DEPARTMENT OF BOTANY

LAHORE COLLEGE FOR WOMEN UNIVERSITY, LAHORE

SELF-ASSESSMENT REPORT

BS

Submitted to

Quality Enhancement Cell,

Lahore College for Women University, Lahore

Dated: _____

Program Team Members:

1. Dr. Sumera Iqbal (Team Leader)
2. Dr. Khajista Jabeen
3. Dr. Samina Sarwar

Head of the Department: Prof. Dr. Farah Khan

T A B L E O F C O N T E N T S

CRITERION 1: PROGRAM MISSION, OBJECTIVES AND OUTCOMES
INTRODUCTION

1. Department of Botany

Botany department was started in 1922. Bachelors in the subject of Botany (B.Sc.) was started in 1956. MSc was launched in 1994. BS Botany, a four years degree program started in 2005. Where as MS, MS leading to PhD and Ph.D. programs were started in 2009.

Mission

The mission of the department is

- To teach traditional and advanced concepts in plant sciences.
- To perform basic and applied research for advancement in the field of Botany
- To provide trained manpower for Educational research, Forest, Agriculture & industrial organizations and other sectors such as medicinal research, textile sector, leather industry, pharmaceutical and biotechnological companies.
- To conduct activity centered programs where observation and experimentation are stressed.

OBJECTIVES

In Science classes, students are traditionally expected to learn scientific facts. In modern days, textbooks and internet facilities are useful tools for helping students to learn. The courses content in various formats incorporate a wide variety of learning experiences, including science process skills. The courses are specially designed to plan and implement the following objectives:

- To enable students to investigate and discover scientific concepts.
- To modify, rectify and enhance students' investigative abilities.
- To evaluate student performance.
- To diagnose students' weaknesses.
- To develop healthy teacher and student relationship

The courses are tailored to assist a teacher in conducting an activity–centered program where observation and experimentation are stressed. An activity–oriented approach gives

students the opportunity to investigate and discover scientific concepts. Thus students shall be able to modify, rectify and enhance their investigative abilities.

The core values of the department are:

- Merit
- Honesty and character building
- Value Addition
- Hard work
- Care
- Respect
- Commitment
- Accountability
- Fairness
- Transparency
- Trust
- Team spirit

Teaching Methodology:

The courses are taught through a combination of various methods including lectures, practical, seminars, assignment, quiz/presentations, workshops, tutorials and group discussions using audio-visual aids. The teachers discuss the basic theme of the concerned topics subsequently guiding students to collect, recognize and interpret the additional information through other sources like library and internet etc. This creates originality amongst students learning skills enabling them to work with seriousness of purpose.

Quality Policy of Department of Botany:

We yearn to achieve excellence through provision of quality in basic subject of plant sciences and to develop professionals/research scholars to handle multifarious challenge of relevant science. To achieve this commitment we continually improve the effectiveness of our quality management system through human resource development and active faculty/student participation.

Successful completion of the courses ultimately leads to the production of plant specialists with better understanding, deeper analysis and broader vision of the subject, enabled to compete on regional, national, and international levels in research, academics, industry etc and to contribute contributing positively towards the enhancement of scientific knowledge in society.

To achieve this commitment we continually improve the effectiveness of our quality management system through human resource development and active faculty/ student's participation.

Standard 1.1: The programs must have documented measurable objectives that support Faculty / College and institution's mission statements.

Name of Programs	**Duration**	**No. of Modules**	**Total Credit Hrs**
BS Botany	4 years degree program	8 semesters	136

1.1 Program's Objectives

1.1.1 BS Botany (4 years degree Program)

This degree is based on the approved curriculum of Board of Studies Botany, Board of Advance Studies Board of Faculty, and Research and Academic Council of Studies. In the first and second years, the students learn the compulsory courses, foundation courses of Botany and general courses to be chosen from other departments (Statistics, Computer Science, Geography and Psychology). These courses are then followed by breadth courses of Botany. In the final years the students study the advanced courses and are offered research/ internships/ projects. The students work in different laboratories where they perform experiments. In LCWU we are trying to provide students with adequate knowledge in this field with special emphasis on its academic and practical applications.

1.1.1.1 BS Botany Program Objectives

1) To provide female students an independent atmosphere to excel in academic field.

2) To provide students with the abilities, attitudes and skills they need to become effective employees in a rapidly changing environment.
3) To produce graduates with the ability to evaluate and solve complex scientific and non-scientific problems.
4) To provide students with the skills necessary for continued further formal education.
5) To produce knowledgeable graduates who expected standards of ethical and professional conduct.

