

Institute of Biological Sciences

VISION

The institute is the integrative force at national and international level that will catalyze innovation at the interface between Biotechnology, Microbiology, Botany, and other applied sciences; and to achieve excellence as a teaching and research institute in various fields to produce highly skilled professionals and researchers catering to challenging national needs.

MISSION

To provide pedagogy embracing speculative and heuristic abilities of its graduates to produce skilled human resource in the fields of Biotechnology, Microbiology, and Botany. To prepare the graduates for the new paradigms of interdisciplinary research and development; the institute is open to external collaborations. To achieve excellence in education and research, so that the graduates may play a significant role in the social and economic development of the country.

PROGRAMS OFFERED:

Associate Degree in Biotechnology

Bachelor of Science in Biotechnology

Master of Science in Biotechnology

Associate Degree in Microbiology

Bachelor of Science in Microbiology

Master of Science in Microbiology

Associate Degree in Botany

Bachelor of Science in Botany

Master of Science in Botany

Faculty Members, Institute of Biological Sciences

Prof. Dr. Farrukh Hussain

Director

Post Doct, Colorado State Uni, USA, Ph.D (Botany), University of Pesh

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Ph.D (Biological Sciences), Korea Advanced Ins of Sci & Tech (KAIST, Daejeon, Korea)

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Ph.D (Biotechnology), Quaid-i-Azam University Islamabad

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Ph.D (Biotechnology), University of Malakand,

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Ph.D (Biotechnology), University of Peshawar.

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Assistant Professor

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Ms. Fareesa Khan

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Lecturer (on Leave)

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Ms. Samya Nisar

Lecturer

MA English

Associate Degree in Biotechnology

Program Code	100
Number Of Courses	24
Credit Hours	69
Minimum Duration	4 Semesters, 2 Years
Maximum Duration	10 Semesters, 5 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

F.Sc. (Pre-Medical) or A-Levels with Equivalency Certificate from IBCC Islamabad with at least 45% Marks or an equivalent certificate from a recognized institution, are eligible to apply. Candidates will have to pass an entry test and aptitude interview conducted by the University.

Program Objectives:

The two year program is designed in accordance with the guidelines provided by Higher Education Commission, Islamabad, Pakistan in Biotechnology to provide the students an insight to the nucleic acid manipulation, basic cell techniques with their impacts on the human health and environment for overall improvement of socioeconomic status of individuals at local and national level.

Program Outcomes:

After getting AD in Biotechnology, the students will be able to understand various aspects of biotechnology and their utilization for the welfare of human society. They will have capability to use biotechnological techniques in diagnostic and research activities and solution of biotechnological problems.

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	17
ENG 101	Functional Communication (English – I)	3-0	
GS 123/240	Islamic Studies/Values, Ethics & Society (For Non Muslims)	2-0	
MA 100	Mathematics – I (Pre-Calculus)	3-0	
CH 102	Biochemistry – I	2-1	
MB 100	General Microbiology – I	2-1	
BIO 102	Cell Biology-I	2-1	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	17
ENG 111	Basic Communication Skills (English – II)	3-0	
GS 128	Pakistan Studies	2-0	
MA 110	Mathematics – II (Calculus)	3-0	
CH 110	Biochemistry – II	2-1	
CS 110	Introduction to Computer Science	2-1	
BT 202	Fundamental of Biotechnology	2-1	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
ENG 290	Report Writing (English – III)	3-0	
BT 325	Immunology	2-1	
CH 214	Organic Chemistry-I	2-1	
MB 101	Microbial Biotechnology	3-0	
BT 204	Genetics	2-1	
BIO 201	Radio Biology	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	17
CH 223	Organic Chemistry-II	2-1	
BT 232	Ecosystem	2-1	
BT 315	Animal Biotechnology	2-1	
CH 316	Physical Chemistry	2-1	
BIO 224	Biosafety & Bioethics	2-0	
BIO 311	Molecular Biology-I	2-1	

Bachelor of Science in Biotechnology

Program Code	082
Number Of Courses	45 + Research Project
Credit Hours	138
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	16 Semesters, 8 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

