

**Detailed Program Scheme**  
**Bachelor of Science (B. Sc.)**  
**(Biotech)**

**Semester I- VI**  
**2020- 2021**

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**RNB GLOBAL UNIVERSITY**

RNB Global City, Ganganagar Road,  
Bikaner, Rajasthan 334601

## Document Release Notice

### Program Scheme for all Semesters

**Release: Version 1.0**

<b>Name of Program</b>	Bachelor of Science (Biotech)
<b>Abbreviated Program Name</b>	B.Sc. (Biotech)
<b>Updated on</b>	March'2020
<b>Approved By</b>	BOS

## **OVERVIEW**

RNB Global University follows Semester System along with Choice Based Credit System as per latest guidelines of University Grants Commission (UGC). Accordingly, each academic year is divided into two semesters, **Odd (July-December) and Even (January-June)**. Also, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

<b>Name of Program</b>	Bachelor of Science (Biotech)
<b>Duration of Program</b>	3 years
<b>Number of Semester</b>	6
<b>Total Credit of Program</b>	156

## **DETAILED CREDIT STRUCTURE**

<b>Year 1</b>	Semester I	26 credits
	Semester II	26 credits
<b>Year 2</b>	Semester III	24 credits
	Semester IV	26 credits
<b>Year 3</b>	Semester V	30 credits
	Semester VI	24 credits
<b>Total Credits</b>		156 Credits

## **PROGRAM OBJECTIVE**

The B.Sc. program has the objective of producing graduates who have acquired:

1. A deep understanding of fundamental concepts of Science and Mathematics.
2. Skill development in the use and application of Scientific Methods.
3. Advanced knowledge and experience of theoretical concepts proven by experimental results.
4. Provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.
5. The knowledge with facts and figures related to various subjects in pure sciences such as Physics, Chemistry, Mathematics, Zoology, Botany, Biotechnology etc. (whichever is applicable as per program chosen).
6. The basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
7. The skills in handling scientific instruments, planning and performing in laboratory experiments.
8. The skills of observations and drawing logical inferences from the scientific experiments.
9. Ability to think creatively (divergently and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems.
10. Realization of how developments in any science subject helps in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable development.
11. Knowledge of subjects in other schools such as humanities, performing arts, social sciences etc. can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.
12. Ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.
13. Various communication skills such as reading, listening, speaking, etc., which we will help in expressing ideas and views clearly and effectively.

## **DURATION OF THE PROGRAM/MAXIMUM DURATION**

The B.Sc. Program shall be of three years with six semesters. A student will be required to complete the program within minimum 3 years and maximum duration of 5 years from the date of first registration in the first Semester.

The student shall be required to undergo 5-6 weeks Summer Internship at the end of the second year (4th Semester) & submits its report in the 5<sup>th</sup> Semester.

An academic year consists of two semester, Odd Semester (July-Dec) and Even Semester (Jan-June). Duration of Each semester can increase or decrease. Generally each semester has 15-18 weeks of academic works.

The examination for the I<sup>st</sup>, III<sup>rd</sup>, and V<sup>th</sup> , semesters shall ordinarily be held in the month of November/December and of the II<sup>nd</sup> , IV<sup>th</sup> and VI<sup>th</sup> semesters in the month of April/May or on such dates as may be fixed by the University.

### **REGISTRATION AT THE START OF EVERY SEMESTER**

Every semester, students admitted to a program should register him/her for the next Semester. The student must also register for the elective courses, if any, (both discipline specific electives and open electives) that he/she wishes to take in that particular semester (especially in the final year/last 2 semesters).

### **PROMOTION FROM 1ST YEAR TO 2ND YEAR**

A student is eligible for promotion to next year, if he/she meets the below mentioned minimum CGPA Criteria (by combining odd and even semester).