1.1.1.2 Strategies

Strategies are based on:

1) Designing the program as per requirements of the students and their potential.
2) Curriculum development based on the design of the program.
3) Regular revision of curricula/ programs to keep them in line with the national and international developments.
4) Providing resources including class room facilities, multimedia, computers, and well equipped laboratories.
5) Employing qualified and experienced teachers and to update their knowledge through training.
6) Establish linkages with other universities at National and International level as well as with forestry, agriculture, horticulture, floriculture.
7) Establishing liaison with industry and services that are the potential employers and provide economical consultancy services in the field of specialty to industry and services.
8) Developing moral and ethical basis of the students to impart concept of team work, honesty and discipline through lectures, seminars, industrial and field visits.
    i) Developing close interaction of the teachers with the students through extracurricular activities, social programs, sports and field trips.
    ii) Educating, training and motivating faculty members.
    iii) Establishing quality management system in line with the guidelines of ISO 9001:2000 and HEC.
    iv) Fulfilling yearly quality objectives.

1.1.2 Assessment of Educational Objectives of each Program:

The educational objectives of BS Botany (4 year degree program) are regularly assessed.

1.2Assessment of Educational Objectives of each Program:

1 Table 1 BS Botany (4 year degree program) program objective assessment.

Objectives	**How Measured**	**When Measured**	**Improvements Identified (Based on outcome Examination)**	**Improvements Made**
As given in Para 1.1.1.1	Regular assessment of student knowledge and ability to exhibit the skill by the teacher:		Regularity of attendees required Work based teaching Improving language skill especially in English Course / curriculum revision to enhance outcomes and make it more work based Enhancing communication skills Guidance to student	Attendance rules applied more strictly Teachers training and development Student encouraged to join language courses Course / curriculum revised 5)Students encouraged to attend the National and International workshops /Seminars /Conference
	Class tests	2 class tests		
	Class exercises relating to problem	2 assignments + 2 presentations/quiz per semester		
	Presentation of relevant topic	twice in a semester.		
	Written examination	Twice during each semester		
	Practical assignment in each course	Once in a semester		
	Practical (under graduate course)	Once in a week		

	Research final semester pertaining to practical problem	Once during program		
	Teaching/Learning Process Survey (teachers' evaluation by the student)	Once in a semester	Shortcomings as per survey identified	Teachers are intimated the survey report who make effort to improve which is monitored by next survey
	Faculty Survey Form	Once in a semester	More time to be spent on the following during teaching: Work based scenarios Case studies Presentation by students Revision of program Personal development topic like ethic, moral & code of conduct No of Project win Improvement in quality Project Administrative support Library	All the improvements identified have been implemented
	Suggestion received from students through suggestion box	As and when received	Personal problems of students Issuance of Library Books for a fortnight only	Complaints are addressed immediately
	Students / Quality Assurance Advisor liaison			
	New Introductions			
	Employer Surveys:	Whenever possible		-
	Survey of Graduating Students:	Once a year, on convocation day		-
	Latest Research Student Progress Review	Once a month or as per requirement	Assistance from research institute / industry	Liaison established with Agriculture/Forest

	Survey of Department offering Ph.D.	Every six month	-	-
	Faculty Resume	Once a year	Qualification Training	Sent for higher studies Internal and external training arranged

Standard 1.2: The program must have documented outcomes for graduating students. It must be demonstrated that the outcomes support the program objectives and that graduating students are capable of performing these outcomes.

1.2 Programs Outcomes

1.2.1 BS Botany (4 year Degree) Program Outcomes

1) An ability to apply knowledge of Computer Sciences, Zoology, Chemistry and Statistics to design the research work.
2) An ability to conduct experiments, and to analyze and interpret results critically.
3) An understanding of ethical and professional responsibility.
4) An appreciation of the need for life-long learning and the ability and desire to engage in such learning
5) An ability to work effectively in teams.
6) An ability to communicate effectively.
7) An understanding of the LCW University objectives of female empowerment, competence and integrity
8) Have a commitment to quality, timeliness, and continuous improvement.
9) An ability to do work in field.
10) Trained to face the challenges and threats of life.

Table 2: Outcomes versus Objectives

Program Objectives	Program Outcomes									
	1	2	3	4	5	6	7	8	9	10
1	◊	◊	◊	*	*	◊	◊	◊	*	*
2	◊	◊	◊	*	*	◊	◊	◊	*	*

3	◊	◊	◊	*	*	◊	◊	◊	*	*
4	◊	◊	◊	*	*	◊	◊	◊	*	*
5	◊	◊	◊	*	*	◊	◊	◊	*	*

Legend: ***** Denotes **Substantial** Contribution to the objectives

◊ Denotes **Moderate** Contribution to the objectives

_ Denotes **No** Contribution to the objectives

- Describe the means for assessing the extent to which graduates are performing the stated program outcomes/learning objectives.

The graduates are assessed about the programme outcomes/learning objectives through outcome examination at departmental level. Outcome examination is comprised of:

i) Theoretical papers,
ii) Assignments,
iii) Presentations/quiz,
iv) Practical examination including viva voce
v) Research thesis seminar
vi) Research thesis evaluation by external examiners

Standard 1.3: The results of program's assessment and the extent to which they are used to improve the program must be documented.