1. F.Sc. (Pre-Medical) or A-Levels with Equivalency Certificate from IBCC Islamabad with at least 45% Marks or equivalent certificate from a recognized institution are eligible to apply.
2. Candidates holding Associate Degree in relevant discipline with at least 2.00 CGPA on the scale of 4.00 from any recognized university/ institution will join from the 5th semester of their degree program. Minimum duration of their degree shall be 2 years.
3. Candidates holding Bachelor degree (14 years of education) with at least 45% marks in annual system or Associate Degree in other than relevant discipline with at least 2.00 CGPA on the scale of 4.00 from any recognized university/ institution will join from the Bridge semester of their Degree program. Minimum duration of their degree shall be 2.5 years.

Candidates need to pass an entry test or an aptitude interview conducted by the University.

Program Objectives:

The four year program is designed in accordance with the guidelines provided by Higher Education Commission, Islamabad, Pakistan for BS Biotechnology to provide the students an insight into the biotechnological approaches in the study of nucleic acid manipulation, basic cell and tissue culture techniques, plant biotechnology and health biotechnology with their impacts on the agriculture, human health and environment for the overall improvement of socioeconomic status of individuals at local and national level.

Program Outcomes:

The graduates will be skilled to understand basic and applied concepts of Biotechnology. They will be able to use biotechnological approaches in solving and improving the quality of life and environment through bio-processing, manipulation at genetic and molecular level, extraction and synthesis of useful products for medical, health and agricultural benefits. The graduates will be skilled to critically analyse the problems and suggest their biotechnological solutions.

*BRIDGE SEMESTER

Course Code	Course Title	Cr. Hrs.
BT 202	Fundamentals of Biotechnology	2-1
BT 315	Animal Biotechnology	2-1
BT 325	Immunology	2-1
BIO 102	Cell Biology-I	2-1
BIO 311	Molecular Biology-I	2-1

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	17
ENG 101	Functional Communication (English – I)	3-0	
GS 123/240	Islamic Studies/Values, Ethics & Society (For Non Muslims)	2-0	
MA 100	Mathematics – I (Pre-Calculus)	3-0	
CH 102	Biochemistry – I	2-1	
MB 100	General Microbiology – I	2-1	
BIO 102	Cell Biology-I	2-1	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
ENG 290	Report Writing (English – III)	3-0	
BT 325	Immunology	2-1	
CH 214	Organic Chemistry - I	2-1	
MB 101	Microbial Biotechnology	3-0	
BT 204	Genetics	2-1	
BIO 201	Radiobiology	2-1	

SEMESTER 5

Course Code	Course Title	Cr. Hrs.	18
MA 303	Statistical Methods	3-0	
BT 331	Plant Physiology	2-1	
BIO 322	Molecular Biology-II	2-1	
BT 317	Principles of Biochemical Engineering	2-1	
BT 332	Analytical Chemistry & Instrumentation	2-1	
GS 333	Environmental Policy	3-0	

SEMESTER 7

Course Code	Course Title	Cr. Hrs.	18
BT 410	Health Biotechnology	2-1	
BT 302	Recombinant DNA Technology	2-1	
BT 418	Proteomics and Genomics	2-1	
BT 355	Environmental Biotechnology	2-1	
BT 414	Oncology	2-1	
RES 491	Research Project (Phase I)	0-3	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	17
ENG 111	Basic Communication Skills (English – II)	3-0	
GS 128	Pakistan Studies	2-0	
MA 110	Mathematics – II (Calculus)	3-0	
CH 110	Biochemistry – II	2-1	
CS 110	Introduction to Computers Science	2-1	
BT 202	Fundamentals of Biotechnology	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	17
CH 223	Organic Chemistry-II	2-1	
BT 232	Ecosystem	2-1	
BT 315	Animal Biotechnology	2-1	
CH 316	Physical Chemistry	2-1	
BIO 224	Biosafety & Bioethics	2-0	
BIO 311	Molecular Biology	2-1	

