shall be indicated as satisfactory in the grade card. Non-completion of the course shall be indicated as Unsatisfactory.

(5) These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses shall be mandatory for the award of degree.

ABILITY ENHANCEMENT COURSE – III

21BT381	Data presentation, Error Analysis and Inferences	21BT383	Biodiversity and Conservation Law
21BT382	Bio-Lab Management and Risk Assessment	21BT384	Linux programming for Biologists

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IV SEMESTER

IV 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	BSC 21BT41	Biostatistics and Design of experiments	TD, PSB- Maths	3	1	0	0	03	50	50	100	3
2	IPCC 21BT42	Python programming + lab	TD: BT PSB: BT	3	1	2	0	03	50	50	100	4
3	IPCC 21BT43	Cell biology &Cell culture techniques + lab	TD: BT PSB: BT	3	1	2	0	03	50	50	100	4
4	PCC 21BT44	Molecular biology &Genetic engineering	TD: BT PSB: BT	3	1	0	0	03	50	50	100	3
5	AEC 21BE45	Biology for engineers	BT, CHE, PHY	2	1	0	0	02	50	50	100	2
6	PCC 21BTL46	Molecular biology &Genetic engineering lab	TD: BT PSB: BT	0	1	2	0	03	50	50	100	1
7	HSMC 21KSK37/47	Samskrutika Kannada	HSMC	1	0	0	0	01	50	50	100	1
	HSMC 21KBK37/47	Balake Kannada										
	OR											
	HSMC 21CIP37/47	Constitution of India & Professional Ethics										
8	AEC21BT48X	Ability Enhancement Course- IV	TD: BT PSB: BT	If offered as theory Course				01	50	50	100	1
				1	0	0	1					
				If offered as lab. course				02				
				0	0	2	0					
9	UHV21UH49	Universal Human Values	Any Department	1	0	0	0	01	50	50	100	1
10	INT21INT49	Inter/Intra Institutional Internship	Evaluation By the appropriate authorities	Completed during the intervening period of II and III semesters by students admitted to first year of BE./B.Tech and during the intervening period of III and IV semesters by Lateral entry students admitted to III semester.				3	100	--	100	2
Total									550	450	1000	22

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

1	NCMC 21MATDIP41	Additional Mathematics - II	Maths	02	02	--	--	--	100	--	100	0
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Note: BSC: Basic Science Course, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, AEC –Ability Enhancement Courses, HSMC: Humanity and Social Science and Management Courses, UHV- Universal Human Value Courses.

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

21KSK37/47 Samskrutika Kannada is for students who speak, read and write Kannada and 21KBK37/47 Balake Kannada is for non-Kannada speaking, reading, and writing students.

Integrated Professional Core Course (IPCC): Refers to Professional Theory Core Course 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 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 (BE/B.Tech.) 2021-22 may be referred.

Non – credit mandatory course (NCMC):

Additional Mathematics - II:

(1) Lateral entry Diploma holders admitted to III semester of B.E./B.Tech., shall attend the classes during the IV semester to complete all the formalities of the course and appear for the Continuous Internal Evaluation (CIE). In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured an F grade. In such a case, the student has to fulfill the course requirements during subsequent semester/s to earn the qualifying CIE marks. These courses are slated for CIE only and have no SEE.

(2) Additional Mathematics I and II shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses shall be mandatory for the award of degree.

(3) Successful completion of the course Additional Mathematics II shall be indicated as satisfactory in the grade card. Non-completion of the courses Additional Mathematics II shall be indicated as Unsatisfactory.

Ability Enhancement Course – IV

21BT481	Hydroponics, Aquaponics and Aeroponics	21BT483	Biopesticides and Biofertilizers
21BT482	Quality Control and Quality Assurance	21BT484	R Programming for Biologists

Internship of 04 weeks during the intervening period of IV and V semesters; 21INT68 Innovation/ Entrepreneurship/ Societal based Internship.

(1) All the students shall have to undergo a mandatory internship of 04 weeks during the intervening period of IV and V semesters. The internship shall be slated for CIE only and will not have SEE. The letter grade earned through CIE shall be included in the VI semester grade card. The internship shall be considered as a head of passing and shall be considered for vertical progression and for the award of degree. Those, who do not take up / complete the internship shall be considered under F (fail) grade and shall have to complete during subsequently after satisfying the internship requirements.

(2) Innovation/ Entrepreneurship Internship shall be carried out at industry, State and Central Government /Non-government organizations (NGOs), micro, small and medium enterprise (MSME), Innovation centres or Incubation centres. Innovation need not be a single major breakthrough; it can also be a series of small or incremental changes. Innovation of any kind can also happen outside of the business world.

Entrepreneurship internships offers a chance to gain hands on experience in the world of entrepreneurship and helps to learn what it takes to run a small entrepreneurial business by performing intern duties with an established company. This experience can then be applied to future business endeavours. Start-ups and small companies are a preferred place to learn the business tactics for future entrepreneurs as learning how a small business operates will serve the intern well when he/she manages his/her own company. Entrepreneurship acts as a catalyst to open the minds to creativity and innovation. Entrepreneurship internship can be from several sectors, including technology, small and medium-sized, and the service sector.

