

Visvesvaraya Technological University, Belagavi

Bachelor of Science (B.Sc.)

Scheme of Teaching and Examinations 2021 – 2025

Outcome-Based Education(OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2021 – 22)

IV SEMESTER (Chemistry Major)

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical	Self-Study Component	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	DC	21BSC41	Environmental Chemistry	Chemistry	2	2	--		03	50	50	100	3
2	DC	21BSC42	Chemistry of S & P block elements & Nobel gases.	Chemistry	2	2	--		03	50	50	100	3
3	SSE	21BSS43x	Stream Specific Elective	Physics/Maths	2	1	--		03	50	50	100	2
4	DC	21BSCL44	Organic& Inorganic Chemistry Lab	Chemistry	1	--	2		03	50	50	100	2
5	ESC	21BSO45x	Open Elective (Eng. Stream)	Eng. Faculty	2	1	--		03	50	50	100	2
6	SEC	21SFH46	Scientific foundation of Health	Any department	2				03	50	50	100	2
7	SEC	21BCS47	Concepts of Bio-Chemistry	Chemistry and Biology	2	1	--		03	50	50	100	2
8	SEC	21CIP48	Constitution of India and Political Science	Humanities	2	--	--		03	50	50	100	2
Total					15	07	02		24	400	400	800	18

Note:	(1)	DC: Discipline Course, ESC: Engineering Science Course, SEC: Skill Enhancement Course,	
	(2)	Summer Internship – 1 All the students shall undergo a mandatory internship of 03 weeks during the intervening period of IV and V semesters. The Internship shall be slated for CIE only and will not have SEE. The grade earned through CIE shall be included in the V semester grade card. A Viva-voce, Report submission and Presentation shall be conducted during V th semester and the prescribed credit shall be included in the V th semester. The summer internship -1 shall be considered as a head of passing, vertical progression and for the award of the degree. Those who do not take up/complete the internship shall be declared fail and shall have complete Summer Internship-1 during the subsequent examination/s after satisfying the internship requirement.	
		Open Electives in Engineering Stream 21BSO451- Mathematical Modelling 21BSO452-Solar Energy Utilization 21BSO453-Print Technology (Any One)	Stream Specific Elective (a) 21BSS431-Concepts of Condensed Matter Physics (b) 21BSS433-Numerical Analysis & Analytical Geometry. (Any One)

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V SEMESTER (Chemistry Major)

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical	Self-Study Component	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	DC	21BSC51	Chemical Kinetics & Catalysis	Chemistry	2	2	--		03	50	50	100	3
2	DC	21BSC52	Coordination Compounds & Bioinorganic Chemistry	Chemistry	2	2	--		03	50	50	100	3
3	SSE	21BSS53x	Stream Specific Elective	Physics/ Maths	2	2	--		03	50	50	100	2
4	DC	21BSCL54	Physical & Inorganic Chemistry Lab	Chemistry	1	--	2		03	50	50	100	2
5	ESC	21BSO55x	Open Elective. (Engg.)	Engg Stream	2	--			03	50	50	100	2
6	OEC	21BSO561	Indian History	Humanities.	2	--			03	50	50	100	2
		21BSO562	Economics										
7	AEC	21BRM57	Research Methodology	P/C/M.	2	--	--		03	50	50	100	2
8	INT	21INT58	Summer Internship-1 (Inter/Intra Research Internship)	Completed during the intervening vacation of IV and V semesters					03	50	50	100	2
9	DC	21BSPR59	Research project 1,Phase-1	Chemistry		2*	--		03	50	---	50	-
Total					13	08	02		27	450	400	850	18

Note:	(1)	DC: Discipline Course, SSE: Stream Specific Elective ESC: Eng. Science Course, OEC: Open elective Course, AEC: Ability Enhancement Course, INT: Internship .SEC: Skill Enhancement Course *Refers to contact hours between student and guide.
	(2)	Research Project 1, Phase – 1: All the students admitted shall have to undergo a phase1of mandatory Research project 1 during the V th Semester. In Phase-1 the students are required to submit the title, synopsis, Literature Survey and work plan. Based on the ability/abilities of student/students and the recommendations of the mentor, a single discipline or a multidisciplinary research project 1 can be assigned to an individual student or to a group having not more than 4 students. The project is a laboratory-oriented course that will provide a platform to students to enhance their practical knowledge and skills by the development of small systems/ applications.
	(3)	Stream Specific Elective 21BSS531-Solid State Physics 21BSS533-Infinite Series, Fourier Analysis and Transforms.
		Open Electives in Engineering Stream (a) 21BSO551-Concepts of Cyber Security (b) 21BSO552-Data Science (c) 21BSO553- Food and Nutrition (Any One)

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VI SEMESTER(ChemistryMajor)