SEMESTER 6

Course Code	Course Title	Cr. Hrs.	18
BT 334	Genetic Resources & Conservation	2-1	
BT 324	Cell & Tissue Culture	2-1	
BT 322	Plant Biotechnology	2-1	
BT 408	Food Biotechnology	2-1	
RES 380	Research Methodology	3-0	
CS 338	Bioinformatics	2-1	

SEMESTER 8

Course Code	Course Title	Cr. Hrs.	15
BT 427	Nanobiotechnology	2-1	
BT 330	Industrial Biotechnology	2-1	
BT 421	Medical Genetics	2-1	
BT 429	Pharmaceutical Biotechnology	2-1	
RES 492	Research Project (Phase II)	0-3	

Master of Science in Biotechnology

Program Code	157
Number of Courses	22 + Research Project
Credit Hours	72
Minimum Duration	4 Semesters, 2 Years
Maximum Duration	10 Semesters, 5 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

The Candidates must have 14 years of education from recognized university or Degree Awarding institution with B.Sc. Biotechnology or Conventional B.Sc. Hons (3-Years) securing at least 45% marks in annual system with any two of the following subjects: Botany, Zoology, Chemistry, Biochemistry, Biotechnology, Microbiology, Genetics, Physiology, Forestry or related biological subject.

Program Objectives:

The Curriculum designed for the MSc Biotechnology will prepare the graduates to cope up with the issues for wide spectrum of areas including various biotechnologies such as Medical, Dairy, Poultry, Agricultural and industrial technologies. These trained graduates will play a vital role in the economic growth of the country through learning advance concepts of Biotechnology. It will also create awareness about the role of biotechnology in improving socio-economic uplift of the country and make liaison between biotechnologist with society and industry.

Program Outcomes:

Graduates will be capable of understanding the basic and advanced concepts of various aspects of Biotechnology, Bio informatics, Molecular Biology, Cell & Tissue culture, Genetic and Biochemical Engineering. The graduates will be skilled in basic and applied research techniques to independently design and conduct research activity in health, food, agriculture, plant cell and tissue culture and environmental biotechnologies for the socio-economic uplift of the country.

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	18
BT 202	Fundamentals of Biotechnology	2-1	
BT 331	Plant Physiology	2-1	
BIO 322	Molecular Biology-II	2-1	
BT 317	Principles of Biochemical Engineering	2-1	
BT 332	Analytical Chemistry & Instrumentation	2-1	
GS 333	Environmental Policy	3-0	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
BT 410	Health Biotechnology	2-1	
BT 302	Recombinant DNA Technology	2-1	
BT 418	Proteomics and Genomics	2-1	
BT 335	Environmental Biotechnology	2-1	
BT 414	Oncology	2-1	
MA 303	Statistical Methods	3-0	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	18
BT 334	Genetic Resources & Conservation	2-1	
BT 324	Cell & Tissue Culture	2-1	
BT 322	Plant Biotechnology	2-1	
BT 408	Food Biotechnology	2-1	
RES 380	Research Methodology	3-0	
CS 338	Bioinformatics	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	18
BT 427	Nanobiotechnology	2-1	
BT 330	Industrial Biotechnology	2-1	
BT 421	Medical Genetics	2-1	
BT 429	Pharmaceutical Biotechnology	2-1	
RES 480	Research Project	0-6	

NOTE: Students are encouraged to undergo Internship Program and Practical Learning Lab (PLL) (Details are given in Sections 27 & 28 of the Rules and Regulations.

Associate Degree in Microbiology

Program Code	107
Number of Courses	24
Credit Hours	69
Minimum Duration	4 Semesters, 2 Years
Maximum Duration	10 Semesters, 5 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

F.Sc. (Pre-Medical) or A-Levels with Equivalency Certificate from IBCC Islamabad with at least 45% Marks or an equivalent certificate from a recognized institution are eligible to apply. Candidates will have to pass entry test and aptitude interview conducted by the University.

