

Faculty of Sciences



Dr. Mushtaq Ahmad Saleem
Dean

Welcome to the Faculty of Sciences, University of Central Punjab. Our disciplines will introduce you to the wonders of the natural world, from infinitesimally small subatomic particles to the infinitely large universe – and everything else in between. Along the way, you will acquire new skills, sharpen your mind, develop your curiosity, and gain facility in the language of numbers. Scientist, teacher, physician or entrepreneur - whatever your career goal are, an education in science will help you get there. The Faculty of Sciences offers undergraduate programs in Mathematics, Physics, Chemistry, Botany and Zoology. Through both practical and theory-based learning, we provide the exciting and engaging environment required to inspire creativity, innovation and collaboration. Faculty of Sciences is committed to see all its graduates scientifically trained and well equipped to tackle global challenges. Students have opportunity to enhance their learning experience by participating in our distinctive undergraduate programs. Our progressive faculty aims to provide its students with excellent, contemporary, academically challenging programs, quality teaching and up-to-date learning environment. It is an exciting time to be in science. I invite you to join us to explore, discover and achieve at Faculty of Sciences.

Faculty Members



Dr. Mushtaq A. Saleem

Post-Doc Zoology (Newcastle General Hospital and the University of Newcastle upon Tyne, UK)
PhD Zoology Environment Biochemistry/ Biochemical Toxicology
(University of the Punjab, Lahore)
MSc Applied Entomology (University Newcastle upon Tyne, UK)
Professor and Acting Dean



Dr. H. Rizwana Kausar

Post-Doc Physics (University of Zurich, Switzerland)
PhD Applied Mathematics (University of the Punjab, Lahore)
MPhil Applied Mathematics (University of the Punjab, Lahore)
MSc Applied Mathematics, (Islamia University, Bahawalpur)
Associate Professor/Associate Dean Faculty of Sciences



Dr. Shafiq ur Rehman

PhD Chemistry (Government College University, Lahore)
MPhil Chemistry (Government College University, Lahore)
MSc Chemistry (University of the Punjab, Lahore)
Assistant Professor/HOD-Chemistry



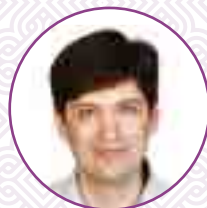
Dr. Nadeem Ullah

PhD Botany (Government College University, Lahore)
MPhil Botany (Government College University, Lahore)
MSc Botany (Government College University, Lahore)
Assistant Professor/HOD-Botany



Dr. Asma Naeem

PhD Zoology (University of the Punjab, Lahore)
MPhil (University of the Punjab, Lahore)
MSc (University of the Punjab, Lahore)
Assistant Professor/HOD-Zoology



Dr. Faheem Ahmed Khan

PhD Zoology (Huazhong Agricultural University Wuhan, China)
MS Crop Genetics & Breeding, (Huazhong Agricultural University, China)
BSc (Hons) Agriculture, (University of Arid Agriculture, Rawalpindi)
Assistant Professor



Dr. Syeda Amber Yousaf

PhD Physics (Government College University, Lahore)
MPhil Physics (Government College University, Lahore)
MSc Physics (Government College University, Lahore)
Assistant Professor



Dr. Khalida Naseem

PhD Physical Chemistry (University of the Punjab)
MPhil Chemistry (University of the Punjab, Lahore)
MSc Chemistry (University of the Punjab, Lahore)
Assistant Professor



Mr. Atif Rahman Alvi

PhD High Energy Physics-In Progress (University of the Punjab, Lahore)
MPhil Physics (University of the Punjab, Lahore)
MSc Physics (Bahauddin Zakariya University, Multan)
Lecturer/HOD-Physics



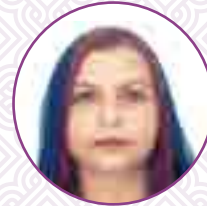
Mr. Muhammad Saad Tariq

PhD Solid State Physics-In Progress (University of the Punjab, Lahore)
MPhil Solid State Physics (University of the Punjab, Lahore)
MSc (University of the Punjab, Lahore)
Lecturer



Mr. Adnan Rafiq Siddique

MPhil Mathematics (University of Lahore)
MSc Mathematics (University of the Punjab, Lahore)
MSc Computer Science (University of the Punjab, Lahore)
Lecturer/HOD-Mathematics



Dr. Shazia Imtiaz Nagra

MSc (Hons) Veterinary Clinical Medicine and Surgery (University of Agriculture Faisalabad)
Doctor of Veterinary Medicine (University of Agriculture Faisalabad)
Lecturer



Mr. Muhammad Idnan

PhD Wildlife and Ecology-In Progress (University of Veterinary and Animal Sciences, Lahore)
MPhil Zoology (University of Veterinary and Animal Sciences, Lahore)
MSc Zoology (University of the Punjab, Lahore)
Lecturer



Ms. Ammara Ihsan

MPhil Mathematics (University of Lahore)
MSc Mathematics (Government College University, Lahore)
Lecturer

**Ms. Amna Mahmood**

MS Computer Science (University of Central Punjab)
BCOM (Punjab College of Commerce, Lahore)
Lecturer

**Ms. Sadaf Javaid**

MPhil Chemistry (University of Lahore)
BSc (Hons) Chemistry (Kinnaird College for Women University, Lahore)
Lecturer

**Mr. Muhammad Saleem**

PhD Organic Chemistry-In Progress (University of Engineering and Technology, Lahore)
MPhil Chemistry (University of Engineering and Technology, Lahore)
MSc Chemistry (University of the Punjab, Lahore)
Lecturer

**Ms. Ayesha Kermani**

MS Mathematics (University of the Punjab, Lahore)
BS Mathematics (University of the Punjab, Lahore)
Lecturer

**Ms. Rosha Tahir**

MPhil Computational Mathematics (University of the Punjab, Lahore)
BS Mathematic (University of the Punjab, Lahore)
Lecturer

**Ms. Fareeha Anjum**

MPhil Mathematics (University of the Punjab, Lahore)
BS (Hons) Mathematics (Forman Christian College University, Lahore)
Lecturer

**Mr. Muhammad Zeeshan**

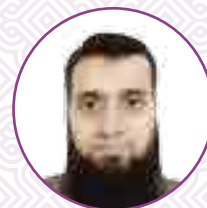
MS Mathematics (COMSATS University, Islamabad)
BS Mathematics (University of Education, Lahore)
Lecturer

**Mr. Muhammad Asim Farooq**

MS Mathematics (National University of Computer and Emerging Sciences)
BS Mathematics (University of Sargodha)
Lecturer

**Mr. Kaleem Ullah**

MS Plant Biotechnology (National University of Sciences and Technology, Islamabad)
BSc (Hons) Botany (Government College University, Lahore)
Lecturer

**Mr. Ahmed Dogar**

MPhil Statistics (City University London, UK)
BS (Hons) Actuarial Sciences (CASS Business School, City University, London)
Lecturer

BS Chemistry

The BS Chemistry program prepare students for careers as professional chemists and serves as a foundation for careers in other fields such as biology and medicine. The curriculum offers a thorough fundamental knowledge of the major fields of chemistry covering the general areas of inorganic, organic, physical chemistry and bounteous specialized areas. Students gain professional laboratory experience in organic and inorganic synthesis, analytical methods, physical chemical measurements and biochemical engineering.