1.3.1 Actions taken on the basis of assessment

1) Syllabus revision
2) Teachers training
3) Labs development
4) Faculty development

1.3.2 Strengths of Institute

1) Teamwork
2) Infrastructure
3) Work Environment
4) Library, Computing and Internet facilities

1.3.3 Weaknesses of Institute

Weaknesses of Department

1) Strengthening and developing of Labs required
2) Limited annual departmental budget allocation
3) There is no secretarial staff
4) There is no lab technician in the department
5) No store keeper

1.3.4 Future Plans

1. To strengthen the Prem Madan Herbarium.
2. To strengthen the Botanical Garden
3. MoU will be signed with related Organizations

1.3.5 Training of Faculty

1) Teacher's Training/ Refresher Courses
2) For new teachers Teacher Training Course through NAHE (National Academy of Higher Education) (HEC Funded scheme).

1.3.6 Aspects covered

- General aspects (Lecture preparation/delivery)
- Use of support systems
- Lecture breakdown; conducting quizzes, papers
- Code of conduct; integrity; dress code

- Education psychology
- Communication skills

3) New/young teachers training by senior teachers.
4) Teaching and Lab Staff training on equipment.
5) Publication of Papers
6) Research Work
7) Research projects

1.3.7 Faculty Development and Career Planning

1) Two faculty members of Department are running project successfully with HEC and one with PARB.
2) One Project was successfully completed by one Faculty member funded by HEC.
3) One faculty member completed her Post doc from Cornell University, USA.
4) Two faculty members attend 10 credit hours training.
5) Four faculty members received 10 hours workshop "Patent Claims and Drafting techniques" Conducted by Ms. Shakra Khurshid in May-Oct, 2017, Organized by faculty development Centre, Lahore College for Women University, Lahore
6) Four faculty members availing HEC Indigenous Scholarship for PhD.
7) Faculty members participated "Biosciences 2018" organized by "Pakistan Biological Society" at GCU Lahore from 9-11 may **2018.**
8) One faculty member presented "invited lecture" at 1st international conference held at University of Gujrat, Gujrat.
9) One faculty member won elections for the post of Vice president (Punjab) of Pakistan Botanical Society for the year 2018-2019.
10) TWAS UNESCO associate ship for south China botanical garden for the period of three years

1.3.8 SALARIES AND BENEFITS

1) Government scales for regular University faculty (BS – 18 for Lecturer; BS – 19 for Asstt. Prof.; BS – 20 for Associate Prof. and BS – 21 for Professor with other benefits)

2) Government scales for regular Government of Punjab Employees (BS – 17 for Lecturer; BS – 18 for Asstt. Prof.; BS – 19 for Associate Prof. and BS – 20 for Professor with other benefits)
3) Market rates (visiting faculty) depends upon their Basic Pay Scale depending upon the qualification/experience of the individual. The duration of lecture is 60 minutes.
4) Tenure Track (HEC criteria followed).

Standard 1.4: The department must assess its overall performance periodically using quantifiable measures.

1.4.1 Performance Measures

The Department assesses the overall performance using quantifiable measures.

1.4.1.1 Research Areas

The faculty is involved in research in the following areas:

1	Molecular Genetics
2	Biotechnology
3	Environmental Biotechnology
	Plant Tissue Culture
4	Phytochemistry
5	Industrial Biotechnology
6	Food Engineering
7	Enzymology
8	Molecular Taxonomy
9	Plant Taxonomy
10	Plant Physiology
11	Stress Physiology
12	Fungal Biotechnology
13	Nanobiotechnology

14	Biochemistry
15	Molecular Mycology
16	Plant Fungal Interactions
17	Molecular Plant Virology
18	Plant Biotechnology
19	Biodiversity

1.4.1.2 Collaborations

The Collaborations are developed for research purpose:

1) Government College University Lahore
2) Lahore Medical College Lahore
3) Government College University Faisalabad
4) Institute of Agricultural sciences, University of Punjab Lahore, Pakistan
5) National Rice Institute of China, China
6) Vegetable Research institute, Ayub Agriculture Research Centre, Faisalabad
7) Noor Fatima Textile industry, Faisalabad, Pakistan.
8) University of Agriculture Faisalabad
9) PCSIR
10) University of Lahore

1.4.1 Performance Measures:

T**able 3: No. of Students Enrolled**

Program	**Session**	**No. of Students**
BS	2017-2021	49
	2018-2022	56

Table 4: Student-Faculty Ratio (BS Programme)

Year	No. of Students	No. of Faculty Members	Student-Faculty ratio
2017-2018	165	17	10/1
2018-2019	162	18	9/1

Table 4b : Student-Faculty Ratio (BS, MS & PhD Programmes)