Program Objectives:

The Two year microbiology program is designed in accordance with the guidelines provided by Higher Education Commission, Islamabad, Pakistan to impart the students an insight into the microbial world, their diversity, manipulation and importance in health, agriculture, environment quality for the overall uplift of socio-economic status of community at local and national level.

Program Outcomes:

After successful completion of the Associate Degree the students will have theoretical and practical concepts in basic and applied microbiology. They will be able to identify, isolate, manipulate and culture microbes in the laboratory. The students will gain experience in microbial techniques to be used in analyzing the health and other problems due to microbes.

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	17
ENG 101	Functional Communication (English – I)	3-0	
GS 123/240	Islamic Studies/Values, Ethics & Society	2-0	
MA 100	Mathematics – I (Pre-Calculus)	3-0	
CH 102	Biochemistry – I	2-1	
MB 100	General Microbiology – I	2-1	
BIO 102	Cell Biology-I	2-1	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	17
ENG 111	Basic Communication Skills (English – II)	3-0	
GS 128	Pakistan Studies	2-0	
MA 110	Mathematics – II (Calculus)	3-0	
CH 110	Biochemistry – II	2-1	
CS 110	Introduction to Computers Science	2-1	
MB 101	Microbial Biotechnology	2-1	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
ENG 290	Report Writing (English – III)	3-0	
MB 215	Gen. Immunology	2-1	
MB 212	Gen. Microbiology – II	2-1	
MB 222	Mycology	2-1	
MB 213	Bacterial Genetics	2-1	
MB 220	Human Physiology-I	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	17
MB 204	Bio-Safety and Risk Management	2-0	
BT 336	Immunobiology	2-1	
BIO 212	Cell Biology – II	2-1	
MB 223	General Microbiology – III	2-1	
MB 221	Human Physiology – II	2-1	
MB 207	Clinical Bacteriology	2-1	

Bachelor of Science in Microbiology

Program Code	019
Number of Courses	45 + Research Project
Credit Hours	138
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	16 Semesters, 8 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

1. F.Sc. (Pre-Medical) or A-Levels with Equivalency Certificate from IBCC Islamabad with at least 45% Marks or equivalent certificate from a recognized institution are eligible to apply.
2. Candidates holding Associate Degree in relevant discipline with at least 2.00 CGPA on the scale of 4.00 from any recognized university/ institution will join from the 5th semester of their degree program. Minimum duration of their degree shall be 2 years.
3. Candidates holding Bachelor Degree (14 years of education) with at least 45% marks in annual system or Associate Degree in other than relevant discipline with at least 2.00 CGPA on the scale of 4.00 from any recognized university/ institution will join from the Bridge semester of their degree program. Minimum duration of their Degree shall be 2.5 years.

Candidates need to pass an entry test or an aptitude interview conducted by the University.

Program Objectives:

The four year Microbiology program is designed in accordance with the guidelines of Higher Education Commission, Islamabad, Pakistan to provide the students an insight into the microbial diversity, their manipulation, basic cell culture techniques, reproduction, economic aspects and practical aspects to improve the human health, agriculture, food industry and environmental quality for overall improvement of socio-economic status of individuals at local and national level.

Program Outcomes:

The BS Microbiology graduates will be well versed with basic and applied concepts of Microbiology. The graduates will be able to identify, isolate, culture, characterize harmful and beneficial microorganisms. The students will be smart enough to critically analyze, work and find solutions to microbial problems in relation to health, agriculture, food, environment and human related aspects.

*BRIDGE SEMESTER

Course Code	Course Title	Cr. Hrs. 15
MB 100	General Microbiology-I	2-1
MB 212	General Microbiology-II	2-1
MB 213	Bacterial Genetics	2-1
MB 215	General Immunology	2-1
BIO 102	Cell Biology-I	2-1

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	17
ENG 101	Functional Communication (English – I)	3-0	
GS 123/240	Islamic Studies/Values, Ethics & Society (For Non Muslims)	2-0	
MA 100	Mathematics – I (Pre-Calculus)	3-0	
CH 102	Biochemistry – I	2-1	
MB 100	General Microbiology – I	2-1	
BIO 102	Cell Biology-I	2-1	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
ENG 290	Report Writing (English – III)	3-0	
MB 215	General Immunology	2-1	
MB 212	General Microbiology – II	2-1	
MB 222	Mycology	2-1	
MB 213	Bacterial Genetics	2-1	
MB 220	Human Physiology – I	2-1	