Career Prospects

Chemistry is a field that has a wide scope. Professionals in this field have the opportunity to work in multiple areas due to the overlap between chemistry and other sciences. Subsequently, for further studies, students can choose one of many different fields that require

professionals with experience in chemistry. The door is therefore open for postgraduate and higher qualifications as you climb the ladder of success. A BS chemist can easily work in any of the areas listed below:

- Chemical Industry
- Sugar Industry
- Mining and Mineral Department
- Glass Industry
- Forensic Labs
- Research Labs (PCSIR, PITAC etc.)
- Pharmaceutical Industry
- Cement Industry
- Seed Companies
- Petro-Chemical Industry
- Ceramics Industry
- Beverages Industry
- Education Sector (PPSC, FPSC)

Admission Requirements

- (i) Intermediate with Chemistry securing at least 45% marks

in aggregate. In case of foreign qualification, equivalence from IBCC will be required.

- (ii) UCP admission test or HEC approved test

Degree Requirements

Each candidate of BS Chemistry degree is required to complete 138 Cr. Hrs. with the CGPA of 2.00 on the scale of 4.00 as per the following detail:

	Area	Cr. Hrs.
a)	Compulsory Requirements	27
b)	General Courses	21
c)	Foundation Courses	24
d)	Major Courses	34
e)	Elective Courses	06
f)	Specialization Courses	20
g)	Research Project	06
	Total	138

a) Compulsory Requirements (27 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Functional English	CHHU1013	3
Mathematics I (Algebra)	CHMT1013	3
Pakistan Studies	CHHU1023	3
Communication Skills	CHHU1033	3
Computer Application & Programming	CHCS1013	3
Islamic Studies/Ethics	CHHU1043	3
Technical Writing & Presentation Skills	CHHU2053	3
Advanced Computer Applications	CHCS2023	3
Introduction to Psychology	CHHU2073	3

b) General Courses (21 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Principles of Animal Life I	CHZO1012	2
Principles of Animal Life I Lab	CHZO1011	1
Diversity of Plants	CHBO1012	2
Diversity of Plants Lab	CHBO1011	1
Cell Biology, Genetics and Evolution	CHBO1022	2
Cell Biology, Genetics and Evolution Lab	CHBO1021	1
Principles of Animal Life II	CHZO1022	2
Principles of Animal Life II Lab	CHZO1021	1
Biological Techniques	CHZO2032	2
Biological Techniques Lab	CHZO2031	1
Introduction to Sociology	CHHU2063	3
Plant Physiology and Ecology	CHBO2032	2
Plant Physiology and Ecology Lab	CHBO2031	1

c) Foundation Courses (24 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Inorganic Chemistry	CH1103	3
Inorganic Chemistry Lab	CH1101	1
Physical Chemistry	CH1203	3
Physical Chemistry Lab	CH1201	1
Organic Chemistry	CH2303	3
Organic Chemistry Lab	CH2301	1
Statistics	CHMT2023	3
Basic Pharmaceutical and Forensic Chemistry	CH2402	2
Basic Pharmaceutical and Forensic Chemistry Lab	CH2401	1
Biochemistry I	CH2602	2
Biochemistry I Lab	CH2601	1
Analytical Chemistry I	CH2502	2
Analytical Chemistry I Lab	CH2501	1

d) Major Courses (34 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Inorganic Chemistry II	CH3113	3
Inorganic Chemistry II Lab	CH3111	1
Organic Chemistry II	CH3313	3
Organic Chemistry II Lab	CH3311	1
Physical Chemistry II	CH3213	3
Physical Chemistry II Lab	CH3211	1
Analytical Chemistry II	CH3513	3
Analytical Chemistry II Lab	CH3511	1
Applied Chemistry	CH3012	2
Inorganic Chemistry III	CH3123	3
Inorganic Chemistry III Lab	CH3121	1
Organic Chemistry III	CH3323	3
Organic Chemistry III Lab	CH3321	1
Physical Chemistry III	CH3223	3
Physical Chemistry III Lab	CH3221	1
Biochemistry II	CH3613	3
Biochemistry II Lab	CH3611	1

e) Elective Courses (06 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Instrumental Analysis and Analytical Techniques	CH4022	2
Instrumental Analysis and Analytical Techniques Lab	CH4021	1
Environmental Chemistry	CH4033	3

f) Specialization Courses (20 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Specialization I	CH4xx3	3
Specialization II	CH4xx3	3
Specialization III	CH4xx3	3
Specialization IV	CH4xx3	3
Specialization V	CH4xx3	3
Specialization VI	CH4xx3	3
Specialization Lab I	CH4xx1	1
Specialization Lab II	CH4xx1	1

Students can choose the specialization from the given domains

Inorganic Chemistry

Course Title	Code	Cr. Hrs.
Inorganic Reaction Mechanism	CH4133	3
π -Acceptor Ligands and Inorganic Polymers	CH4143	3
Inorganic Spectroscopy	CH4153	3
Organometallics	CH4163	3
Symmetry and Magneto Chemistry	CH4173	3
Radio and Nuclear Chemistry	CH4183	3
Inorganic Chemistry Lab I	CH4101	1
Inorganic Chemistry Lab II	CH4111	1

Organic Chemistry

Course Title	Code	Cr. Hrs.
Heterocyclic and Organometallic Compounds	CH4333	3
Reactive Intermediates	CH4343	3
Organic Spectroscopy	CH4353	3

Course Title	Code	Cr. Hrs.
Natural Products	CH4363	3
Organic Synthesis	CH4373	3
Medicine in Chemistry	CH4383	3
Organic Chemistry Lab I	CH4301	1
Organic Chemistry Lab II	CH4311	1

Physical Chemistry

Course Title	Code	Cr. Hrs.
Electrochemistry and Statistical		
Thermodynamics	CH4233	3
Polymer Chemistry	CH4243	3
Quantum Chemistry and Molecular Spectroscopy	CH4253	3
Reaction Dynamics	CH4263	3
Radiation and Photochemistry	CH4273	3
Colloid and Surface Chemistry	CH4283	3
Physical Chemistry Lab I	CH4201	1
Physical Chemistry Lab II	CH4211	1

Analytical Chemistry

Course Title	Code	Cr. Hrs.
Atomic Spectroscopy	CH4523	3
Electro Analytical Techniques	CH4533	3
Advanced Separation Techniques	CH4543	3
Luminescence Spectroscopy and Thermal Analysis	CH4553	3

Course Title	Code	Cr. Hrs.
Nuclear Analytical Techniques	CH4563	3
Food and Drug Analysis	CH4573	3
Analytical Chemistry Lab I	CH4501	1
Analytical Chemistry Lab II	CH4511	1

g) Research Project (06 Cr. Hrs.)

