SRI BALAJI VIDYAPEETH
(Deemed to-be University)

School of Biological Sciences

B.Sc Biological Sciences

M.Sc Biological Sciences

Integrated M.Sc Biological Sciences

P.G.Diploma in Bio-Industrial Applications

PROSPECTUS

(Academic year 2021-2022)

UNDER CHOICE BASED CREDIT SYSTEM

PREFACE

We are delighted to introduce the 2021-22 academic session of the Bachelor of Science (Biological Sciences), Master of Science (Biological Sciences), Master of Science (Biological Sciences) (5-year Integrated) and P.G.Diploma (Bio-Industrial Applications) Programs of the School of Biological Sciences at Sri Balaji Vidyapeeth (SBV), Puducherry

INTRODUCTION

A large number of young men and women enter the education system in India through undergraduate colleges and universities. This collective is the mainstay of national development. The character and quality of education they are imparted with at the undergraduate level, make a major impact on the direction of the country's progress.

In this context, School of Biological Sciences (SBS) offers a unique 3-years Bachelor of Science in Biological Sciences, 2-years Master of Science in Biological Sciences, Master of Science in Biological Sciences (5-year Integrated) and 1-year P.G.Diploma in Bio-Industrial Applications program. All the programs are embedded in an ambience of a **mature and highly sophisticated research culture** which has an equally strong base of science, medicine and engineering.

SBS is **an open and free academic environment** where dedicated teaching, state-of-the-art laboratories, fast information networks and well-stocked libraries will come into being, aided by a flexible and enabling mode of administrative functioning. We believe that this unique academic environment should be utilized to impart high-quality training to inquisitive young minds at the undergraduate level.

The institutional doors will remain open not only to faculty from other disciplines but also to scholars and practitioners from universities and industries situated near or elsewhere, nationally and internationally. An academic environment that is open, free, pedagogic and non-hierarchical is envisioned.

CONTENT WITH PAGE NUMBER

1. SALIENT FEATURES OF THE PROGRAM

- SBS has designed the programs to strengthen a new type of training where mentoring and tutoring with active research is an integral part of the academic life of a student.
- The proposed programmes are designed to provide deep thinking experience through an interdisciplinary learning and skill development to students.

B.Sc. in Biological Sciences

- This would be a three-year choice-based credit system program organized into six semesters.
- A sound exposure of students to the fundamentals of scientific, management and engineering principles takes place in the first 4 semesters. The students would be introduced with core specialization in the advanced areas of Biological Sciences.
- Final semester is assigned exclusively to a project-based learning including project dissertation, industry/hospital visit and portfolio writing.
- All semesters include strong components of laboratory demonstration and hands-on experimental work.

M.Sc. in Biological Sciences

- The Master of Science (Biological Sciences) Program is a **two-year choice-based credit system program organized into four semesters**.
- A sound exposure of students to the fundamentals of scientific, management and engineering principles takes place in the first three semesters. From second semester onwards, student will carry out project dissertation, industry/hospital visit and portfolio writing.
- All semesters include strong components of laboratory demonstration and hands-on experimental work.

M.Sc. in Biological Sciences (5-year Integrated)

- This would be a five-year choice-based credit system program organized into ten semesters.
- A sound exposure of students to the fundamentals of scientific, management and engineering principles takes place in the first 4 semesters. The students would be introduced with core specialization in the advanced areas of Biological Sciences.
- Sixth semester is assigned exclusively to a project-based learning including project dissertation, industry/hospital visit and portfolio writing.
- In the 7^{th}, 8^{th} & 9^{th} semester, a sound exposure of students to **scientific, management and engineering principles** will be provided. The students would be introduced with core

specialization in the advanced areas of Biological Sciences. 10th semester is assigned exclusively to a project-based learning including research project dissertation and industry/hospital visit.

- All semesters include strong components of laboratory demonstration and hands-on experimental work.

P.G. Diploma in Bio-Industrial Applications

- The P.G. Diploma in Bio-Industrial Applications program is a **one-year choice-based credit system program organized into two semesters**.
- The first semester deals with a wide range of science and technology knowledge and in line with government policy and people's aspirations in modernizing the industry based applied biology. Second semester includes extensive industrial-oriented project dissertation and internship.
- Both the semesters include strong components of laboratory demonstration and hands-on experimental work.