Year	No. of Students	No. of Faculty Members	Student-Faculty ratio
2018	47+162+45= 257	18	14:1
2017	51+165+40= 256	17	14:1

Table 5: No. of Students Passed Out

Program	Passing out Year	No. of Students
BS	2017	47
	2018	43+1

Table 6: Percentage of Honor Students & Attrition Rate

Year	%age of Honor Students **Criteria:** CGPA 3.7 and above	Attrition Rate $\frac{\text{(Admitted –pass out) *100}}{\text{Admitted}}$
2017	08	50-47/50 X 100=6
2018	18	44-44/44x 100= 0

Table 7: Faculty Training, Seminars and workshops (Appendix A)

Year	No. Of Trainings, Seminars and workshops
2017	2
2018	0

Table 8: Number of Publications (Appendix B)

Year	Papers published
2017	42
2018	49

1.4.1.3 Books in Library

Total Books in Science Library: 11292

Botany Books: 473

1.4.1.5 Departmental Achievements (others)

Annexure Attached

1.4.1.6 Honors and Awards

Annexure Attached

CRITERION 2: CURRICULUM DESIGN AND ORGANIZATION

➡ The development of curriculums of Botany is based on the detailed curriculum development guidelines issued by HEC.

1 PROGRAM BS Botany (4Year Degree Program)

Curriculum Course Requirements – B.S. CS

Note: Definition of credit hours = 1 credit hour is equivalent to 16 teaching hours.

Total Credit hours: 136

Structure of Scheme of study:

Sr. No	Categories	No. of Courses	Credit Hours
1.	Compulsory Courses (No Choice)	06	13
2.	General Courses (To be chosen from other Department)	06	24
3.	Basic Courses/Foundation	04	16
4.	Major Courses (Including Research/Project/Internship)	21	75
5.	Electives within the major	02	08
	Total	**39**	**136**

YEAR-1

SEMESTER-I

Course No	Course Title	Credit Hours
CC/Eng-101	Language in Use	3(3+0)
CC/Isl-101 CC/Phil-101	Islamic Education/Ethics	2(2+0)
Maj/Bot-101	Plants Systematics,Anatomy and Development	4(3+1)
Min/Zoo-101	Invertebrate Diversity	4(3+1)

Min/Chem-101	General Inorganic Chemistry	4(3+1)
	Total Credits	**17**

SEMESTER-II

Course No	**Course Title**	**Credit Hours**
CC/Eng -102	Academic Reading & Writing	3(3+0)
CC/PS-101	Pakistan Studies	2(2+0)
Maj /Bot -102	Diversity of Plants	4(3+1)
Min/Zoo-102	Vertebrate Diversity	4(3+1)
Min/Chem-102	Physico-Organic Chemistry-I	4(3+1)
	Total Credits	**17**

YEAR-2

SEMESTER-III

Course No	**Course Title**	**Credit Hours**
CC/Eng -201	Communication Skills	3 (3+0)
EC/Stat-201	Basic Statistics	2 (2+0)
Maj/Bot -201	Cell Biology, Genetics & Evolution	4(3+1)
Maj/Bot -202	Plant Physiology & Ecology	4(3+1)

Min/Zoo-201/ Min/Chem 201	Animal Form & Function/ Physico-Organic Chemistry-II	4(3+1)
	Total Credits	**17**

SEMESTER-IV

Course No	Course Title	Credit Hours
CC/Eng- 202	Advanced Academic Reading & Writing	3(3+0)
EC/CS-201	Introduction to Computer	3(2+1)
Maj/Bot -203	Microbiology	4(3+1)
Maj/Bot -204	Biodiversity and Conservation	4(3+1)
Min/Stat-201	Inferential Statistics	4(3+1)
	Total Credits	**18**

YEAR-3

SEMESTER-V

Course No	Course Title	Credit Hours
Maj/Bot -301	Phycology and Bryology	4(3+1)
Maj/Bot -302	Mycology and Plant Pathology	4(3+1)
Maj/Bot -303	Diversity of Vascular Plants	4(3+1)
Maj/Bot -304	Plant Systematics	4(3+1)
Maj/Bot -305	Plant Biochemistry	3(2+1)
	Total Credits	**19**

SEMESTER-VI

Course No	Course Title	Credit Hours
Maj/Bot -306	Plant Anatomy	4(3+1)
Maj/Bot -307	Plant Metabolism	3(2+1)
Maj/Bot -308	Classical Genetics	3(2+1)
Maj/Bot -309	Plant Physiology	3(2+1)
Maj/Bot -310	Plant Ecology	3(2+1)
	Total Credits	**16**

YEAR-4

SEMESTER-VII

Course No	Course Title	Credit Hours
Maj/Bot -401	Molecular Genetics	3(2+1)
Maj/Bot -402	Plant Hormones and Photomorphogenesis	3(2+1)
Maj/Bot -403	Community Ecology	3(2+1)
Maj/Bot -404	Research Methodology	2(2+0)
Maj/Bot -40*	Opted from Annexure –A	4(3+1)
	Total Credits	**15**

