



Sarvodaya Kelavani Samaj Managed

Shri Manibhai Virani & Smt. Navalben Virani Science College, Rajkot

(Autonomous)

Affiliated to Saurashtra University, Rajkot

Reaccredited at the “A” Level (CGPA 3.28) by NAAC

“STAR” College Scheme & Status by MST-DBT

A College with Potential for Excellence – CPE (Phase - II) by UGC

Accredited at the G-AAA Highest Grade ‘A-1’ Level by KCG, Govt. of Gujarat

UGC-DDU KAUSHAL Kendra

GPCB-Government of Gujarat approved Environmental Audit Centre

SCHEME OF LEARNING AND EVALUATION

Of

B. Sc. Biochemistry

(w.e.f June 2021)

**Shri Manibhai Virani and Smt. Navalben Virani Science College, Rajkot
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Department of Biochemistry

B.Sc. BIOCHEMISTRY

VISION:

To be a prime centre in area of biochemical sciences by enhancing the quality of life through holistic education and research

MISSION:

- To encourage innovation and creativity towards better understanding of life at molecular level.
- To foster the culture of scientific understanding, curiosity and critical thinking for professional as well as academic excellence.
- To promote quality research and other scholarly activities for sustainable industrial development and healthy life style.
- To inculcate leadership, morality, spirituality, accountability, integrity and social equality among the students.

OBJECTIVES OF THE PROGRAMME:

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. Understand the basic concepts of life Science from molecular to organisms' level.
 2. Apply basic principle of analytical techniques and use effectively basic and modern laboratory instruments.
 3. Effectively use knowledge of Biochemistry in healthy living and better management of diseases.
 4. Design, perform simple experiments in clinical biochemistry and interpret data to derive conclusion.
- **Graduate attributes**
 - **Academic excellence:** Ability to identify key questions, research and pursue rigorous evidence-based arguments
 - **Critical Thinking and Effective communications:** Analysis and evaluation of information to form a judgement about a subject or idea and ability to effectively communicate the same in a structured form.
 - **Global Citizenship:** Mutual understanding with others from diverse cultures, perspectives and backgrounds

- **Life Long Learning:** Open, curious, willing to investigate, and consider new knowledge and ways of thinking

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

Our programme will produce Graduates who will attain following PEOs after few years of graduation	
PEO 1	: Core competency: will be competent in the field of biochemistry and allied areas by providing them hands on experience in basic tools and techniques.
PEO 2	: Breadth of knowledge: will critically analyse scientific data, draw objective conclusions and apply this knowledge for human welfare.
PEO 3	: Preparedness: Will reflect ability for research and entrepreneurship along with strong ethics and communication skills.
PEO 4	: Professionalism: will reveal strong professional ethics and moral duties that will positively affect their profession, community, society and Nation at large.
PEO 5	: Learning environment: will show attitude of lifelong learning to meet the ever evolving professional demands by developing ethical, interpersonal and team skills.

PROGRAM OUTCOMES:

After completion of the programme the Graduate will be able to :	
PO 1	: Domain knowledge: Demonstrate an understanding of fundamental biochemistry principles, including topics specific to chemistry and biochemistry.
PO 2	: Problem analysis: Identify and critically analyse pertinent problems in the various domains of life sciences.
PO 3	: Design/development of solutions: using appropriate tools and techniques as well as approaches to arrive at viable conclusions/solutions pertaining to life sciences.
PO 4	: Conduct investigations of complex problems: Cultivate the skills to Employ modern library search tools to locate and retrieve scientific information about a problem relating to biochemistry.
PO 5	: Modern tool usage: Ability to handle/use appropriate chemical and biochemical experiments using tools/techniques/equipment with an understanding of the standard operating procedures, safety aspects/limitations.
PO 6	: The Biochemist and society: Demonstrate the ability to understand the role of scientific developments, particularly, biological sciences in a changing world from the disciplinary perspective as well as in relation to its professional and everyday use.

PO 7	:	Environment and sustainability: Analyse the impact of scientific and technological advances on the environment and society and the need for sustainable development.
PO 8	:	Ethics: Commitment to professional ethics and responsibilities.
PO 9	:	Individual and team work: Exhibit the potential to effectively accomplish tasks independently and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	:	Communication: Communicate effectively in spoken and written form as well as through electronic media with the scientific community as well as with society at large. Demonstrate the ability to write dissertations, reports, make effective presentations and documentation.
PO 11	:	Project management and finance: Demonstrate knowledge and scientific understanding to identify research problems, design experiments, generation of new scientific insights or to the innovation of new applications of Biochemistry research and provide solutions. Exhibit organizational skills and the ability to manage time and resources.
PO 12	:	Life-long learning: Ability to retain and build on critical thinking skills, and use them to update scientific knowledge and apply them in day to day business.