- For promotion from 1<sup>st</sup> Year to 2<sup>nd</sup> year , Minimum CGPA of 4.0
- For promotion from 2<sup>nd</sup> Year to 3<sup>rd</sup> year , Minimum CGPA of 4.5

**Meaning :**If for a Student, if CGPA is 4.0 (**Minimum 40% marks are required to get promoted**) or more than 4.0 in 1<sup>st</sup>year having any number of subject backlog/fail , he/she shall be promoted to next year. That it is his/her choice to clear his/her backlog is summer semester or with semester end examination as per ODD backlog with ODD semester and EVEN Backlog in EVEN Semester.

If student CGPA is less than 4.0, having any number of backlog in the 1<sup>st</sup>year and CGPA is less than 4.5 in 2<sup>nd</sup>year, he/she must be appear in summer semester to clear backlog papers.

For promotion to 3<sup>rd</sup> Year, a student must have to clear all his/her paper of 1<sup>st</sup>year. Student cannot carry internal backlog to next year, he/she must clear his/her internal backlog before commencement of next year session.

### **TEACHING PEDAGOGY**

At RNB Global University the teaching pedagogy includes

- Teaching on white board,
- Explanation of scientific facts using power point presentation,
- Webinars,
- Seminars,
- Class room assignments,
- Home assignments,
- Quiz,
- Guest lectures,
- Activities

The University has a large library which includes thousands of books, along with digital library support through which students as well as faculties can approach national and international books and research journals so as to be updated with latest technologies and emerging scientific trends.

In the networking world of today, communication skills are becoming very important. A manager's main role is to communicate his/her vision and strategy to others and get them to work with him/her towards that vision. RNBGU places special importance on the communication and interpersonal skills of students by imparting subjects like 'Ability & Skill Enhancement'.

### **CONTINUOUS ASSESSMENT**

Continuous assessment means assessing aspects of students' knowledge and understanding throughout their course as opposed to a final examination. Continuous assessment looks at the student's overall capabilities in the form of regular assignments. It provides a more accurate and complete picture of the student's level and their understanding of what they have learned. Each assignment has original content based on a particular module or subject area and is evaluated by an expert coach. This allows the student to constantly and consistently demonstrate their level of knowledge which cannot be accomplished with a final examination alone. The continuous assessment of a student is accomplished by

- Regularity of student in classroom
- Class room assignment
- Home assignment
- Projects
- Experiments performed in the laboratories
- Maintenance of practical record book
- Presentations on course topics
- Overall behaviour towards classmates and faculty
- Participation in extracurricular activities

**Students can refer to the semester/year wise "Program Assignment chart"** to get a better idea on the format/style & number of assignments they need to take in a particular semester/year. The assignments are designed in such a way that helps in the holistic growth of the students along with creating confidence & bettering the communication skills.

### **ASE- Ability and Skill Enhancement**

Ability and Skill Enhancement (ASE) is the Umbrella under which various spikes like training modules on communication skills, business etiquettes, technical terminology, vertical study, understanding requirements of various specializations and many such topics are taught

which render in helping the students prepare for the Global Entrant. ASE has been conceptualized with a view to explore the dynamics and techniques of effective interpersonal communication and to reinforce confidence in students by concentrating on what works about the individual. We believe that students need to not only develop academically, but develop the ability to survive in the modern world.

**ASE aim is to enable students:**

1. To convert the conceptual understanding of communication into everyday practice to train students to ground concepts/ideas in their own experience.
2. To create a learner-language interface enabling students to exercise control over language use.
3. To train students to ground concepts/ideas in their own experience.
4. To exercise control over language use and sensitize students to the nuances of the four basic communication skills – Listening, Speaking, Reading and Writing.
5. To give them the skill sets that would help them climb up the ladder of material success.

Along with imparting education and academic proficiency to students, we prepare them for situations beyond academics also. Inclusion of co-curricular and extracurricular activities under ASE are facilitating a comprehensive development of students towards every perspective scenario. ASE focuses on communication skills, body language and gestures and presentation skills by teaching them the art of developing, creating and executing their presentation with a professional approach and attitude.