SEMESTER 5

Course Code	Course Title	Cr. Hrs.	18
MA 219	Biostatistics	3-0	
MB 342	Soil Microbiology	2-1	
MB 340	Microbial Taxonomy	2-1	
MB 334	Food Microbiology	2-1	
MB 338	Microbial Anatomy & Physiology	2-1	
MB 430	Medical Microbiology	2-1	

SEMESTER 7

Course Code	Course Title	Cr. Hrs.	18
MB 438	Molecular Mechanisms of Antimicrobial Drugs	2-1	
MB 332	Epidemiology	2-1	
MB 426	Techniques in Microbiology	2-1	
MB 434	Molecular Immunology	2-1	
MB 422	DNA Damage, Repair And Carcinogenesis	2-1	
RES 491	Research Project (Phase I)	0-3	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	17
ENG 111	Basic Communication Skills (English – II)	3-0	
GS 128	Pakistan Studies	2-0	
MA 110	Mathematics – II (Calculus)	3-0	
CH 110	Biochemistry – II	2-1	
CS 110	Introduction to Computers Science	2-1	
MB 101	Micorbial Biotechnology	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	17
MB 204	Bio-Safety and Risk Management	2-0	
BT 336	Immunobiology	2-1	
BIO 212	Cell Biology – II	2-1	
MB 223	General Microbiology – III	2-1	
MB 221	Human Physiology – II	2-1	
MB 207	Clinical Bacteriology	2-1	

SEMESTER 6

Course Code	Course Title	Cr. Hrs.	18
MB 344	Fresh Water Microbiology	2-1	
MB 343	Environmental Current Issues	3-0	
BT 335	Environmental Biotechnology	2-1	
MB 230	General Virology	3-0	
RES 380	Research Methodology	3-0	
CS 338	Bioinformatics	2-1	

SEMESTER 8

Course Code	Course Title	Cr. Hrs.	15
MB 440	Diagnostic Virology	2-1	
MB 442	Environmental Microbiology& Public Health	2-1	
MB 450	Microbial Enzyme Technology	2-1	
MB 446	Genetic Engineering	2-1	
RES 492	Research Project (Phase II)	0-3	

Master of Science in Microbiology

Program Code	122
Number of Courses	22 + Research Project
Credit Hours	72
Minimum Duration	4 Semesters, 2 Years
Maximum Duration	10 Semesters, 5 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

The candidate must have 14 years of education from recognized university or Degree Awarding Institutes with B.Sc. Microbiology or conventional B.Sc. or three years B.Sc. (Hons) securing at least 45% marks or 2nd division in annual system with any two of the following subjects: Botany, Zoology, Chemistry, Biochemistry, Biotechnology, Microbiology, Genetics, Physiology, Forestry or related biological subjects.

Program Objectives:

The curriculum designed for two years M.Sc. Microbiology will train the graduates to meet the challenges with the issues for broad spectrum of areas of Microbiology such as health, food, poultry, agricultural and industrial avenues. These skilled graduates will play a vital role in the uplift of economic growth of the country. The programme will also create awareness about role of microbiology in improving socio-economic uplift of the country and make liaison between microbiologists with society and industry.

Program Outcomes:

The successful graduates will thoroughly understand the basic and applied concepts of Microbiology. They will be capable to identify, isolate, culture and make genetic manipulation of harmful and beneficial microbes for the benefit of humanity. The graduate would be efficient in solving health, agricultural, food, environmental and other problems associated with microbes.