After the completion of 90 Cr. Hrs., the students are required to demonstrate their practical skills in the field of Chemistry by designing and implementing a research project worth 6 Cr. Hrs. The project shall be completed in two parts as given below:

Course Title	Code	Cr. Hrs.
Research Project I	CH4903	3
Research Project II	CH4913	3

Volunteer Service (CH3000)

Each student is required to complete 65 hours community work during the program, which would be a pre requisite for the award of degree.

Program Duration

This is a four years degree program comprising of 8 semesters. There is a Fall and a Spring semester in each year. The summer semester is utilized for improve / repeat / deficiency courses. The maximum duration to complete the BS Chemistry program is 7 years.

Scheme of Studies BS Chemistry**Semester-I (19 Cr. Hrs.)**

Course Code	Course Title	Category	Cr. Hrs.
CHHU1013	Functional English	Compulsory	3
CHMT1013	Mathematics I (Algebra)	Compulsory	3
CHHU1023	Pakistan Studies	Compulsory	3
CHZO1012	Principles of Animal Life I	General	2
CHZO1011	Principles of Animal Life I Lab	Lab	1
CHBO1012	Diversity of Plants	General	2
CHBO1011	Diversity of Plants Lab	Lab	1
CH1103	Inorganic Chemistry	Foundation	3
CH1101	Inorganic Chemistry Lab	Lab	1

Semester-II (19 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
CHHU1033	Communication Skills	Compulsory	3
CHCS1013	Computer Application & Programming	Compulsory	3
CHHU1043	Islamic Studies/Ethics	Compulsory	3
CHBO1022	Cell Biology, Genetics and Evolution	General	2
CHBO1021	Cell Biology, Genetics and Evolution Lab	Lab	1
CHZO1022	Principles of Animal Life II	General	2
CHZO1021	Principles of Animal Life II Lab	Lab	1
CH1203	Physical Chemistry	Foundation	3
CH1201	Physical Chemistry Lab	Lab	1

Scheme of Studies BS Chemistry

Semester-III (19 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
CHHU2053	Technical Writing & Presentation Skills	Compulsory	3
CHCS2023	Advanced Computer Application	Compulsory	3
CHZO2032	Biological Techniques	General	2
CHZO2031	Biological Techniques Lab	Lab	1
CHHU2063	Introduction to Sociology	General	3
CH2303	Organic Chemistry	Foundation	3
CH2301	Organic Chemistry Lab	Lab	1
CHMT2023	Statistics	Foundation	3

Semester-IV (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
CHHU2073	Introduction to Psychology	Compulsory	3
CHBO2032	Plant Physiology and Ecology	General	2
CHBO2031	Plant Physiology and Ecology Lab	Lab	1
CH2402	Basic Pharmaceutical and Forensic Chemistry	Foundation	2
CH2401	Basic Pharmaceutical and Forensic Chemistry Lab	Lab	1
CH2602	Biochemistry I	Foundation	2
CH2601	Biochemistry I Lab	Lab	1
CH2502	Analytical Chemistry I	Foundation	2
CH2501	Analytical Chemistry I Lab	Lab	1

Semester-V (18 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
CH3113	Inorganic Chemistry II	Major	3
CH3111	Inorganic Chemistry II Lab	Lab	1
CH3313	Organic Chemistry II	Major	3
CH3311	Organic Chemistry II Lab	Lab	1
CH3213	Physical Chemistry II	Major	3
CH3211	Physical Chemistry II Lab	Lab	1
CH3513	Analytical Chemistry II	Major	3
CH3511	Analytical Chemistry II Lab	Lab	1
CH3012	Applied Chemistry	Major	2

Scheme of Studies BS Chemistry

Semester-VI (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
CH3123	Inorganic Chemistry III	Major	3
CH3121	Inorganic Chemistry III Lab	Lab	1
CH3323	Organic Chemistry III	Major	3
CH3321	Organic Chemistry III Lab	Lab	1
CH3223	Physical Chemistry III	Major	3
CH3221	Physical Chemistry III Lab	Lab	1
CH3613	Biochemistry II	Major	3
CH3611	Biochemistry II Lab	Lab	1

Semester-VII (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
CH4xx3	Specialization I	Specialization	3
CH4xx3	Specialization II	Specialization	3
CH4xx3	Specialization III	Specialization	3
CH4xx1	Specialization Lab I	Lab	1
CH4022	Instrumental Analysis and Analytical Techniques	Elective	2
CH4021	Instrumental Analysis and Analytical Techniques Lab	Lab	1
CH4903	Research Project I	Research Project	3

Semester-VIII (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
CH4xx3	Specialization IV	Specialization	3
CH4xx3	Specialization V	Specialization	3
CH4xx3	Specialization VI	Specialization	3
CH4xx1	Specialization Lab II	Lab	1
CH4033	Environmental Chemistry	Elective	3
CH4913	Research Project II	Research Project	3

BS Zoology

Zoology is the scientific study of the characteristics and classification of animals. Zoology is a vibrant and growing discipline with substantial relevance for modern society. Knowledge of animal's biology contributes to the development strategies to reduce and cope with pollution, strive for renewable sources, deal with environmental changes, discover new biologically based solution to human/animal diseases and develop biopharmaceuticals. The study of Zoology is increasingly recognized as vital for understanding and protecting our planet.