2. CAREER PROSPECTS

- **Academic Opportunities:** The Biological Sciences Program graduates with their solid foundation and multidisciplinary training can either embark on a career of their choice or pursue advanced degrees such as M.Sc., PhD in their chosen discipline and allied interdisciplinary areas anywhere in the world. The extensive course curriculum, in conjunction with a strong laboratory module and exposure to modern instrumentation and research, will prove to be of immense value to students in either pursuit. The opportunity to engage in an intense research project and internship in an inspiring environment will enable students to make intelligent career choices, especially pertaining to research and development.
- **Industry Opportunities:** To meet the growing demand for a broad-based human resource pool with strong analytical skills, personnel who are competent enough to specialize quickly in specific fields of expertise are envisaged. Given this emerging industrial scenario, graduates of the Biological Sciences Program with their multidisciplinary training will be ideally suited for recruitment by modern industry.
- Commercial sectors that actively seek out graduates from the life sciences include the pharmaceutical, biotechnology, food, water and agriculture industries for roles such as process engineers, biotechnologist, QA specialist and clinical researcher.
- There is also demand for life science graduates to contribute to the public understanding of science as journalist, scientific writers and information/liaison officers.
- Financial and legal sectors also require analysts with life science knowledge for risk assessments, patents for molecular biology and biotechnology used for drug and medical applications.

3. POTENTIAL EMPLOYERS

Some **industries employing biologists** are Bivcol, Cadila IDPL, Sun Pharma, Thapar Group, Biocon India Ltd, Hindustan Lever, and Hindustan Antibiotics.

Medical Biotech industry includes Bayer, Cadila, DuPont, Monsanto, Novartis, Pfizer, Piramal, Ranbaxy, Torrent, Unilever, Workhardt, Glaxo, Wellcome.

Leading companies in the agriculture biotechnology include SPIC, Dupont, Pro Agro, EID Parry, ITC Zeneca, Pioneer Hybred, Hindustan Lever, and Hoechst Schering

4. REGULATIONS

ELIGIBILITY FOR ADMISSION:

B.Sc in Biological Sciences: 12th Pass with 50% aggregate in Maths, Physics, Chemistry, Biology/Computer Sciences

M.Sc in Biological Sciences: An aggregate of 6.0 CGPA/50% marks in any branch of Life Sciences.

Integrated M.Sc in Biological Sciences: 12th Pass with 50% aggregate in Maths, Physics, Chemistry, Biology/Computer Sciences

P.G.Diploma in Bio-Industrial Applications: Undergraduate degree in any branch of Life Sciences/Chemical Sciences/Pharmaceutical Sciences/Chemical Engineering/Computer Science.

MODE OF SELECTION:

- Based on the merit list of candidates drawn from the common entrance test and counseling conducted by Sri Balaji Vidyapeeth, Puducherry.

DURATION OF THE COURSE:

- B.Sc. Biological Sciences is a three-year full-time academic semester-based program.
- M.Sc Biological Sciences is a two year full time academic semester based program.
- Integrated M.Sc. Biological Sciences is a five-year full-time academic semester-based program.
- P.G.Diploma in Bio industrial Applications is a One-year full time academic semester-based program

MINIMUM WORKING DAYS IN AN ACADEMIC YEAR:

- Each academic year shall consist of not less than 180 working days (Minimum 90 working days per semester).

ATTENDANCE REQUIRED FOR APPEARING EXAMINATION:

- Examination will be conducted in both theory and practical as prescribed.
- Candidates will be permitted to appear for the University Examinations in the subject, only if they secure not less than 80% of attendance in each subject of the respective year.
- A student who does not meet the minimum attendance requirement in a year must repeat the course along with the next batch of students.

CONDONATION FOR LACK OF ATTENDANCE:

- Condonation of shortage of attendance in aggregate up to 10% (between 70% and 80%) in each semester may be granted by the UGCC and as per the regulations of University.

INTERNAL ASSESSMENT:

- Internal assessment will be done in each subject of study and the marks will be awarded to the candidates as detailed in the scheme of examinations.
- The marks awarded will be on the basis of the candidate's performance in the assignments, class tests, laboratory work, preparation and presentation of seminars as assessed by the teachers.

EXAMINATIONS:

- The exams will be conducted at the end of each semester. Make-up examination for failed candidates will be conducted in the subsequent semester. There is provision for carryover of failed subjects.
- The University Practical Examinations shall be jointly conducted by internal and external examiners duly appointed by the University.