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	18
MB 100	General Microbiology-1	2-1	
MB 342	Soil Microbiology	2-1	
MB 340	Microbial Taxonomy	2-1	
MB 334	Food Microbiology	2-1	
MB 338	Microbial Anatomy & Physiology	2-1	
MB 430	Medical Microbiology	2-1	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
MB 438	Molecular Mechanisms of Antimicrobial Drugs	2-1	
MB 332	Epidemiology	2-1	
MB 426	Techniques in Microbiology	2-1	
MB 434	Molecular Immunology	2-1	
MB 422	DNA Damage, Repair and Carcinogenesis	2-1	
MA 303	Statistical Methods	3-0	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	18
MB 344	Fresh Water Microbiology	2-1	
MB 343	Environmental Current Issues	3-0	
BT 335	Environmental Biotechnology	2-1	
MB 230	General Virology	3-0	
RES 380	Research Methodology	3-0	
CS 338	Bioinformatics	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	18
MB 440	Diagnostic Virology	2-1	
MB 442	Environmental Microbiology & Public Health	2-1	
MB 450	Microbial Enzyme Technology	2-1	
MB 446	Genetic Engineering	2-1	
RES 480	Research Project	0-6	

NOTE: Students are encouraged to undergo Internship Program and Practical Learning Lab (PLL) (Details are given in Sections 27 & 28 of the Rules and Regulations.

Associate Degree in Botany

Program Code	164
Number of Courses	24
Credit Hours	70
Minimum Duration	4 Semesters, 2 Years
Maximum Duration	10 Semesters, 5 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

F.Sc. (Pre-Medical) or A-Levels with Equivalency Certificate from IBCC Islamabad with at least 45% Marks or an equivalent certificate from a recognized institution are eligible to apply. Candidates will have to pass an entry test/apptitude interview conducted by the University.

Program Objectives:

The two year Associate Degree in Botany follows the guidelines of Higher Education Commission, Islamabad, Pakistan. It trains the students in various aspects of botanical diversity including the taxonomy, physiology, ecology, ecosystem, genetics, medicinal plants, environmental biology and the current issues in botanical sciences. The graduates will be able to solve botanical, ecological and environmental problems to improve the human health and environmental quality for overall uplift of socio-economic status of community at local and national level.

Program Outcomes:

The AD program will enable the students to know the basic and applied aspects of Botany and their applications in the daily life. They will know about the foundation of botanical diversity, classification, morphology, biodiversity, ecosystem, genetics and other branches of botanical sciences and its relation to other sciences.

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	17
ENG 101	Functional Communication (English – I)	3-0	
GS 123/240	Islamic Studies/Values, Ethics & Society (For Non Muslims)	2-0	
MA 100	Mathematics – I (Pre-Calculus)	3-0	
BOT 101	Diversity of Plants	2-1	
MB 100	General Microbiology – I	2-1	
BIO 102	Cell Biology-I	2-1	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
ENG 290	Report Writing (English – III)	3-0	
BOT 201	Genetics & Evolution	2-1	
BOT 203	Morphological Terminology for seed Plants (Phytography)	2-1	
MB 222	Mycology	2-1	
BOT 205	Principles of Plant Systematics	2-1	
ZOO 201	Animal Diversity -I	2-1	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	17
ENG 111	Basic Communication Skills (English – II)	3-0	
GS 128	Pakistan Studies	2-0	
MA 110	Mathematics – II (Calculus)	3-0	
BOT 207	Plant Systematics, Anatomy & Embryology	2-1	
CS 110	Introduction to Computers Science	2-1	
BT 202	Fundamentals of Biotechnology	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	18
BOT 216	Plant Physiology & Biochemistry	2-1	
BOT 214	Ecosystem & its importance	2-1	
BOT 212	Virology & Bacteriology	2-1	
BOT 218	Biodiversity and Conservation	2-1	
BOT 220	Applied Ethnobotany	2-1	
ZOO 212	Animal Diversity-II	2-1	

NOTE: Students are encouraged to undergo Internship Program and Practical Learning Lab (PLL) (Details are given in Sections 27 & 28 of the Rules and Regulations.