PROGRAM SPECIFIC OUTCOMES (PSOs) for B. Sc. Biochemistry program

After completion of the program the Graduate will:		
PSO1	:	Communicate the fundamental concepts of biomolecules, enzymes, cell structure, organ system and metabolism.
PSO2	:	Undertake the experiments and derive conclusions by using classical and advanced instruments employed in the area of biochemistry, biotechnology, molecular biology and immunology.
PSO3	:	Understand, identify, formulate and solve the problems of endocrine disorders in the area of hormone biochemistry.
PSO4	:	Appreciate and apply understandings and skills of molecular diagnosis as well as analytical techniques for the development of professional and research career in environment, industry, agriculture and healthcare sector.
PSO5	:	Become competent and eligible to appear in various competitive exams, doing jobs in government and private sector of academia, research and industries

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SCHEME OF LEARNING AND EVALUATION**

For the students admitted from A.Y. 2021-2022 & onwards

Semester I									
Course Code	Course	Contact Hrs/ week			SEE Duration (Hours)	Maximum Marks			Credit(s)
		T	Tu	P		CIA	SEE	Total	
Part-I		T	Tu	P					
21UEN101	Development of Functional English	3	-	-	3	40	60	100	3
	Part-I Total	3	0	0		40	60	100	3
Part-II									
21UBCCC101	Core-1: Foundations of Biochemistry (F)	4	-	-	3	30	70	100	4
21UBCCC102	Core-2: Molecules of life (F)	4	-	-	3	30	70	100	4
21UBCID101	IDC-1: Botany	3	-	-	3	30	70	100	3
21UBCCC103	Core Practical-1: Basic Biochemistry Practical	-	-	6	6	40	60	100	3
21UBCID102	IDC-1 Practical:	-	-	6	3	40	60	100	2
	Core Enrichment 1: Concept to Practice Course	-	1	-	-	20	Evaluation at the end of Semester - IV		
	Part-II Total	11	1	12	--	190	330	500	16
Part-III: Ability Enhancement Courses									
	AECC I: Introduction to SDG (Online course)	-	-	-	-	-	-	Remarks	Audit course
21UAEES101	AECC II: Environmental Conservation and Sustainable Development	1	-	-	-	Evaluation at the end of Semester II			-
	AECC III: Human Values for Holistic	1	2*	-	-	Evaluation at the end of Semester II			-

	Living								
	Part-III Total	2	2*	0		00	0	0	0
	Total (Part-I to Part-III)	16	1+2*	12		230	390	600	19
		29				600			

* Out of working Hours

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Semester II									
Course Code	Course	Contact Hrs/ week			SEE Duration (Hours)	Maximum Marks			Credit(s)
		T	Tu	P		CIA	SEE	Total	
Part-I		T	Tu	P					
	Functional English	3	-	-	3	40	60	100	3
	Part-I Total	3	0	0	3	40	60	100	3
Part-II									
21UBCCC201	Core-3: Foundation Course	4	-	-	3	30	70	100	4
21UBCCC202	Core-4: Foundation Course	4	-	-	3	30	70	100	4
21UBCCC203	Core-5: Advance Course	4	-	-	3	30	70	100	4
21UBCID201	IDC-2:	3	-	-	3	30	70	100	3
21UBCCC204	Core Practical-2: Foundation Course Practical#	-	-	6	6	40	60	100	3
21UBCID202	IDC Practical-2:	-	-	6	3	40	60	100	2
	Core Enrichment 1: Concept to Practice Course	-	1	-	-	20	Evaluation at the end of Semester – IV		
	Part-II Total	15	1	12	--	220	400	600	20
Part-III: Ability Enhancement Courses									
21UAEES201	AECC II: Environmental Conservation and Sustainable Development	1	-	-	-	Remarks			2
	AECC III: Human Values for Holistic Living	1	2*	-	-	Remarks			3
	Part-III Total	2	2*	0	-	0	0	0	5
	Total (Part-I to Part-III)	20	1+2*	12	-	260	460	700	28
			33		-	700			

*Out of working Hours

3 hours each on Day1 and Day 2.

Minimum one month internship pertaining to learning for concept to practice/prototype or product development for start-up/mini and final semester project/skilling in the summer vacation/combination of semester break and summer vacation in industry/premier research institute/NGO, etc.