SEMESTER-VIII

Course No	Course Title	Credit Hours
Maj/Bot -406	Environmental Biology	4(3+1)
Maj/Bot -407	Molecular Biology	3(2+1)
Maj/Bot -40*	Opted from Annexure –A	4(3+1)
Res/Bot -401**	Research Thesis	6
	Total Credits	**17**

Total Credit Hours: 17+17+17+18+19+16+15+17=136CR

***The course will be selected by the students from Annexure-A on the availability of faculty member expertise and number of students.**

**** Research will be offered in 7th Semester.**

Standard 2.1: The curriculum must be consistent and supports the program's documented objectives.

Table 9: Courses versus Program Outcomes

1) BS Botany (4-Year degree program) contents/courses meet the program objectives as shown in the table.

Courses	Program Objectives				
	1	**2**	**3**	**4**	**5**
CC/Eng-101	√	√	√	√	√
CC/Isl-101	√	√	√	√	√
Maj/Bot-101	√	√	√	√	√
Min/Zoo-101	√	√	√	√	√
Min/Chem-101	√	√	√	√	√
CC/Eng -102	√	√	√	√	√
CC/PS-101	√	√	√	√	√
Maj/Bot-102	√	√	√	√	√
Min/Zoo-102	√	√	√	√	√

Min/Chem-102	√	√	√	√	√
CC/Eng -201	√	√	√	√	√
CC/Stat-201	√	√	√	√	√
Maj/Bot-201	√	√	√	√	√
Maj/Bot-202	√	√	√	√	√
Min/Zoo-201/ Min/Chem 201	√	√	√	√	√
CC/Eng- 202	√	√	√	√	√
CC/CS-201	√	√	√	√	√
Maj/Bot-203	√	√	√	√	√
Maj/Bot-204	√	√	√	√	√
EC/Geo-202 / EC/ St-201	√	√	√	√	√
Maj/Bot-301	√	√	√	√	√
Maj/Bot-302	√	√	√	√	√
Maj/Bot-303	√	√	√	√	√
Maj/Bot-304	√	√	√	√	√
Maj/Bot-305	√	√	√	√	√
Maj/Bot-306	√	√	√	√	√
Maj/Bot-307	√	√	√	√	√
Maj/Bot-308	√	√	√	√	√
Maj/Bot-309	√	√	√	√	√

Maj/Bot-310	√	√	√	√	√
Maj/Bot-401	√	√	√	√	√
Maj/Bot-402	√	√	√	√	√
Maj/Bot-403	√	√	√	√	√
Maj/Bot-404	√	√	√	√	√
Maj/Bot-405	√	√	√	√	√
Maj/Bot-406	√	√	√	√	√
Maj/Bot-407	√	√	√	√	√
Maj/Bot-40*	√	√	√	√	√
Res/Bot-40**	√	√	√	√	√

Standard 2.2: Theoretical background, problems analysis and solution design must be stressed within the program's core material.

- **Program:** BS Botany (4Year Degree)

The courses of BS program adequately address:

I. Foundation and basic background
II. Theoretical background Problem analysis
III. Research design

Table 10: **Elements of Courses**

Elements	**Courses**
Theoretical background	CC/Eng-101, CC/Isl-101, Maj/Bot-101, Min/Zoo-101, Min/Chem-101, CC/Eng -102, CC/PS-101, Maj/Bot-102,

	Min/Zoo-102, Min/Chem-102,, CC/Eng -201, CC/Stat-201, Maj/Bot-201, Maj/Bot-202, Min/Zoo-201/ Min/Chem-201, CC/Eng- 202, CC/CS-201, Maj/Bot-203, Maj/Bot-204, EC/Geo-202 / EC/ St-201
Problem analysis	Maj/Bot-301, Maj/Bot-302, Maj/Bot-303, Maj/Bot-304, Maj/Bot-305, Maj/Bot-306, Maj/Bot-307, Maj/Bot-308, Maj/Bot-309, Maj/Bot-310
Research design	Maj/Bot-401, Maj/Bot-402, Maj/Bot-403, Maj/Bot-404, Maj/Bot-405, Maj/Bot-406, Maj/Bot-407, Maj/Bot-40* Res/Bot-40**

Standard 2.3: The curriculum must satisfy the core requirements for the program, as specified by the respective accreditation body.

- The curriculum satisfies both the core requirements of credit hours and criteria of admission laid down by Lahore College for Women University and HEC and is in par with the international standards.

Standard 2.4: The curriculum must satisfy the major requirements for the program as specified by the respective accreditation body.

- The curriculum satisfies major requirements of the program. The programs and curriculum has the approval of Board of Studies of Botany, Board of Faculty, Board of Advanced Studies and Research and Academic Council.