Career Prospects

Zoology is the scientific study of animals. Those who study Zoology are known as zoologists. They study the evolution, behavior, interactions, conservation, classification and distribution of animals. Zoologists often specialize in marine biology, parapsychology and genetics. While studying the morphology, physiology,

anatomy and taxonomy of animals. Zoologists have a strong demand between fishing and aquatic farms, natural parks and nature reserves, research companies, institutional academies, botanical gardens and environmental protection agencies. Both the government and private districts have jobs available for zoologists in their spheres. Those who apply for this career must appreciate nature and enthusiasm for animals. It takes a lot of energy and time to observe, investigate and research animals as they are constantly changing in the habitat and suffer from human impact and captivity. Jobs directly related to this degree include:

- Ecologist
- Environmental Consultant
- Field Trials Officer
- Marine Scientist
- Nature Conservation Officer
- Physician Associate
- Research Scientist (Life Sciences)
- Zookeeper

a) Zoology Foundation Courses (34 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Principles of Animal Life-I	Z01303	3
Principles of Animal Life-I Lab	Z01301	1
Principles of Animal Life-II	Z01313	3
Principles of Animal Life-II Lab	Z01311	1
Animal Diversity-I (Invertebrates)	Z02323	3
Animal Diversity-I (Invertebrates)-Lab	Z02321	1
Animal Diversity-II (Chordates)	Z02333	3
Animal Diversity-II (Chordates)-Lab	Z02331	1
Animal Form & Function-I	Z02343	3

Animal Form & Function-I Lab	Z02341	1
Animal Form & Function-II	Z02353	3
Animal Form & Function-II Lab	Z02351	1
General Biochemistry	Z03233	3
General Biochemistry-Lab	Z03231	1
Evolution & Principles of Systematics	Z03702	2
Evolution & Principles of Systematics Lab	Z03701	1
Biological Techniques	Z03412	2
Biological Techniques Lab	Z03411	1

Admission Requirements

- (i) Intermediate or equivalent with Biology securing at least 45% marks in aggregate. In case of foreign qualification, equivalence from IBCC will be required.
- (ii) UCP admission test or HEC approved test.

Degree Requirements

Each candidate of BS Zoology degree is required to complete 137 Cr. Hrs. with the CGPA of 2.0 on the scale of 4.0 as per the following detail:

Area	Cr. Hrs.
a) Compulsory	27
b) General	23
c) Foundation	34
d) Major	35
e) Elective	12
f) Project	6
Total	137

b) Zoology General Courses (23 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Diversity of Plants	Z01102	2
Diversity of Plants-Lab	Z01101	1
Inorganic Chemistry	Z01202	2
Inorganic Chemistry-Lab	Z01201	1
Plant Systematics, Anatomy & Development	Z01112	2
Plant Systematics, Anatomy & Development-Lab	Z01111	1
Physical Chemistry	Z01212	2
Physical Chemistry-Lab	Z01211	1
Bacteriology and Virology	Z02502	2
Bacteriology and Virology-Lab	Z02501	1
Organic Chemistry	Z02222	2
Organic Chemistry-Lab	Z02221	1
Plant Physiology and Ecology	Z02122	2
Plant Physiology and Ecology-Lab	Z02121	1
Geography	Z02802	2

c) Zoology Compulsory Courses (27 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Functional English	ZOHU1003	3
Pakistan Studies	ZOHU1013	3
Mathematics-I	ZOMT1003	3
Communication Skills	ZOHU1023	3
Islamic Studies/Ethics	ZOHU1033	3
Introduction to Computer	ZOCS1003	3
Technical Writing & Presentation Skills	ZOHU2043	3
Biostatistics	ZOMT2012	2
Biostatistics-Lab	ZOMT2011	1
Fundamentals of Microbiology	Z04432	2
Fundamentals of Microbiology-Lab	Z04431	1



d) Microbiology Major Courses (35 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Cell & Molecular Biology	Z03403	3
Cell & Molecular Biology-Lab	Z03401	1
Physiology	Z03603	3
Physiology-Lab	Z03601	1
Animal Behavior	Z03362	2
Animal Behavior -Lab	Z03361	1
Wildlife	Z03832	2
Developmental Biology	Z03423	3
Developmental Biology-Lab	Z03421	1
Genetics	Z03713	3
Genetics-Lab	Z03711	1
Zoogeography and Paleontology	Z03812	2
Zoogeography & Paleontology-Lab	Z03811	1
Environmental Biology	Z04823	3
Environmental Biology-Lab	Z04821	1
Special Paper (Univ. Optional)	Z04xx3	3
Special Paper (Univ. Optional)-Lab	Z04xx1	1
Bioinformatics	Z04012	2
Bioinformatics-Lab	Z04011	1

e) Zoology Elective Depth Courses (12 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Elective I	Z04xx2	2
Elective I Lab	Z04xx1	1
Elective II	Z04xx2	2
Elective II Lab	Z04xx1	1
Elective III	Z04xx2	2
Elective III Lab	Z04xx1	1
Elective IV	Z04xx2	2
Elective IV Lab	Z04xx1	1

**Elective Courses to be offered (Student take 12 credit hours from Elective Course)**

Course Title	Code	Cr. Hrs.
Physiological Systems and Adaptations & Lab	Z046412/1	3
Immunology & Lab	Z04512/1	3
Economic Zoology & Lab	Z04372/1	3
Insects of Veterinary and Medical Importance & Lab	Z04382/1	3
Environmental Toxicology & Lab	Z04832/1	3
Fish Culture & Lab	Z04392/1	3
Biology and Control of Vertebrate Pests & Lab	Z04482/1	3
Helminthology and Host-Parasite Relationship & Lab	Z04442/1	3
General and Comparative Endocrinology & Lab	Z04452/1	3
Hematology & Lab	Z04462/1	3
Entomology & Lab	Z04472/1	3
Physiology of Coordination & Lab	Z04652/1	3

f) Research Project (06 Cr. Hrs.)

After the completion of 90 Cr. Hrs., the students are required to demonstrate their practical skills in the field of Zoology by designing and implementing a research project worth 6 Cr. Hrs. The project shall be completed in two parts as given below:

Course Title	Code	Cr. Hrs.
Research Project I	Z04903	3
Research Project II	Z04913	3

Community Work (Z03000)

Each student is required to complete 65 hours of community work, usually after 4th semester which would be a prerequisite for the award of degree.

Program Duration

This is a four-year degree program comprising of 8 semesters. There will be a Fall and a Spring semester in each year. The summer semester will be utilized for internship / improvement or deficiency courses. The maximum duration to complete BS Zoology degree is 7 years.

Scheme of Studies BS Zoology

Semester-I (19 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ZOHU1003	Functional English	Compulsory	3
ZOHU1013	Pakistan Studies	Compulsory	3
ZOMT1003	Mathematics-I	Compulsory	3
ZO1102	Diversity of Plants	General	2
ZO1101	Diversity of Plants-Lab	General Lab	1
ZO1202	Inorganic Chemistry	General	2
ZO1201	Inorganic Chemistry-Lab	General Lab	1
ZO1303	Principles of Animal Life-I	Foundation	3
ZO1301	Principles of Animal Life-I Lab	Foundation Lab	1

Semester-II (19 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ZOHU1023	Communication Skills	Compulsory	3
ZOHU1033	Islamic Studies/Ethics	Compulsory	3
ZOCS1003	Introduction to Computer	Compulsory	3
ZO1112	Plant Systematics Anatomy & Development	General	2
ZO1111	Plant Systematics, Anatomy & Development-Lab	General Lab 1	
ZO1212	Physical Chemistry	General	2
ZO1211	Physical Chemistry-Lab	General Lab	1
ZO1313	Principles of Animal Life-II	Foundation	3
ZO1311	Principles of Animal Life-II Lab	Foundation Lab	1