MAXIMUM DURATION FOR THE AWARD OF THE DEGREE:

1. **B.Sc:** The maximum period to complete the course successfully should not exceed a period of six years from the date of joining first year.
2. **M.Sc:** The maximum period to complete the course successfully should not exceed a period of four years from the date of joining first year.
3. **Integrated M.Sc:** The maximum period to complete the course successfully should not exceed a period of ten years from the date of joining first year.
4. **P.G.Diploma:** The maximum period to complete the course successfully should not exceed a period of two years from the date of joining first year.

5. CRITERIA FOR PASS

- 50% of marks in aggregate in University Theory, Internal assessment (Theory), Viva-voce examination taken together. The students must also obtain a minimum of 50% in each theory paper.
- 50% of marks in aggregate in the University Practical examination, internal assessment (Practical) and Record marks taken together.

6. RESEARCH PROJECT DISSERTATION

- The students do a research project in the area of their specialization in the final semester of the program. All the inquiry skills developed in all semesters would enable students to frame questions, creatively explore answers and communicate this coherently to both learned and uninitiated audiences.
- Research project dissertation and Industrial/Hospital visit identifies the SBS program as a uniquely research based one.

7. KEY AREAS IN CURRICULUM

The institute will prepare individuals who have a deep and genuine interest in discovery science. These students will engage themselves to shape the translation of biology through academic learning and research. Such engagement will contribute towards applications for a knowledge economy, business development and science of tomorrow.

8. COURSE STRUCTURE

B.Sc. Biological Sciences

<table>
<tr><th>Semester I</th><th>Semester II</th><th>Semester III</th><th>Semester IV</th><th>Semester V (paper I)</th><th>Semester VI (paper II)</th></tr>
<tr><td>Laboratory Techniques & Instrumentation- I</td><td>Laboratory Techniques & Instrumentation -II</td><td>Immunology -I</td><td>Immunology- II</td><td colspan="2" rowspan="2">Core Course:
• Regulatory Sciences
• Bioeconomy & Entrepreneurship
Any Two Core Electives:
1. Biopharmaceuticals
2. Bioprocessing Technology
3. Biodesign & Medical Devices
4. Computational Biology
5. Genetic Engineering
6. Stem Cell Biology
7. Synthetic Biology
8. Vaccines & Diagnostics</td></tr>
<tr><td>Foundations of Biology -I</td><td>Foundations of Biology -II</td><td>Molecular Biology– I</td><td>Molecular Biology - II</td></tr>
<tr><td>Biophysics and biochemistry –I</td><td>Biophysics and biochemistry-II</td><td>Introduction to Bioinformatics</td><td>Introduction to Omics</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>Microbiology -I</td><td>Microbiology -II</td><td>Biomathematics and biostatistics</td><td>Principles of Biomedical engineering</td></tr>
<tr><td>English (AECC)</td><td>Environmental Sciences (AECC)</td><td>A. Biosafety & Biomedical waste management
B. Good laboratory practices
C. Industrial health management (SEC)</td><td>A. Industry trend & market analysis
B. Pandemic disease & intervention
C. Lab & project management (SEC)</td><td colspan="2">A. Biodiversity
B. Ethics & IPR
C. Health & Wellness
D. Chemical Biology (DEC)</td></tr>
<tr><td>One GEC</td><td>One GEC</td><td>Two SEC</td><td>Two SEC</td><td>One DEC</td><td>One DEC</td></tr>
<tr><td colspan="6">Project work & dissertation; Portfolio writing; Visits to hospitals & Bio-industry
AECC- Ability Enhancement Compulsory Course; GEC- Generic Elective Course; SEC- Skill Enhancement Course; DEC- Discipline Elective Course</td></tr>
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M.Sc. Biological Sciences

Semester I	Semester II	Semester III	Semester IV
Cell & Molecular Biology	Molecular Diagnostics	Stem Cell Biology	Bioethics, Biosafety & IPR
Genetics & Recombinant DNA Technology	Biopharmaceutics & Therapeutics	Bio-design & Bio-Engineering	Industrial Visit
Developmental Biology & Physiology	Bioprocess Technology	Computational Biology & Data Science	Dissertation
Immunology & Immunotechnology	Regulatory Sciences	Bio-economy & Entrepreneurship	
One DEC One GEC	Research Methodology	One DEC One SEC	

During the course, the students will undergo Discipline specific elective paper (to choose one) (DEC), Generic elective paper (to choose one) (GEC) and skill elective paper (to choose two) (SEC) namely