Standard 2.5: The curriculum must satisfy general education, arts, and professional and other discipline requirements for the program, as specified by the respective accreditation body/council.

- The curriculum satisfies general education disciplines requirements. No formal accreditation with any professional body but it fulfills all the necessary/basic requirements of the accreditation body. The programs and curriculum has the approval of Board of Studies of Botany, Board of Faculty, Board of Advanced Studies and Research and Academic Council of Lahore College for Women University.
- The basic Botany and natural science components are present in the program.

Standard 2.6: Information technology component of the curriculum must be integrated throughout the program.

- Information technology component of the curriculum is integrated throughout the program according to the approved scheme of studies.

Standard 2.7: Oral and written communication skills of the student must be developed and applied in the program.

- Three Compulsory English courses specifically focus on this aspect and class participation involves the individual student presentations in each course. Furthermore for improving Oral and written communication skills students are encouraged to participate in seminars, conferences and workshops.

CRITERION 3: LABORATORIES AND COMPUTING FACILITIES

Location of labs: Department of Botany, post Graduate Block, LCWUL

Safety rules: Safety rules are displayed in the labs

Software available: All statistical and research relevant soft wares are provided to the student in the laboratory

Courses Taught: All the special courses offered by faculty are taught in the respective research laboratories

Research Areas:

1	Molecular Genetics
2	Biotechnology
3	Environmental Biotechnology
4	Plant Tissue Culture

5	Phytochemistry
5	Industrial Biotechnology
6	Food Engineering
7	Enzymology
8	Molecular Taxonomy
9	Plant Taxonomy
10	Plant Physiology
11	Stress Physiology
12	Fungal Biotechnology
13	Nanobiotechnology
14	Biochemistry
15	Molecular Mycology
16	Plant Fungal Interactions
17	Molecular Plant Virology
18	Plant Biotechnology
19	Biodiversity

Laboratory Title	**Objectives**	**Major Equipment**	
Molecular Genetics and Biotechnology Lab	Students are equipped with Molecular Genetics and plant biotechnology techniques	PCR Machine Autoclave Centrifuge machine Fluorescence microscope Hot air oven Drying oven Shaker Hot plate Incubator Vertical and Horizontal Mini gel electrophoresis	Oven pH meter Refrigerator Spectrophotometer UV Transilluminator Vortex mixer Weighing balance

		Culture Room	
Phytochemistry Lab	Students are equipped with Phytochemistry techniques	Chiller Colony counter Compound microscopes EC meter Growth chamber Hot air over (Bench top) Incubator Laminar air flow chamber Lux meter Micropipettes pH meter Printer Refrigerator	Rotary Evaporator Soxhlet apparatus Stereo binocular microscope Student microscopes Thin Layer Chromatography Apparatus Vacuum pump Water bath Water distillation plant Weighing balance
Mycology and Industrial Biotechnology Lab	Students are equipped with Mycology and Industrial Biotechnology techniques	Colony counter Electric stirrer Magnetic stirrer Digital balance Vortex mixer Laminar air flow cabinet	Autoclave Shaking incubator Refrigerator Fermenter Oven Microscopes
Molecular Taxonomy Lab	Students are equipped with Molecular Taxonomy techniques	Microtomes Water bath Weighing balance pH meter Shaker Magnetic stirrer Oven	Soxhlet apparatus Gel electrophoresis unit Microscopes Laminar air flow cabinet

		Distillation unit	PCR machine Centrifuge machine UV transilluninator
Plant Physiology and Fungal Biotechnology Lab	Students are equipped with Plant Physiology and Fungal Biotechnology techniques	Drying oven Weighing balance Centrifuge machine Osmometer Laminar air flow cabinet Microwave Microscope	Water bath Autoclave Water distillation unit Conductivity meter Magnetic stirrer IRGA Refrigerator
Plant Taxonomy Lab	Students are equipped with Plant Taxonomy techniques	Weighing balance Sledge microtome Rotary microtome Microscopes Water bath Hot plate	Autoclave Soxhlet apparatus Incubator Desiccator UV Lamp
Tissue Culture and Biochemistry Lab	Students are equipped with Tissue Culture and Biochemistry techniques	Microwave Weighing balance Light Microscope	Laminar air flow cabinet Soxhlet apparatus Microwave assisted extractor Fridge

- The BS Botany Program has been provided with adequate laboratory facilities. Fire extinguishers and safety equipment have been made available to fulfill the safety regulations. Instructions to the students are available with the Faculty member and Lab Supervisors before, they are made accessible to the students.

Standard 3.1: Manuals/documentation/instructions for experiments must be available and readily accessible to faculty and students.