Semester-III (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ZOHU2043	Technical Writing & Presentation Skills	Compulsory	3
ZOMT2012	Biostatistics	Compulsory	2
ZOMT2011	Biostatistics-Lab	Compulsory Lab	1
ZO2502	Bacteriology and Virology	General	2
ZO2501	Bacteriology and Virology-Lab	General Lab	1
ZO2222	Organic Chemistry	General	2
ZO2221	Organic Chemistry-Lab	General Lab	1
ZO2323	Animal Diversity-I (Invertebrates)	Foundation	3
ZO2321	Animal Diversity-I (Invertebrates)-Lab	Foundation Lab	1

Scheme of Studies BS Zoology

Semester-IV (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ZO2122	Plant Physiology and Ecology	General	2
ZO2121	Plant Physiology and Ecology-Lab	General Lab	1
ZO2802	Geography	General	2
ZO2333	Animal Diversity-II (Chordates)	Foundation	3
ZO2331	Animal Diversity-II (Chordates)-Lab	Foundation Lab	1
ZO2343	Animal Form & Function-I	Foundation	3
ZO2341	Animal Form & Function-I Lab	Foundation Lab	1
ZO2353	Animal Form & Function-II	Foundation	3
ZO2351	Animal Form & Function-II Lab	Foundation Lab	1

Semester-V (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ZO3233	General Biochemistry	Foundation	3
ZO3231	General Biochemistry-Lab	Foundation Lab	1
ZO3403	Cell & Molecular Biology	Major	3
ZJ3401	Cell & Molecular Biology-Lab	Major Lab	1
ZO3603	Physiology	Major	3
ZO3601	Physiology-Lab	Major Lab	1
ZO3362	Animal Behavior	Major	2
ZO3361	Animal Behavior -Lab	Major Lab	1
ZO3832	Wildlife	Major	2

Semester-VI (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ZO3702	Evolution & Principles of Systematics	Foundation	2
ZO3701	Evolution & Principles of Systematics Lab	Foundation Lab	1
ZO3411	Biological Techniques	Foundation	1
ZO3412	Biological Techniques Lab	Foundation Lab	2
ZO3423	Developmental Biology	Major	3
ZO3421	Developmental Biology-Lab	Major Lab	1
ZO3713	Genetics	Major	3
ZO3711	Genetics-Lab	Major Lab	1
ZO3812	Zoogeography and Paleontology	Major	2
ZO3811	Zoogeography & Paleontology-Lab	Major Lab	1

Scheme of Studies BS Zoology

Semester-VII (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ZO4432	Fundamentals of Microbiology	Compulsory	2
ZO4431	Fundamentals of Microbiology-Lab	Compulsory Lab	1
ZO4823	Environmental Biology	Major	3
ZO4821	Environmental Biology-Lab	Major Lab	1
ZO4xx3	Special Paper (Univ. Optional)	Major	3
ZO4xx1	Special Paper (Univ. Optional)-Lab	Major Lab	1
ZO4903	Research Project I	Project	3
ZO4xx2	Elective I	Elective	2
ZO4xx1	Elective-I Lab	Elective Lab	1

Semester-VIII (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
ZO4012	Bioinformatics	Major	2
ZO4011	Bioinformatics-Lab	Major Lab	1
ZO4913	Research Project II	Project	3
ZO4xx2	Elective II	Elective	2
ZO4xx1	Elective II Lab	Elective Lab	1
ZO4xx2	Elective III	Elective	2
ZO4xx1	Elective III Lab	Elective Lab	1
ZO4xx2	Elective-IV	Elective	2
ZO4xx1	Elective-IV Lab	Elective Lab	1

BS Botany

The program is solidly grounded in the basic sciences (general Biology, Chemistry, Math and Physics) needed to understand the latest research in botany. It also allows a range of choice in upper level courses permitting students to tailor their degrees to their interests within plant biology. Students choose from upper level courses taught by distinguished faculty who have strong research orientation in biological sciences.

Career Prospects

Botany scientists who study plants that ranges from the smallest wild grass to the oldest towering trees. They could work with food crops or help wild plant populations recover from natural disasters. Education in botany can open the doors to many careers, most of which involve working with plants in some way. Botany degree generally focus heavily on Biology and Chemistry, but will likely to include courses in Mathematics, Geology and Geography. Degrees in ecology, environmental

sciences or agricultural sciences could also be useful for a botanical career. If you're wondering 'where do botanists work?' here is the answer: almost everywhere. Botanists some- times work indoors, in labs or greenhouses or outdoors, in agricultural fields or in forests and other wild areas around the world.

Possible Botany Careers

Aside from the botanist, there are many other types of careers that could be adopted after getting a degree in botany. Many of these careers will have a narrower focus, such as working specifically with food crops, so it may be smart to start developing a specialty in botany as soon as possible.

- Industrial Ecologist.
- Agricultural Plant Scientist
- Soil and Water Conservationist
- Horticulturist
- Plant Explorer
- Plant Biochemist

Admission Requirements

- (i) Intermediate or equivalent with Biology securing at least 45% marks in aggregate. In case of foreign qualification, equivalence from IBCC will be required.
- (ii) UCP admission test or HEC approved test.

Degree Requirements

Each candidate of BS Botany degree is required to complete 132 Cr. Hrs. with the CGPA of 2.0 on the scale of 4.0 as per the following detail:

Area	Cr. Hrs.
a) Compulsory	27
b) General	25
c) Foundation	32
d) Major	36
e) Elective	6
f) Project	6
Total	132

a) Botany Compulsory Courses (27 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Functional English	BOHU1003	3
Pakistan Studies	BOHU1013	3
Mathematics-I	BOMT1003	3
Communication Skills	BOHU1023	3
Islamic Studies/Ethics	BOHU1033	3
Introduction to Computer	BOCS1003	3
Technical Writing & Presentation Skill	BOHU2043	3
Biostatistics	BO2412	2
Biostatistics-Lab	BO2411	1
Geography	BO2713	3

b) Botany General Courses (25 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Principles of Animal Life-I	BO1202	2
Principles of Animal Life-I Lab	BO1201	1
Inorganic Chemistry	BO1302	2
Inorganic Chemistry-Lab	BO1301	1
Principles of Animal Life-II	BO1212	2
Principles of Animal Life-II Lab	BO1211	1
Introduction to Biotechnology	BO1403	3
Applied Chemistry	BO2312	2
Applied Chemistry-Lab	BO2311	1
Organic Chemistry	BO2323	3
Organic Chemistry-Lab	BO2321	1
Animal Form and Function	BO2222	2
Animal Form & Function-Lab	BO2221	1
Physical Chemistry	BO2332	2
Physical Chemistry-Lab	BO2331	1