(a) Ethics & IPR
(b) Scientific reading/ writing
(c) Environmental Sciences
(d) English Communication
(e) Biosafety & Biomedical waste management
(f) Good laboratory practices
(g) Industrial health management
(h) Lab & project management

M.Sc. Biological Sciences (5-year Integrated)

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<tr><th>Semester I</th><th>Semester II</th><th>Semester III</th><th>Semester IV</th><th>Semester V (paper I)</th><th>Semester VI (paper II)</th><th>Semester VII</th><th>Semester VIII</th><th>Semester IX</th><th>Semester X</th></tr>
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• Regulatory Sciences
• Bioeconomy & Entrepreneurship
Any Two Core Electives:
9. Biopharmaceuticals
10. Bioprocessing Technology
11. Biodesign & Medical Devices
12. Computational Biology
13. Genetic Engineering
14. Stem Cell Biology
15. Synthetic Biology
16. Vaccines & Diagnostics</td><td>Cell & Molecular Biology</td><td>Molecular Diagnostics</td><td>Stem Cell Biology</td><td>Bioethics, Biosafety & IPR</td></tr>
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<tr><td>English (AECC)</td><td>Environmental Sciences (AECC)</td><td>Biosafety & Biomedical waste management Good laboratory practices Industrial health management (SEC)</td><td>Industry trend & market analysis Pandemic disease & intervention Lab & project management (SEC)</td><td>One DEC
One GEC</td><td>Research Methodology</td><td>One DEC
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P.G. Diploma in Bio-Industrial Applications

SEMESTER I	SEMESTER II
Biopharmaceuticals & Therapeutics	Research Methodology
Biodesign, Medical Devices & Diagnostics	Dissertation
Biorisk Management & Disease Modelling	Internship
Regulatory Sciences	
Bio-economy & Entrepreneurship	
Bioprocessing & Scale-up	

9. OPTIONAL M.Sc INTEGRATED

Students who complete all the requirements for the award of the Bachelor of Science (Biological Sciences) degree have the option of getting an integrated Master of Science degree in Biological Sciences by continuing the course for two more years as per norms.

10.FEES STRUCTURE

Fee Structure	B.Sc	M.Sc	M.Sc (Int.)	P.G.Diploma
Tuition Fee	200000	150000	200000	50000
Other Academic Fee	3000	4500	3000	4500
Students' Fund	500	300	500	300
Statutory Deposit	5000	7500	5000	7500
Library Deposit	5000	5000	5000	5000
Laboratory deposit	10000	10000	10000	10000
Group Medical Policy Premium	1000	1500	1000	1500
Health Club Fee	500	1200	500	1200
Miscellaneous	15000	20000	15000	20000
Total as per duration of each course	**Rs. 2,40,000**	**Rs. 2,00,000**	**Rs. 2,40,000**	**Rs. 1,00,000**
Fees per semester	**Rs. 40,000**	**Rs. 50,000**	**Rs. 40,000**	**Rs. 50,000**

FEE PAYMENT SCHEDULE:

Fees payment schedule is permitted in two installments and the necessary fees to be paid within one week of the commencement of semester classes. Fees once paid shall not be claimed back under any circumstances.

11. APPLICATION FEES

B.Sc	M.Sc/ M.Sc (Int.)	PG Diploma
Rs. 500	Rs. 1000	Rs. 500

Limited candidates will be considered for selection based on an entrance test.

The prospectus and application forms are available on our website http://sbvu.ac.in/sbs

12.PRIVILEGES AND RESPONSIBILITES

- All students are bound by the rules and regulations framed by the Institute.
- During the tenure of their studentship, students are eligible for the following:
    - ✓ Residence in the Hostel as per hostel rules, subject to availability
    - ✓ Membership of the health club
    - ✓ Participation in the activities of the Students' Council
    - ✓ Leave privileges as may be applicable from time to time
    - ✓ Limited assistance through the Special Medical Care Scheme

11.CONTACT DETAILS

Office of SBS, SBS Admissions Cell,

Administrative wing 1st Floor, Hospital Block,

Mahatma Gandhi Medical College & Research Institute,

Sri Balaji Vidyapeeth,

SBV Campus,

Pillaiyarkuppam, Puducherry 607402

Ph.No: 0413-2615449-458

Email id: sbso@sbvu.ac.in

Website: http://sbvu.ac.in/sbs