- The BS Botany Program has been provided with basic laboratory facilities Manuals/documentations are available in library can be accessible at any time. Overall resources are less as compared to the similar departments in reputable institutions
- Fire extinguishers and safety equipment have been made available to fulfill the safety regulations. Instructions to the students are available with the Faculty member and Lab Supervisors before, they are made accessible to the students.
-

Standard 3.2: There must be adequate support personnel for instruction and maintaining the laboratories:

Two lab assistants are available in the department to facilitate the practical and research activities. Laboratory assistants are available to issue the glassware and chemicals to the research students from the departmental store. Furthermore four lab attendants are available to facilitate laboratory experimentation with instructors. Further the experiment instructions to the research and class students are given by the respective teachers.

Standard 3.3: The university computing infrastructure and facilities must be adequate to support program's objectives:

As per programme objectives there is no separate computing facility required. Although core research soft wares are available on university website for facilitating the researchers. Further Botany and Zoology departments are sharing a common computer laboratory.

CRITERION 4: STUDENT SUPPORT AND ADVISING

Standard 4.1: Courses must be offered with sufficient frequency and number for students to complete the program in a timely manner:

- The strategy for programs (courses) offering is controlled. All courses of Botany are offered once a year.

Standard 4.2: Courses in the major area of study must be structured to ensure effective interaction between students, faculty and teaching assistants:

- The effective student/faculty interaction in programs taught by more than one faculty members is streamlined by coordination of these faculty members and the commonality is maintained through any curriculum which is adopted for the particular course.
- The programs are structured to ensure effective interaction between students, faculty and the HOD. The students which require extra help are provided services through tutorials, questions and answers. Questions are encouraged by the faculty from the students. Seminars are arranged where the students are free to discuss the topics relating to the program. Debates are initiated. The students are free to interact with the HOD in case of any shortcoming.

Standard 4.3: Guidance on how to complete the program must be available to all students and access to academic advising must be available to make course decisions and career choices:

- The students are provided guidance regarding the completion of the programs and having access to qualified faculty as well as student counseling. The students are encouraged to bring forward their suggestions and complaints through a complaint box which is maintained in the Institute. The students once in semester carry-out the teacher's evaluation.
- The counseling of the students are done in the following way:

University has its own student counseling centre where qualified staff provides assistance to students regarding jobs, personal problems and issues related to studies and university administration. Any student requiring help can easily access the student counseling centre.

CRITERION 5: PROCESS CONTROL

Standard 5.1: The process by which students are admitted to the program must be based on quantitative and qualitative criteria and clearly documented. This process must be periodically evaluated to ensure that it is meeting its objectives:

BS Botany (4 Year Degree Program)

This is a 4 year degree program with minimum 136 credit hours. The program is divided in 8 semesters with 2 semesters each year.

Eligibility Criteria:

- Matric / O level (with science) : 60%
- F.Sc/ A level (pre-medical) : 60%

Standard 5.2: The process by which students are registered in the program and monitoring of students' progress to ensure timely completion of the program must be documented. This process must be periodically evaluated to ensure that it is meeting its objectives:

- Advertisements are made in leading newspapers and on Lahore College for Women University website. Students are admitted on the basis of merit. Merit lists are displayed and after submission of dues and checking original documents students are admitted. The student academic progress is monitored regularly by the Course Leader and regular written examination system. The process of registration and monitoring are reviewed once in a year three months before the date of admission by University Admission Committee.

Standard 5.3: The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation, promotion must be consistent with institution mission statement. These processes must be periodically evaluated to ensure that it is meeting its objectives:

- The standards are clearly indicated in the University Calendar which are followed. Qualifications which are required for each course are kept in mind. The criteria for recruiting are, qualification, experience which are judged through analysis of CVs and personal

interviews. In case of permanent faculty members, the recruiting is done by a selection board constituted by Lahore College for Women University whereas; visiting faculty members are recruited by a board constituted by the Institute. The input of the students for maintaining the quality of the teachers is done by evaluating the teachers regularly once in a semester by the students. The results of these studies are sent to the teachers who are asked to improve and in extreme cases, replacements are made.

- An Annual Confidential Report (ACR) /Annual performance Reports is initiated by the Dean annually for each member of staff and retention of the staff, their increment and promotion are based on these reports.
- The faculty members performing well are rewarded by increment and honorariums. Good working conditions provided job satisfaction, pays, providing facilities like Ph.D. programs and scholarships are incentive to faculty member who perform well.

Standard 5.4: The process and procedures used to ensure that teaching and delivery of course material to the students emphasizes active learning and that course learning outcomes are met. The process must be periodically evaluated to ensure that it is meeting its objectives:

- In order to ensure that graduates / outgoing students have completed the requirement of the programs are based on standards.
- The semester rules have been adopted by Botany Department and QEC and the Head of Department ensure their compliance.
- The operation is reviewed once a year and is documented as Management of Academic Programs.

Standard 5.5: The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.

- In order to ensure that graduates / outgoing students have completed the requirement of the programs are based on standards.