Bachelor of Science in Botany

Program Code	155
Number of Courses	45 + Research Project
Credit Hours	138
Minimum Duration	8 Semesters, 4 Years
Maximum Duration	16 Semesters, 8 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

1. F.Sc. (Pre-Medical) or A-Levels with Equivalency Certificate from IBCC Islamabad with at least 45% Marks or an equivalent certificate from a recognized institution are eligible to apply.
2. Candidates holding Associate Degree in relevant discipline with at least 2.00 CGPA on the scale of 4.00 from any recognized university/ institution will join from the 5th semester of their degree program. Minimum duration of their degree shall be 2 years.
3. Candidates holding Bachelor Degree (14 years of education) with at least 45% marks in annual system or Associate Degree in other than relevant discipline with at least 2.00 CGPA on the scale of 4.00 from any recognized university/ institution will join from the Bridge semester of their Degree program. Minimum duration of their degree shall be 2.5 years.

Candidates need to pass an entry test or an aptitude interview conducted by the University.

Program Objectives:

The four year BS Botany program is designed as per guidelines suggested by Higher Education Commission, Islamabad, Pakistan. It will provide the students an insight to the botanical diversity and its importance. The program envisages basics of Botany that gradually expand to modern molecular aspects of plant sciences including the taxonomy, physiology, ecology, ecosystem, genetics, medicinal plants, environmental biology and the current issues in botanical sciences. The graduates will be able to solve botanical and environmental problems to improve the human health and environmental quality for overall improvement of socio-economic status of human communities at local and national level.

Program Outcomes:

The BS program will enable the students to know the basic and applied aspects of various branches of Botany and their applications in solving the environmental, genetic, food, agricultural, forestry, range management, conservation of plant resources, biodiversity & wildlife, pollution and other daily life ecological problems. They will master in disciplines like Ecology, Pathology, Mycology, Phycology, Physiology, Genetics, Biodiversity, Ethnobotany and climate change. The graduates will be able to assess the environmental, ecological and botanical problems and suggest possible solutions. They will have the capability to discuss the botany of the country at any national and international forum.

*BRIDGE SEMESTER

Course Code	Course Title	Cr. Hrs. 15
BOT 101	Diversity of Plants	2-1
BOT 203	Morphological Terminology for Seed Plants (Phytography)	2-1
BOT 212	Virology & Bacteriology	2-1
BIO 102	Cell Biology-I	2-1
BIO 311	Molecular Biology-I	2-1

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	17
ENG 101	Functional Communication (English – I)	3-0	
GS 123/240	Islamic Studies/Values, Ethics & Society (For Non Muslims)	2-0	
MA 100	Mathematics-I (Pre-calculus)	3-0	
BOT 101	Diversity of Plants	2-1	
MB 100	General Microbiology-I	2-1	
BIO 102	Cell Biology-I	2-1	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
ENG 290	Report Writing (English – III)	3-0	
BOT 201	Genetics & Evolution	2-1	
BOT 203	Morphological Terminology for Seed Plants (Phytography)	2-1	
MB 222	Mycology	2-1	
BOT 205	Principles of Plant Systematics	2-1	
ZOO 201	Animal Diversity-I	2-1	

SEMESTER 5

Course Code	Course Title	Cr. Hrs.	18
MA 302	Biostatistics & Statistical Packages	3-0	
MB 342	Soil Microbiology	2-1	
BOT 307	Medicinal Plants (Pharmacognosy)	2-1	
BOT 304	Phycology	2-1	
BOT 308	Pant Physiology-I	2-1	
CH 301	Biochemistry-I	2-1	

SEMESTER 7

Course Code	Course Title	Cr. Hrs.	18
BOT 420	Forensic Botany	3-0	
BIO 411	Molecular Biology	2-1	
BOT 412	Synecology of Plants	2-1	
BOT 319	Genetics-I	2-1	
BOT 306	Diversity of Archegoniates	2-1	
RES 491	Research Project Phase-I	0-3	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	17
ENG 111	Basic Communication Skills (English – II)	3-0	
GS 128	Pakistan Studies	2-0	
MA 110	Mathematics-II (Calculus)	3-0	
BOT 207	Plant Systematic, Anatomy & Embryology	2-1	
CS 110	Introduction to Computer Science	2-1	
BT 202	Fundamentals of Biotechnology	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	18
BOT 216	Plant Physiology & Biochemistry	2-1	
BOT 214	Ecosystem & its importance	2-1	
BOT 212	Virology & Bacteriology	2-1	
BOT 218	Biodiversity and Conservation	2-1	
BOT 220	Applied Ethnobotany	2-1	
ZOO 212	Animal Diversity-II	2-1	