(3) Societal or social internship.

Urbanization is increasing on a global scale; and yet, half the world's population still resides in rural areas and is devoid of many things that urban population enjoy. Rural internship is a work-based activity in which students will have a chance to solve/reduce the problems of the rural place for better living.

As proposed under the AICTE rural internship programme, activities under Societal or social internship, particularly in rural areas, shall be considered for 40 points under AICTE activity point programme.

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

V SEMESTER

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	
					L	T	P					
1	HSMC	18BT51	Bio-Business and Entrepreneurship	HSMC/Biotech	3	--	--	03	40	60	100	3
2	PCC	18BT52	Chemical Reaction Engineering	Chemical/Biotech	4	1	--	03	40	60	100	4
3	PCC	18BT53	Enzyme Technology & Biotransformation	Biotech	4	--	--	03	40	60	100	4
4	PCC	18BT54	Genomics & Proteomics	Biotech	3	1	--	03	40	60	100	3
5	PCC	18BT55	Bioanalytical Techniques	Biotech	3	--	--	03	40	60	100	3
6	PCC	18BT56	Genetic Engineering & Applications	Biotech	3	--	--	03	40	60	100	3
7	PCC	18BTL57	Biokinetics & Enzyme Technology Laboratory	Chemical/Biotech	--	2	2	03	40	60	100	2
8	PCC	18BTL58	Genetic Engineering and Cell Culture Laboratory	Biotech	--	2	2	03	40	60	100	2
9	HSMC	18CIV59	Environmental Studies	Civil/ Environmental [Paper setting: Civil Engineering Board]	1	--	--	02	40	60	100	1
					Examination is by objective type questions							
TOTAL					21	06	04	26	360	540	900	25

Note: BSC: Basic Science, PCC: Professional Core, HSMC: Humanity and Social Science, NCMC: Non-credit mandatory course.

continued

AICTE Activity Points to be earned by students admitted to BE/B. Tech./B. Plan. day college programme (For more details refer to Chapter 6, AICTE Activity Point Programme, Model Internship Guidelines):

Over and above the academic grades, everyday College regular student admitted to the 4 years Degree programme and every student entering 4 years Degree programme through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Programme. Students transferred from other Universities to fifth semester are required to earn 50 Activity Points from the year of entry to VTU. The Activity Points earned shall be reflected on the student's eighth semester Grade Card.

The activities can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hours' requirement should be fulfilled. Activity Points (non-credit) have no effect on SGPA/CGPA and shall not be considered for vertical progression.

In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

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Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2018 – 19)

Programme: BIOTECHNOLOGY

VI SEMESTER

VI 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	18BT61	Process Control & Automation	Chemical	4	1	--	03	40	60	100	4
2	PCC	18BT62	Bioprocess Equipment Design & CAED	Chemical	4	2	--	04	40	60	100	4
3	PCC	18BT63	Bioinformatics	Biotech	4	--	--	03	40	60	100	4
4	PEC	18BT64X	Professional Elective -I	Biotech	3	--	--	03	40	60	100	3
5	OEC	18BT65X	Open Elective -A	Biotech	3	--	--	03	40	60	100	3
6	PCC	18BTL66	Process Control & Automation Laboratory	Chemical	--	2	2	03	40	60	100	2
7	PCC	18BTL67	Bioinformatics Laboratory	Biotech	--	2	2	03	40	60	100	2
8	MP	18BTMP68	Mini-project	-	--	1	2	03	40	60	100	2
9	Internship	--	Internship		To be carried out during the vacation/s of VI and VII semesters and /or VII and VIII semesters.							
TOTAL					18	08	06	25	320	480	800	24

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project.

Mini-project work:

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini-project can be assigned to an individual student or to a group having not more than 4 students.

CIE procedure for Mini-project:

(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 Mini-project work, shall be based on the evaluation of project 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.

The CIE marks awarded for the Mini-project, shall be based on the evaluation of project 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)	
SEE for Mini-project: (i) Single discipline: Contribution to the Mini-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 Mini-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 belongs to. 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 -1	
Course code under18BT64X	Course Title
18BT641: Food Process Engineering	
18BT642: Phyto-Chemistry and Phyto-Harmones	
18BT643: Human Physiology	
Open Elective –A	
18BT651: Biology for Engineers	
18BT652: Biomaterials	
18BT653: Nanobiotechnology	
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 18BT65X). Selection of an open elective shall not be allowed if, • The candidate has studied the same course during the previous semesters of the programme. • The syllabus content of open elective is similar to that of Departmental core courses or professional electives. • A similar course, under any category, is prescribed in the higher semesters of the programme. Registration to electives shall be documented under the guidance of Programme Coordinator/ Advisor/Mentor.	
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	

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,			
• The candidate has studied the same course during the previous semesters of the programme. • The syllabus content of open elective is similar to that of Departmental core course/s or professional electives. • A similar course, under any category, is prescribed in the higher semesters of the programme. • Registration to electives shall be documented under the guidance of Programme Coordinator/ Advisor/Mentor.			
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.			

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VII 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	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: 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
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Programme: BIOTECHNOLOGY

VIII SEMESTER

III 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.