c) Botany Foundation Courses (32 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Diversity of Plants	BO1703	3
Diversity of Plants-Lab	BO1701	1
Plant Systematics, Anatomy and Development	BO1503	3
Plant Systematics, Anatomy and Development Lab	BO1501	1
Cell Biology, Genetics and Evolution	BO2603	3
Cell Biology, Genetics and Evolution-Lab	BO2601	1
Plant Physiology and Ecology	BO2103	3
Plant Physiology & Ecology-Lab	BO2101	1
Biodiversity and Conservation	BO2723	3
Biodiversity & Conservation-Lab	BO2721	1
Bacteriology and Virology	BO3802	2
Bacteriology & Virology-Lab	BO3801	1
Diversity of Vascular Plants	BO3732	2
Diversity of Vascular Plants-Lab	BO3731	1
Plant Anatomy	BO3512	2
Plant Anatomy-Lab	BO3511	1
Plant Ecology-I	BO3742	2
Plant Ecology-I Lab	BO3741	1

d) Botany Major Courses (36 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Phycology and Bryology	BO3112	2
Phycology & Bryology-Lab	BO3111	1
Mycology and Plant Pathology	BO3122	2
Mycology & Plant Pathology-Lab	BO3121	1
Plant Systematics	BO3132	2

Plant Systematics-Lab	BO3131	1
Genetics-I	BO3612	2
Genetics-I Lab	BO3611	1
Plant Biochemistry-I	BO3342	2
Plant Biochemistry-I Lab	BO3341	1
Plant Physiology-I	BO3142	2
Plant Physiology-I Lab	BO3141	1
Molecular Biology	BO4522	2
Molecular Biology-Lab	BO4521	1
Plant Biochemistry-II	BO4352	2
Plant Biochemistry-II Lab	BO4351	1
Plant Ecology-II	BO4752	2
Plant Ecology-II Lab	BO4751	1
Plant Physiology-II	BO4152	2
Plant Physiology-II Lab	BO4151	1
Genetics-II	BO4622	2
Genetics-II Lab	BO4621	1
Environmental Biology	BO4762	2
Environmental Biology-Lab	BO4761	1

e) Botany Elective Courses (06 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Elective I	BO4xx2	2
Elective I Lab	BO4xx1	1
Elective II	BO4xx2	2
Elective II Lab	BO4xx1	1

The course list will be offered by the department

f) Research Project (06 Cr. Hrs.)

After the completion of 90 Cr. Hrs., the students are required to demonstrate their practical skills in the field of Botany by designing and implementing a research project worth 6 Cr. Hrs. The project shall be completed in two parts as given below:

Course Title	Code	Cr. Hrs.
Research Project I	BO4903	3
Research Project II	BO4913	3

Volunteer in Service (BO3000)

Each student is required to complete 65 hours of community work, usually after 4th semester which would be a prerequisite for the award of degree.

Program Duration

This is a four-year degree program comprising of 8 semesters. There will be a Fall and a Spring semester in each year. The summer semester will be utilized for internship or deficiency courses. The maximum duration to complete BS Botany degree is 7 years.

Scheme of Studies BS Botany

Semester-I (19 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
BOHU1003	Functional English	Compulsory	3
BOHU1013	Pakistan Studies	Compulsory	3
BOMT1003	Mathematics-I	Compulsory	3
BO1202	Principles of Animal Life-I	General	2
BO1201	Principles of Animal Life-I Lab	General Lab	1
BO1302	Inorganic Chemistry	General	2
BO1301	Inorganic Chemistry-Lab	General Lab	1
BO1703	Diversity of Plants	Foundation	3
BO1701	Diversity of Plants-Lab	Foundation Lab	1

Semester-II (19 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
BOHU1023	Communication Skills	Compulsory	3
BOHU1033	Islamic Studies/Ethics	Compulsory	3
BOCS1003	Introduction to Computer	Compulsory	3
BO1212	Principles of Animal Life-II	General	2
BO1211	Principles of Animal Life-II Lab	General Lab	1
BO1403	Introduction to Biotechnology	General	3
BO1503	Plant Systematics, Anatomy and Development	Foundation	3
BO1501	Plant Systematics, Anatomy and Development Lab	Foundation Lab	1

Semester-III (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
BOHU2043	Technical Writing & Presentation Skill	Compulsory	3
BO2412	Biostatistics	Compulsory	2
BO2411	Biostatistics-Lab	Compulsory Lab	1
BO2312	Applied Chemistry	General	2
BO2311	Applied Chemistry-Lab	General Lab	1
BO2323	Organic Chemistry	General	3
BO2321	Organic Chemistry-Lab	General Lab	1
BO2603	Cell Biology, Genetics and Evolution	Foundation	3
BO2601	Cell Biology, Genetics and Evolution-Lab	Foundation Lab	1

Scheme of Studies BS Botany

Semester-IV (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
BO2713	Geography	Compulsory	3
BO2222	Animal Form and Function	General	2
BO2221	Animal Form & Function-Lab	General Lab	1
BO2332	Physical Chemistry	General	2
BO2331	Physical Chemistry-Lab	General Lab	1
BO2103	Plant Physiology and Ecology	Foundation	3
BO2101	Plant Physiology & Ecology-Lab	Foundation Lab	1
BO2723	Biodiversity and Conservation	Foundation	3
BO2721	Biodiversity & Conservation-Lab	Foundation Lab	1

Semester-V (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
BO3802	Bacteriology and Virology	Foundation	2
BO3801	Bacteriology & Virology-Lab	Foundation Lab	1
BO3732	Diversity of Vascular Plants	Foundation	2
BO3731	Diversity of Vascular Plants-Lab	Foundation Lab	1
BO3112	Phycology and Bryology	Major	2
BO3111	Phycology & Bryology-Lab	Major Lab	1
BO3122	Mycology and Plant Pathology	Major	2
BO3121	Mycology & Plant Pathology-Lab	Major Lab	1
BO3132	Plant Systematics	Major	2
BO3131	Plant Systematics-Lab	Major Lab	1

Semester-VI (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
BO3512	Plant Anatomy	Foundation	2
BO3511	Plant Anatomy-Lab	Foundation Lab	1
BO3742	Plant Ecology-I	Foundation	2
BO3741	Plant Ecology-I Lab	Foundation Lab	1
BO3612	Genetics-I	Major	2
BO3611	Genetics-I Lab	Major Lab	1
BO3342	Plant Biochemistry-I	Major	2
BO3341	Plant Biochemistry-I Lab	Major Lab	1
BO3142	Plant Physiology-I	Major	2
BO3141	Plant Physiology-I Lab	Major Lab	1