SEMESTER 6

Course Code	Course Title	Cr. Hrs.	18
BOT 313	Pant Physiology-II	2-1	
BOT 310	Autecology of Plants	2-1	
CH 311	Biochemistry-II	2-1	
BOT 311	Phytochemistry	2-1	
RES 380	Research Methodology	3-0	
CS 338	Bioinformatics	2-1	

SEMESTER 8

Course Code	Course Title	Cr. Hrs.	15
BOT 414	Genetics-II	2-1	
BOT 416	Plant Pathology	2-1	
BOT 422	Environmental Biology	2-1	
GS 400	Climate Change	2-1	
RES 492	Research Thesis Phase-II	0-3	

Master of Science in Botany

Program Code	156
Number of Courses	22 + Research Project
Credit Hours	72
Minimum Duration	4 Semesters, 2 Years
Maximum Duration	10 Semesters, 5 Years
Minimum CGPA Required To Earn Degree	2.00

Eligibility :

Candidates having B.Sc. (14 years of education) with Botany as one of the subjects with 45% marks or second division from recognized Degree Awarding institution or University are eligible to apply. Candidates need to pass an entry test/apptitude interview conducted by the university.

Program Objectives:

The Two year MSc Degree in Botany follows the guidelines of Higher Education Commission, Islamabad. The students are trained in various aspects of botanical diversity including the taxonomy, physiology, ecology, ecosystem, genetics, medicinal plants and environmental biology. The graduates will be able to improve the socio-economic uplift through solving conservation and environmental issues at local and national level.

Program Outcomes:

The MSc program will enable the students to know the basic and applied aspects of various branches of Botany and their application in solving the environmental, genetic, food, agricultural, forestry, range management, conservation of plant resources, biodiversity & wildlife, pollution and other daily life ecological problems. The graduates will be able to assess the ecological and botanical problems and suggest possible solutions.

SEMESTER 1

Course Code	Course Title	Cr. Hrs.	18
MA 302	Biostatistics & Statistical Packages	3-0	
MB 342	Soil Microbiology	2-1	
BOT 307	Medicinal Plants (Pharmacognosy)	2-1	
BOT 304	Phycology	2-1	
BOT 308	Pant Physiology-I	2-1	
CH 301	Biochemistry-I	2-1	

SEMESTER 3

Course Code	Course Title	Cr. Hrs.	18
BOT 420	Forensic Botany	3-0	
BIO 411	Molecular Biology	2-1	
BOT 412	Synecology of Plants	2-1	
BOT 319	Genetics-I	2-1	
BOT 306	Diversity of Archegoniates	2-1	
RES 491	Research Project Phase-I	0-3	

SEMESTER 2

Course Code	Course Title	Cr. Hrs.	18
BOT 313	Plant Physiology-II	2-1	
BOT 310	Autecology of Plants	2-1	
CH 311	Biochemistry-II	2-1	
BOT 311	Phytochemistry	2-1	
RES 380	Research Methodology	3-0	
CS 338	Bioinformatics	2-1	

SEMESTER 4

Course Code	Course Title	Cr. Hrs.	18
BOT 414	Genetics-II	2-1	
BOT 416	Plant Pathology	2-1	
BOT 422	Environmental Biology	2-1	
GS 400	Climate Change	2-1	
BOT 212	Virology & Bacteriology	2-1	
RES 492	Research Project Phase-II	0-3	

NOTE: Students are encouraged to undergo Internship Program and Practical Learning Lab (PLL) (Details are given in Sections 27 & 28 of the Rules and Regulations.