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Semester III									
Course Code	Course	Contact Hrs/ week			SEE Duration (Hours)	Maximum Marks			Credit(s)
		T	Tu	P		CIA	SEE	Total	
Part-I		T	Tu	P					
	Advanced English Language-I	3	-	-	3	40	60	100	3
Part-I Total		3	0	0	3	40	60	100	3
Part-II									
21UBCCC301	Core-6: Advance Course	4	-	-	3	30	70	100	4
21UBCCC302	Core-7: Advance Course	4	-	-	3	30	70	100	4
21UBCCC303	Core-8: Applied Course	4	-	-	3	30	70	100	4
21UBCDC301	DSE-1:	3	-	-	3	30	70	100	3
21UBCCC304	Core Practical-3: Advance + Applied Course Practical#	-	-	6	6	40	60	100	3
21UBCDC302	DSE-1 Practical:	-	-	6	3	40	60	100	2
	Core Enrichment 1: Concept to Practice:	-	1	-	-	20	Evaluation at the end of Semester – IV		
	Core Enrichment 2: Internship 1/ Training/ Project	-	-	-	-	100	-	100	1
Part-II Total		15	1	12	--	320	400	700	21
Part-III: Ability Enhancement Courses									
	FS 3: Career Acceleration Programme –CAP (Placement Training)	-	2	-	-				Audit course
Part-III Total		0	2	0	-	0	0	0	0

	Total (Part-I to Part-III)	18	3	12	-	360	460	800	24
		33		-	800				

*Out of working Hours

3 hours each on Day1 and Day 2.

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Semester IV									
Course Code	Course	Contact Hrs/ week			SEE Duration (Hours)	Maximum Marks			Credit(s)
		T	Tu	P		CIA	SEE	Total	
Part I									
	Advanced English Language-II	3	-	-	3	40	60	100	3
Part-I Total		3	0	0	3	40	60	100	3
Part-II									
21UBCCC401	Core-9: Advance Course	4	-	-	3	30	70	100	4
21UBCCC402	Core-10: Advance Course	4	-	-	3	30	70	100	4
21UBCDC401/ 21UBCDC402	Core Elective 1: Advance Course/ Advance Course	4	-	-	3	30	70	100	4
21UBCDC401	DSE 2:	3	-	0	3	30	70	100	3
21UBCTD401	TDE 1:	2	-	-	-	100	-	100	2
21UBCCC403	Core Practical-4: Advance Course Practicals#	-	-	6	6	40	60	100	3
21UBCDC403/ 21UBCDC404	Core Elective Practical-1 Advance Course/ Advance Course Practicals	-	-	4	3	40	60	100	2
21UBCDC402	DSE-2 Practical	-	-	4	2	40	60	100	2
	Core Enrichment 1: Concept to Practice Course	-	1	-	-	40	-	100	1
Part-II Total		17	1	14	-	380	460	900	25
Part-III: Ability Enhancement Courses									
	FS 3: Career Acceleration Programme –CAP (Placement Training)	-	2	-	-				Audit course
Part-III Total		0	2	0	-	0	0	0	0
Total (Part-I to Part III)		20	1+ 2*	14	-	420	520	1000	28

		35 + 2*	-	1000	
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*Out of working Hours

Minimum one month internship pertaining to learning for concept to practice/prototype or product development for start-up/mini and final semester project/skilling in the summer vacation/combination of semester break and summer vacation in industry/premier research institute/NGO etc.

3 hours each on Day1 and Day 2.

DSE cluster -1 & 2:

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Semester V									
Course Code	Course	Contact Hrs/ week			SEE Duration (Hours)	Maximum Marks			Credit(s)
						CIA	SEE	TOTAL	
Part-II		T	Tu	P					
21UBCCC501	Core-11: Applied Course	4	-	-	3	30	70	100	4
21UBCCC502	Core-12: Applied Course	4	-	-	3	30	70	100	4
21UBCCC503	Core-13: Advance Course - Self study	4	-	-	3	30	70	100	4
21UBCCC504	Core-14: Concept Recapitulation Test (CRT)	-	-	-	3	100	-	100	1
21UBCDC501/ 21UBCDC502	Core Elective 2: Applied Course/ Applied Course	4	-	-	3	30	70	100	4
21UBCTD501	TDE 2:	2	-	-	0	100	0	100	2
21UBCCC505	Core Practical-5 Applied Course Practical#	-	-	6	6	40	60	100	3
21UBCDC503/ 21UBCDC504	Core Elective Practical-2 Applied Course / Applied Course Practicals	-	-	4	3	40	60	100	2
	Core Enrichment 3: Internship /Training/Mini Project 2:	-	-	-	-	100	-	100	1
	Core Enrichment 4: Minor Project/Dissertation / Review Article / Instrumental Training	-	-	3	-	100	-	100	2
	Part-II Total	18	0	13	-	600	400	1000	27

Part-III: Ability Enhancement Courses									
	FS 3: Career Acceleration Programme –CAP (Placement Training)	-	2*	-	-	Remarks			Audit course
	Part-III Total	0	2*	0	-	0	0	0	0
	Total (Part-I to Part-III)	18	2*	13	-	600	400	1000	27
		31		-	1000				

*Out of working Hours

3 hours each on Day1 and Day 2.