ASE Modules I To VI are specifically designed so as to gradually increase the learning approach of the student, helping students train their mind keeping themselves in the realistic world. It enables a student to develop key managerial qualities. The University mission is to promote ‘True Learning’ and discourage ‘Rot Learning’. Use of tutorials, assignments, debates, quizzes, presentations, case studies, projects, practical test, viva-voice and many more modern tools promotes the learning quotient among the students.

**This is one of the exclusive features of RNBGU’s skill enhancement efforts.**

**WORKSHOPS & SEMINARS**

Students are encouraged to attend and participate in workshops and seminar to inculcate number of good qualities among B.Sc. students. The benefits of attending workshops and seminars include:

- Encourage dialog
- Receive Fresh Perspective
- Develop New Ideas
- Improvement in Skills

- Developing Network for Career

Students get an opportunity to connect their theoretical knowledge with practicing managers. It enhances the confidence level of student's aspiring their dreams. It is always a nice option to exercise the textbook tools with technological knowhow. Students attending such workshops, seminars can demonstrate their capabilities and can further more update their knowledge through such platforms.

**This is one of the key features of RNBGU's learning pedagogy.**

### **SUMMER INTERNSHIP**

Students at RNB Global University have to take summer internships related to various scientific activities like interning at National Laboratories, Industries, NGO's etc and many more, which help them to

- Apply knowledge learned in the classroom
- Gain valuable work experience
- Decide if this is the right path for you
- Develop and build upon skills
- Get a foot in the door at a company
- Gain valuable networking contacts
- Obtain references for future job opportunities
- Learn about the world of work

Internships are taken after the end of the 4<sup>th</sup> semester for a period of 4-5 weeks. It carries 4 credits & the student needs to submit their Summer Internship Report in the 5<sup>th</sup> semester. For the ease of students understanding, Summer internship is evaluated for a total of 150 marks for Weekly Reports, Project report, Presentation & Viva Voce & later converted into grade & grade points as per the University Examination Policy.

Complete document/guidelines are available for the help/assistance of the students for SIP. **Students can refer to the B.Sc. Summer Internship & Project Instructions & Assistance Document** to get a better idea on the Formats, Style, Project reports, Marks breakup & scoring criteria, etc ;enabling students a better perspective & understanding on benefiting the maximum from such dedicated & sincere efforts by RNB Global University for organizing such Summer Internship program for its students.

**The complete SIP reporting & evaluation pattern is again a very unique & well-structured industry academia learning efforts of RNBGU.**



## **RESEARCH PROJECT & DISSERTATION**

Research projects and dissertations at BSc level prepares students to develop the habit of inquisitiveness and evolve them to become a self-learner. Students inculcate better communication skill and present himself or herself effectively in the scientific companies, government jobs to convince about his/her emerging ideas.

An undergraduate dissertation (or Bachelors dissertation) is essentially an extended piece of research and writing on a single subject. It is typically completed in the final year of a degree programme and the topic is chosen based on a student's own area of interest. It allows the student to explore a narrow topic in greater depth than a traditional module. The student works with a single supervisor chosen from their departmental faculty, and this individual provides guidance and support throughout the course of the research.

**The dissertation is optional, which can be taken in place of any one discipline elective/subject of 6 credits in the 6th Semester.**

## **SEMESTER WISE COURSE DETAILS**

### **Semester - I**

<b>S. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1.	13000401	Chemistry-I	4	0	0	4
2.	13000900	Chemistry-I Lab	0	0	4	2
3.	13003300	Biodiversity (Microbes, Algae, Fungi and Archegoniate)	4	0	0	4
4.	13003400	Biodiversity (Microbes, Algae, Fungi and Archegoniate) Lab	0	0	4	2
5.	13003900	Biotechnology and Human Welfare	4	0	0	4
6.	13004000	Biotechnology and Human Welfare Lab	0	0	4	2
7.	13002700	Ability & Skill Enhancement- I	2	0	0	2
8.	99002200	Business Communication (AECC)	4	0	0	4
9.	99002800	Workshops & Seminars	-	-	-	1
10.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
<b>Total</b>			<b>18</b>	<b>0</b>	<b>12</b>	<b>26</b>