Scheme of Studies BS Botany

Semester-VII (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
BO4522	Molecular Biology	Major	2
BO4521	Molecular Biology-Lab	Major Lab	1
BO4352	Plant Biochemistry-II	Major	2
BO4351	Plant Biochemistry-II Lab	Major Lab	1
BO4752	Plant Ecology-II	Major	2
BO4751	Plant Ecology-II Lab	Major Lab	1
BO4xx2	Elective-I	Elective	2
BO4xx1	Elective-I Lab	Elective Lab	1
BO4903	Research Project I	Project	3

Semester-VIII (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
BO4152	Plant Physiology-II	Major	2
BO4151	Plant Physiology-II Lab	Major Lab	1
BO4622	Genetics-II	Major	2
BO4621	Genetics-II Lab	Major Lab	1
BO4762	Environmental Biology	Major	2
BO4761	Environmental Biology-Lab	Major Lab	1
BOT4xx2	Elective-II	Elective	2
BOT4xx1	Elective-II Lab	Elective Lab	1
BO4913	Research Project II	Project	3

BS Physics

Our goal is to produce graduates who can function in an outstanding manner whether as academic scholar in universities, technical experts for the government and private sector, researchers in R & D organizations. In whatever capacity they serve, they will have a solid grounding in their field and will be equipped with strong critical and analytical abilities developed by program. As a Physics major, you will firstly develop a strong background in Mathematics and fundamentals of Physics. Later, you will tackle advanced level Physics courses in such challenging fields as optics, thermodynamics, quantum mechanics, theoretical mechanics, electrodynamics and solid-state physics.

Career Prospects

With a Bachelor's of Science degree in Physics, one can pursue a career in multiple fields of research and development, manufacturing, engineering, education, medicine and military. Recent students can take

benefit of the many research and training opportunities accessible to help prepare them for their chosen careers. The percentage of employees in graduates of the Bachelor of Physics is about 63.1%. While 36.9% of students of the Bachelor of Physics continue their graduate studies and research on national and international platforms. Senior employers who provide physicists to work with their organization are listed as follows:

- Education sector
- SUPARCO
- Atomic Energy Commission
- Clinical Scientist, Medical Physicists
- Meteorologist
- Geophysicist
- Astronomer
- Radiation protection practitioner
- Metallurgist
- Research scientist (Physical Sciences).

Admission Requirements

- (i) Intermediate or equivalent with Mathematics and Physics securing at least 45% marks in aggregate. In case of foreign qualification, equivalence from IBCC will be required.
- (ii) UCP admission test or HEC approved test.

Degree Requirements

Each candidate of BS Physics degree is required to complete 135 Cr. Hrs. with the CGPA of 2.00 on the scale of 4.00 as per the following detail:

Area	Cr. Hrs.
a) Compulsory Requirements	27
b) General Courses	21
c) Foundation Courses	24
d) Major Courses	48
e) Elective Courses	12
f) Research Project	03
Total	135

a) Compulsory Requirements (27 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Functional English	PYHU1013	3
Pakistan Studies	PYHU1023	3
Calculus I	PYMT1013	3
Communication Skills	PYHU1043	3
Islamic Studies/Ethics	PYHU1053	3
Calculus II	PYMT1023	3
Technical Writing & Presentation Skills	PYHU2063	3
Statistics	PYMT2033	3
Introduction to Computer	PYCS2023	3

b) General Courses (21 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Introduction to Sociology	PYHU1033	3
Physical Chemistry	PY1313	3
Differential Equations	PYMT2043	3
Computer Programming	PYCS2013	3
Linear Algebra	PYMT2053	3
Introduction to Psychology	PYHU2073	3
Environmental Physics	PY3513	3

c) Foundation Courses (24 Cr. Hrs.)

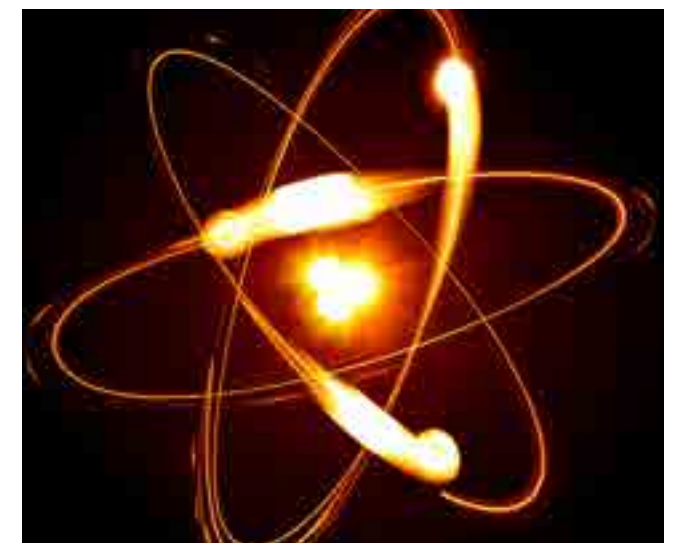
Course Title	Code	Cr. Hrs.
Mechanics	PY1114	4
Mechanics Lab	PY1111	1
Electricity & Magnetism	PY1214	4
Electricity & Magnetism Lab	PY1211	1
Waves & Oscillations	PY1123	3
Heat & Thermodynamics	PY2413	3
Heat & Thermodynamics Lab	PY2411	1
Modern Physics	PY2503	3
Optics	PY2613	3
Optics Lab	PY2611	1

d) Major Courses (48 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Mathematical Methods of Physics I	PY3523	3
Quantum Mechanics I	PY3133	3
Electronics I	PY3713	3
Electronics I Lab	PY3712	2
Statistical Mechanics	PY3143	3
Mathematical Methods of Physics II	PY3533	3
Atomic & Molecular Physics	PY3543	3
Atomic & Molecular Physics Lab	PY3542	2
Solid State Physics I	PY3553	3
Electronics II	PY3723	3
Electrodynamics I	PY3153	3
Solid State Physics II	PY4563	3
Classical Mechanics	PY4163	3
Electrodynamics II	PY4173	3
Nuclear Physics	PY4573	3
Quantum Mechanics II	PY4183	3
Advanced Experiment Lab	PY4xx2	2

e) Elective Courses (12 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Elective I	PY4xx3	3
Elective II	PY4xx3	3
Elective III	PY4xx3	3
Elective IV	PY4xx3	3



Students can take 4 courses from the given list

Course Title	Code	Cr. Hrs.
Plasma Physics	PY4813	3
Quantum Field Theory	PY4823	3
Electronic Materials & Devices	PY4733	3
Methods of Experimental Physics	PY4583	3
Digital Electronics	PY4743	3
Fluid Dynamics	PY4193	3
Environmental Physics	PY4593	3
Lasers	PY4623	3
Introduction to Photonics	PY4833	3
Introduction to Quantum Computing	PY4843	3
Laser Engineering	PY4633	3
Introduction to Materials Science	PY4323	3
Quantum Information Theory	PY4853	3
Experimental Techniques in Particle & Nuclear Physics	PY4863	3
Computer Simulation in Physics	PY4503	3
Particle Physics	PY4873	3
Introduction to Nano Science & Nano Technology	PY4883	3
Surface Sciences	PY4743	3
Computational Physics	PYMT4063	3

f) Research Project (03 Cr. Hrs.)