- The semester rules have been adopted by Botany Department and QEC and the Head of Department ensure their compliance.
- The operation is reviewed once a year and is documented as Management of Academic Programs.

CRITERION 6: FACULTY

Standard 6.1: There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas/courses with continuity and stability. The interests and qualifications of all faculty members must be sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline. The majority of the faculty must hold a Ph.D. in the discipline:

- There is adequate full time faculty supplemented by visiting faculty which provides adequate coverage of the program with continuity and stability. The interest and the qualifications of all faculty members are pre-judged and monitored for each module forming a part of the program. The level of competency of the faculty members are evaluated at time of induction and monitored during teaching.

Table 11: Faculty Distribution by Program Areas

Program areas	**Module in area and semester per year**	**Number of faculty members in each area**	**Number of faculty with Ph.D. degree**
Area 1. BS Botany (4 Year Degree Program)	2 Semesters per year	18	15
Total		**18**	**15**

Standard 6.2: All faculty members must remain current in the discipline and sufficient time must be provided for scholarly activities and professional development. Also, effective programs for faculty development must be in place:

•All the faculty members remain current in the disciplines and sufficient time is provided for scholarly activities and professional development. Effective program for faculty development is in place. The incoming faculty is given one month to familiarize with the working of the Institute. During this time they are monitored. They are provided centralized training by Registrar's office through NAHE faculty development program of HEC. They are encouraged to attend international seminars. Some of the faculty members go to foreign countries through fellowships.

Standard 6.3: All faculty members should be motivated and have job satisfaction to excel in their profession:

Faculty members are awarded research incentives and appreciation letters in order to motivate them in professional life. This contribute towards job satisfaction for faculty and staff.

CRITERION 7: INSTITUTIONAL FACILITIES

Standard 7.1: The institution must have the infrastructure to support new trends in learning such as e-learning

1) Academic Building: (Dedicated/Owned)

i.	Class rooms:	05
ii.	General Labs:	02
iii.	Research Labs:	07
iv.	Seminar Room:	01
v.	Committee Room:	01
vi.	Library	01
vii.	HOD Office	01
viii.	Main Staff Room	01

2) Botanical Garden (main campus) 01

3) Video conferencing room --

4) Convocation Hall (capacity: 1300) --

5) Meeting / conference rooms Seminar room (Student Service Centre)

6) Student Hostels

7) Visiting Faculty Hostel

8) Sports Facilities:

a) Gymnasium

b) Play ground

c) Table Tennis

9) Transport

a) Busses

b) Coasters

c) Vans

d) Ambulance

e) Cars

f) Tractor/trolly

10) Health Centre

11) Day care centre (to accommodate children of Faculty, Staff and Students)

12) Masjid

13) Student Counseling Centre

14) Placement Bureau

15) Cafeteria

16) Fruit/juice shop

17) Book Shop

Standard 7.2: The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel:

- Main Library

- Science Library
- Departmental Library
    - No. of Hardcopy Books:11292 (science library)
    - Core Botany Books: 473 (Science library)
        - Digital Library (Through HEC)
        - Access to E - Books
        - Journals: Access to ACM, IEEE, Science direct, Springer Link etc. through HEC.
        - Book Bank: Exists (works under Student Service Centre)
        - Library Equipment
        - Computers
        - Scanner
        - Photocopier
        - Printer
        - Timings: 8:00 A.M. to 6:00 P.M.

The students can avail the library facility from 8 am to 6pm. There is annual addition to the existing stock. There is regular newspaper available in the library.

Standard 7.3: Class-rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities:

All Class-rooms and Labs are adequately equipped so that faculty members can carry out their responsibilities. There is no separate staff offices in the department. A common staff room facility is provided to all staff members. The staff members are allocated the research labs for sitting and looking after the research matters.

CRITERION8: INSTITUTIONAL SUPPORT

Standard 8.1: There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teachers and scholars:

- High quality faculty can be appointed by following the terms and conditions established by Higher Education Commission Pakistan.

- Teachers are recruited on the basis of criterion established by the University.
- Existing faculty is sent to different courses of teaching, organized by university to update the knowledge.
- Secretarial support is not adequate. Although office equipment is available for printing purposes etc

Standard 8.2: There must be an adequate number of high quality graduate students, research assistants and Ph.D. students:

There is an adequate number of graduate and PhD students, while research assistants in the departments are only hired under some sponsored projects.

Program	**2016**	**2017**	**2018**
Graduate Students	23	26	23
Research assistants	1	-	1
Ph.D students	34	40	45

Standard 8.3: Financial resources must be provided to acquire and maintain Library holdings, laboratories and computing facilities:

Annual grant is provided by university

- **Budget for Laboratories**
  - **Amount spent from 2017 – 2018:**

University own source 0.5 million (MS+BS)

There are no special financial resources provided directly to the department for library and computing facility.