### **Semester - II**

<b>S. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1.	13000700	Chemistry II	4	0	0	4
2.	13001100	Chemistry-II Lab	0	0	4	2
3.	13007300	Plant Anatomy and Embryology	4	0	0	4
4.	13007400	Plant Anatomy and Embryology Lab	0	0	4	2
5.	13005900	Biochemistry & Metabolism	4	0	0	4
6.	13006000	Biochemistry & Metabolism Lab	0	0	4	2
7.	99001900	Environmental Studies	4	0	0	4
8.	13002800	Ability & Skill Enhancement - II	2	0	0	2
9.	99002800	Workshops & Seminars	-	-	-	1
10.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
<b>Total</b>			<b>18</b>	<b>0</b>	<b>12</b>	<b>26</b>

**Semester - III**

S. No.	Course Code	Course Name	L	T	P	Credits
1.	13001300	Chemistry-III	4	0	0	4
2.	13001400	Chemistry-III Lab	0	0	4	2
3.	13008700	Plant Physiology and Metabolism	4	0	0	4
4.	13008800	Plant Physiology and Metabolism Lab	0	0	4	2
5.	13007700	Genetics	4	0	0	4
6.	13007800	Genetics Lab	0	0	4	2
7.	13002900	Ability & Skill Enhancement - III	2	0	0	2
8.	13006200	Basic Instrumentation Skills	2	0	0	2
9.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
10.	99002800	Workshops & Seminars	-	-	-	1
<b>Total</b>			<b>16</b>	<b>0</b>	<b>12</b>	<b>24</b>

**Semester - IV**

S. No.	Course Code	Course Name	L	T	P	Credits
1.	13002000	Chemistry-IV	4	0	0	4
2.	13002100	Chemistry-IV Lab	0	0	4	2
3.	13015000	Environmental Biotechnology	4	0	0	4
4.	13015100	Environmental Biotechnology Lab	0	0	4	2
5.	13009100	Molecular Biology	4	0	0	4
6.	13009200	Molecular Biology Lab	0	0	4	2
7.	13003000	Ability & Skill Enhancement IV	2	0	0	2
8.	13011200	Research Methodology in Biotechnology	2	0	0	2
9.	13014500	Renewable Energy and Energy Harvesting	2	0	0	2
10.	99002800	Workshops & Seminars	-	-	-	1
11.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
<b>Total</b>			<b>18</b>	<b>0</b>	<b>12</b>	<b>26</b>

**Semester -V**

S. No.	Course Code	Course Name	L	T	P	Credits
1.	13012200	Summer Internship or Summer Project	0	0	8	4
2.	-	Discipline Specific Core Course-I Elective I	4	0	0	4
3.	-	Discipline Specific Core Course-I Elective I Lab	0	0	4	2
4.	-	Discipline Specific Core Course-II Elective I	4	0	0	4
5.	-	Discipline Specific Core Course-II Elective I Lab	0	0	4	2
6.	-	Discipline Specific Core Course-III Elective I	4	0	0	4
7.	-	Discipline Specific Core Course-III Elective I Lab	0	0	4	2
8.	13012100	Biological Databases and their Management	2	0	0	2
9.	13003100	Ability & Skill Enhancement - V	2	0	0	2
10.	13010000	Application of IT Skills in Sciences	1	0	0	1
11.	13010100	Application of IT Skills in Sciences Lab	0	0	2	1
12.	99002800	Workshops & Seminars	-	-	-	1
13.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
<b>Total</b>			<b>17</b>	<b>0</b>	<b>22</b>	<b>30</b>

**Semester -VI**

S. No.	Course Code	Course Name	L	T	P	Credits
1.	-	Discipline Specific Core Course-I Elective II	4	0	0	4
2.	-	Discipline Specific Core Course-I Elective II Lab	0	0	4	2
3.	-	Discipline Specific Core Course-II Elective II	4	0	0	4
4.	-	Discipline Specific Core Course-II Elective II Lab	0	0	4	2
5.	-	Discipline Specific Core Course-III Elective II	4	0	0	4
6.	-	Discipline Specific Core Course-III Elective II Lab	0	0	4	2
7.	13003200	Ability & Skill Enhancement - VI	2	0	0	2
8.	13015600	Intellectual Property Rights	2	0	0	2
9.	99002800	Workshops & Seminars	-	-	-	1
10.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
<b>Total</b>			<b>16</b>	<b>0</b>	<b>12</b>	<b>24</b>

**Note:** The dissertation is optional, which can be taken in place of any one discipline elective/subject of 6 credits in the 6th Semester.