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week				Examination			Credits	
					Theory Lecture	Tutorial	Practical	Self-Study Component	Duration in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P	S					
1	DC	21BSC61	Chemistry of heterocyclic compounds	Chemistry	2	2	--		03	50	50	100	3
2	DC	21BSC62	Chemistry of materials	Chemistry	2	2	--		03	50	50	100	3
3	DC	21BSCL63	Organic Chemistry Lab	Chemistry	1	--	2		03	50	50	100	2
4	DSE	21BSC641	Medicinal Chemistry	Chemistry	2	--			03	50	50	100	2
		21BSC642	Functional Organic Compounds.										
5	SSE	21BSS65X	Stream Specific Elective	Physics/ Maths	2	--			03	50	50	100	2
6	OEC	21BSO661	Sociology	Humanities.	2	--			03	50	50	100	2
		21BSO662	Finance & Banking										
7	SEC	21IPR67	Intellectual Property rights	Interdisciplinary.	2	--	--		03	50	50	100	2
8	DC	21BRP68	Research project1, Phase-2	Chemistry	---	4*			03	50	50	100	4
Total					15	08	02		24	400	400	800	22

Note:	(1)	DC: Discipline Course, DSE: Discipline Specific Elective OEC: Open Elective Course SEC: Skill Enhancement Course. *Refer to contact hours between student and guide.
	(2)	Research Project1, Phase -2: Semester-end examination of research project 1 will have the submission of project report and viva voce presentation. The research project1 shall be considered as the head of passing for the award of degree. Those who do not take up/complete the mini-project shall be declared fail and shall have to complete the Research project 1 during the subsequent examination/s after satisfying the project requirement.
	(3)	Summer Internship – 2 Internship of 04 weeks during the intervening period of VI and VII semesters; 21INT77 Innovation/ Entrepreneurship/ Societal based Internship. (1)All the students shall undergo a mandatory internship of 04 weeks during the intervening period of VI and VII semesters. The internship shall be slated for CIE only and will not have SEE. The grade earned through CIE shall be included in the VII semester grade card. The internship shall be considered as a head of passing, vertical progression and 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/Societal 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. Societal/Rural internship is a work-based activity in which students will have a chance to identify the problems facing by the rural community and solve/reduce the identified problems through innovative ideas/projects/mechanisms.
	(4)	Stream Specific Elective 21BSS651-Spectroscopy 21BSS653-Linear Programming, Probability, and Statistics.

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VII SEMESTER (Chemistry Major)

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical	Self-Study Component	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	DC	21BSC71	Analytical Chemistry	Chemistry	2	2	--		03	50	50	100	3
2	DC	21BSC72	Electrochemistry	Chemistry	2	2	--		03	50	50	100	3
3	DC	21BSCL73	Analytical Chemistry Lab	Chemistry	1	--	2		03	50	50	100	2
4	DSE	21BSC741	Molecular Spectroscopy	Chemistry	2	1			03	50	50	100	3
		21BSC742	Photochemistry										
5	DSE	21BSC751	Chemistry of Nanomaterials	Chemistry	2	1			03	50	50	100	3
		21BSC752	Chemistry of Cosmetics and Perfumes										
6	SEC	21BSO761	Geography	Humanities	2	--	--		03	50	50	100	2
		21BSO762	Mass Communication & Journalism.										
7	INT	21INT77	Summer Internship-2 Innovation/ Entrepreneurship/ Societal based Internship	Completed during the intervening vacation of VI and VII semester				03	100	---	100	2	
8	DC	21BSRP77	Research Project 2,Phase-1	Chemistry		2*			03	50		50	-
Total					11	11	02		24	450	300	750	18

Note:	(1)	DC: Discipline Course, DSE: Discipline Specific Elective, SEC: Skill Enhancement Course. *Refer to contact hours between student and guide.
	(2)	Research project 2, Phase-1. All the students are required to submit the Title, synopsis and work plan. The objective of the project work is – To encourage the independent learning and innovative attitude of the students. To develop interactive communication, organization time management and presentation skills. To inspire independent and team working. To train the students to present the topic of project work in a seminar without any fear, and face the audience confidently.

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VIII SEMESTER (Chemistry Major)

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical	Self-Study Component	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	DC	21BSC81	Green Chemistry	Chemistry	2	2	--		03	50	50	100	3
2	DC	21BSC82	Nuclear & Radiation Chemistry	Chemistry	2	2			03	50	50	100	3
3	DC	21BSCL83	Electrochemistry lab	Chemistry	1	--	2		03	50	50	100	2
4	DSE	21BSC841	Polymer Chemistry & Composite Materials	Chemistry	2	2			03	50	50	100	3
		21BSC842	Advanced Material Chemistry										
5	DC	21BSRP85	Research Project 2, Phase-2	Chemistry		6*			03	50	50	100	6
6	NCMC	21NS86	NSS and PE	NSS and PE	Completed during the intervening period of III semesters to VIII semester.				--	50	50	100	--
		21NS86	NSS and Fine Arts	NSS and Humanities									
Total					07	12	2		15	300	300	600	17

Note:	(1)	DC: Discipline Course, DSE: Discipline Specific Elective *Refer to contact hours between student and guide.
	(2)	Research Project 2, Phase 2 – The semester end examination of research project phase 2 will have the submission of research project report and viva voce presentation. The research project shall be considered as head of passing for the award of the degree. Those who do not take up/complete the research project shall be declared fail and shall have to complete the research project 2 during the subsequent examination/s after satisfying the project requirements.

Non-credit mandatory courses (NCMC):**National Service Scheme/Physical Education (Sport and Athletics)/ Yoga/Fine Arts:**

(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 subsequently to earn the qualifying CIE marks subject to the maximum program period.

(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 a degree.