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Semester VI									
Course Code	Course	Contact Hrs/ week			SEE Duration (Hours)	Maximum Marks			Credit(s)
		T	Tu	P		CIA	SEE	Total	
Part- II		T	Tu	P					
21UBCCC601	Core-16: Applied Course *	5	-	-	3	30	70	100	5
21UBCCC602	Core-17: Advance Course **	5	-	-	3	30	70	100	5
21UBCCC603	Core-18: Applied Course **	5	-	-	3	30	70	100	5
21UBCCC604	Core Practical-6 Advance +Applied Course Practical**			8	6	40	60	100	4
	Core Enrichment 5: Project **/ Skill training**	-	18*	-	0	300	0	300	14
	Part-II Total	15	18*	8		130/ 330	270/ 70	400	19
	Total (Part-II)	15	18*	8		130/ 330	270/ 70	400	19
		23				400			

* Compulsory for all

** Students can opt for Core-17, Core-18 and Core practical 6 or Core Enrichment 5.

Formation of Part-III

Course Code	Semester	Course / Component	Contact Hrs	No. of Courses	Credit/ Course	Total Credit(s)
A. Ability Enhancement Course (AEC)						
(i) Ability Enhancement Compulsory Course (AECC)						
	I	AECC I: Introduction to SDG (online course)	-	1	Remarks	Audit Course
	I & II	AECC II: Environmental Conservation and Sustainable Development	1 Hr / Week / Semester	1	1+1	2
	I & II	AECC III: Human Values for Holistic Living	1 T + 2 Tu /Week /Semester	1	1+1+1	3
					Sub Total	5 + Audit course
(ii) Skill Enhancement Course (SEC)						
As per common list	Any Semester between II – V/VII	SEC-I *Value Added Courses	40 Hrs	1	1	1
	Any Semester between III – V/VII	SEC-II **Co-Curricular Course	80 to 120 Hrs	1	2	2
					Sub Total	3
B. Finishing School						
FS I to FS IV Compulsory to Earn Degree.						
	I	FS I: Student Induction Program	3 weeks Phase 1, Phase 2, Phase 3	-	Remark	Audit course
	Across I & II Semesters	FS II: Orientation to Design Thinking (Online/Offline)	40 to 60 Hrs	1	Remark	Audit course
	Semesters I to V / VII	FS III: Career Acceleration Programme – CAP (Placement Training)	2 Hrs / Week /Semester	As per syllabus	Remarks	Audit course
	Semester	FS IV:	Twice a	1	Remarks	Audit course

	V (3 yrs program) Semester VI (4 yrs program)	Community Engagement	month			
FS V to FS VIII Options for Advanced Learners						
	Any semester from II to V	FS V: Indian & Foreign Languages	-	Any number of courses	Remarks	Audit course
	Any semester from II to V	FS VI: Any number of Online course(s) from select MOOC platforms	-	Any number of courses	Remarks	Credit as per provider/audit course
	Any semester from III to V	FS VII: Advanced Design Thinking	-	1	Remarks	Audit course
	Any semester from I to VI	FS VIII: #Extra Credit Course Any number of courses from any UG program across the University	Self study	Any number of courses	As per course offered	As per credit(s) earned across all courses opted
					Grand Total	

***Value Added Courses** - Option to student to choose at least 1 from a list of courses offered by any department across the University.

****Co-Curricular Courses** - Option to students to choose 1 from a list of courses offered by any department across the University.

Student may opt for any course of the odd/even prevailing semester from any UG program across the University with the following guidelines:

- a. Attending class not mandatory.
- b. May be mentored by the course teacher.
- c. Preparation through self-study.
- d. CIA not mandatory; evaluated for total marks at the end of the semester.
- e. Indicates options to appear for the course through examination application and payment of examination fees of that course.
- f. Credits earned through each course indicated in the consolidated mark sheet as extra credits; not included for CGPA, percentage marks and classification.

TOTAL MARKS & CREDIT DISTRIBUTION TO EARN THE DEGREE

S.No	PART	Total Marks	Total Credits
1.	PART I: Language Course	400	12
2.	PART II: Core, IDC, DSE, TDE	4000	128
3.	PART III: AECC-I, II & III SEC- I & II FS I, II, III & IV	Remarks	8 + Credit Audit
TOTAL		4400	148

COURSES OFFERED BY THE DEPARTMENT FOR OTHER PROGRAMS

Sr. No.	Name of Program	Semester	Course Code	Course Title	Contact Hrs/Week	Credits

VALUE ADDED COURSES (VAC) COURSES OFFERED BY THE DEPARTMENT

Sr. No.	Course Code	Course Title	Course Duration	Credits
1		Food Adulteration	40 Hours	
2				

CO-CURRICULAR COURSES (CoC) COURSES OFFERED BY THE DEPARTMENT

Sr. No.	Course Code	Course Title	Course Duration	Credits
1		Medical Lab Techniques	80 Hours	
2				