### Discipline Specific Electives

Subject	Course Code	Course Name
Chemistry	13007000	<b>Chemistry of Main Group Elements, Theories of Acids and Bases (DSE I)</b>
	13007100	<b>Chemistry of Main Group Elements, Theories of Acids and Bases Lab (DSE I)</b>
	13016300	Polymer Chemistry
	13016400	Polymer Chemistry Lab
	13009700	<b>Organometallics, Bioinorganic chemistry, Polynuclear, hydrocarbons and UV, IR Spectroscopy (DSE II)</b>
	13009800	<b>Organometallics, Bioinorganic chemistry, Polynuclear, hydrocarbons and UV, IR Spectroscopy Lab (DSE II)</b>
	13016500	Green Chemistry
	13016600	Green Chemistry Lab
Botany	13011500	<b>Immunology (DSE I)</b>
	13011600	<b>Immunology Lab (DSE I)</b>
	13011300	Cell and Molecular Biology
	13014000	Cell and Molecular Biology Lab
	13017700	Research Methodology
	13017800	Research Methodology Lab
	13014800	<b>Economic Botany and Biotechnology (DSE II)</b>
	13014900	<b>Economic Botany and Biotechnology Lab (DSE II)</b>
	13017500	Analytical Techniques in Plant Sciences
	13017600	Analytical Techniques in Plant Sciences Lab
Biotechnology	13011900	<b>Bioinformatics (DSE I)</b>
	13012000	<b>Bioinformatics Lab (DSE I)</b>
	13017900	Plant Biotechnology
	13018000	Plant Biotechnology Lab
	13015400	<b>Genomics and Proteomics (DSE II)</b>
	13015500	<b>Genomics and Proteomics Lab (DSE II)</b>
	13018100	Environmental Biotechnology
	13018200	Environmental Biotechnology Lab

## **EVALUATION SCHEME-THEORY**

The evaluation of the theory paper of B.Sc. program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

### **Internal Assessment- Semester I**

The distribution of Internal Assessment Marks is as follows:

<b>Type</b>	<b>Details</b>	<b>Marks</b>
Mid Term	One Mid-term Sessional	25
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	20
Attendance	75% + : 5 marks	5
<b>TOTAL</b>	<b>50</b>	

### **Internal Assessment- Semester II- VI**

The distribution of Internal Assessment Marks is as follows:

<b>Type</b>	<b>Details</b>	<b>Marks</b>
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+ : 5 marks	5
<b>TOTAL</b>	<b>50</b>	

### **External Assessment- Semester I- VI**

Type	Marks
Theory	50

### **EVALUATION SCHEME -PRACTICAL**

The evaluation of the practical paper of B.Sc. program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

### **Internal Assessment- Semester I- VI**

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	45
Attendance	75%+ : 5 marks	5
<b>TOTAL</b>	<b>50</b>	

### **External Assessment- Semester I- VI**

Type	Marks
Practical	50

### **EVALUATION SCHEME- WORKSHOPS & SEMINARS AND HUMAN VALUES & SOCIAL SERVICE/NCC/NSS**

1. The evaluation of Workshops & Seminar and Human Values & Social Service/NCC/NSS will be completed from Semester I – Semester VI. It will be evaluated internally by the various Forums & Schools Concerned. The credit for this will be given at the end of each Semester.
2. The students have to join club/clubs/Forums with the active participation in different activities of club. The students would be continuously assessed from

Semester-I to Semester-IV and credits and marks would be given after the end of each Semester.

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