After the completion of 90 Cr. Hrs., the students are required to demonstrate their practical skills in the field of Physics by designing and implementing a research project worth 3 Cr. Hrs.

Course Title	Code	Cr. Hrs.
Research Project	PY4903	3

Volunteer Service (PY3000)

Each student is required to complete 65 hours community work during the program, which would be a pre requisite for the award of degree.

Program Duration

This is a four years degree program comprising of 8 semesters. There is a Fall and a Spring semester in each year. The summer semester is utilized for improve / repeat / deficiency courses. The maximum duration to complete the BS Physics program is 7 years.

Scheme of Studies BS Physics

Semester-I (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
PYHU1013	Functional English	Compulsory	3
PYHU1023	Pakistan Studies	Compulsory	3
PYMT1013	Calculus I	Compulsory	3
PYHU1033	Introduction to Sociology	General	3
PY1114	Mechanics	Foundation	4
PY1111	Mechanics Lab	Foundation	1

Semester-II (20 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
PYHU1043	Communication Skills	Compulsory	3
PYHU1053	Islamic Studies/Ethics	Compulsory	3
PYMT1023	Calculus II	Compulsory	3
PY1214	Electricity and Magnetism	Foundation	4
PY1211	Electricity and Magnetism Lab	Foundation	1
PY1313	Physical Chemistry	General	3
PY1123	Waves and Oscillation	Foundation	3

Semester-III (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
PYHU2063	Technical Writing & Presentation Skills	Compulsory	3
PYMT2033	Statistics	Compulsory	3
PYMT2043	Differential Equations	General	3
PYCS2013	Computer Programming	General	3
PY2413	Heat & Thermodynamics	Foundation	3
PY2411	Heat & Thermodynamics Lab	Foundation	1

Semester-IV (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
PYMT2053	Linear Algebra	General	3
PYHU2073	Introduction to Psychology	General	3
PYCS2023	Introduction to Computer	Compulsory	3
PY2503	Modern Physics	Foundation	3
PY2613	Optics	Foundation	3
PY2611	Optics Lab	Foundation	1



Scheme of Studies BS Physics

Semester-V (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
PY3513	Environmental Physics	General	3
PY3523	Mathematical Methods of Physics I	Major	3
PY3133	Quantum Mechanics I	Major	3
PY3713	Electronics I	Major	3
PY3712	Electronics I Lab	Major	2
PY3143	Statistical Mechanics	Major	3

Semester-VI (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
PY3533	Mathematical Methods of Physics II	Major	3
PY3543	Atomic & Molecular Physics	Major	3
PY3542	Atomic & Molecular Physics Lab	Major	2
PY3553	Solid State Physics I	Major	3
PY3723	Electronics II	Major	3
PY3153	Electrodynamics I	Major	3

Semester-VII (17 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
PY4563	Solid State Physics II	Major	3
PY4163	Classical Mechanics	Major	3
PY4173	Electrodynamics II	Major	3
PY4xx2	Advanced Experiment Lab	Major	2
PY4573	Nuclear Physics	Major	3
PY4xx3	Elective I	Elective	3

Semester-VIII (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
PY4183	Quantum Mechanics II	Major	3
PY4903	Research Project	Research Project	3
PY4xx3	Elective II	Elective	3
PY4xx3	Elective III	Elective	3
PY4xx3	Elective IV	Elective	3

BS Mathematics

Mathematicians play a vital role in every field. It is the main pillar of every subject. In Faculty of Sciences, we provide state of the art facilities to graduates who opt to study Mathematics. The understanding in this field helps to develop critical thinking and problem solving abilities in students.

Career Prospects

Mathematics is basically the study of quantity, structure, and change. Those who study Mathematics are known as Mathematics Experts. Mathematicians use variables, products, quantities, and sequences to study number theory and do mathematical analysis. A mathematician must have an analytical mindset to distinguish various patterns, develop research models, and assess demographic trends. Have technical skills when using technology, such as data scanners and graphing calculators. If you create such abilities within yourself, there are many opportunities

waiting for you. At present, there is a large demand for mathematicians in the government and private districts due to increasing technological advances and education awareness. Because of the wide application of Mathematics in various fields, many oil and nuclear industries, operational research companies, engineering, and pharmaceutical companies employ mathematicians.

The fields of space science and astronomy also employ mathematicians along with IT and insurance agents. If you are good at coding and decoding, encryption, and computer skills, there are opportunities in cybersecurity areas. You can work as a cryptographer or a data security analyst. As a mathematician, you can also work in an educational institution as a postsecondary teacher.

Admission Requirements

- Intermediate or equivalent with Mathematics securing at least 45% marks in aggregate. In case of foreign qualification, equivalence from IBCC will be required.
- UCP admission test or HEC approved test.

Degree Requirements

Each candidate of BS Mathematics degree is required to complete 130 Cr. Hrs. with the CGPA of 2.0 on the scale of 4.0 as per the following detail:

	Area	Cr. Hrs.
a)	Compulsory	27
b)	General	21
c)	Foundation	33
d)	Major	34
e)	Elective	12
f)	Project	3
Total		130



a) Mathematics Compulsory Courses (27 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Elements of Set Theory and Mathematical Logic	MT1403	3
Functional English	MTHU1003	3
Islamic Studies/Ethics	MTHU1013	3
Introduction to Computer	MTCS1003	3
Communication Skills	MTHU1023	3
Pakistan Studies	MTHU1033	3
Technical Writing and Presentation Skills	MTHU4053	3
Discrete Mathematics	MT2343	3
Foreign Language (Chinese)	MTEL2003	3

b) Mathematics General Courses (21 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Mechanics	MT1702	2
Lab (Mechanics)	MT1701	1
Computer Programming	MTCS1013	3
Waves and Oscillation	MTPY1002	2
Lab (Waves and Oscillation)	MTPY1001	1
Statistics	MT1103	3
Introduction to Psychology	MTHU2043	3
Software Packages	MTCS2023	3
Introduction to Sociology	MTHU2063	3

c) Mathematics Foundation Courses (33 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Calculus I	MT1304	4
Calculus II	MT1313	3
Algebra I (Group Theory)	MT2203	3
Calculus III	MT2324	4
Affine and Euclidean Geometry	MT2333	3
Linear Algebra	MT2214	4
Ordinary Differential Equations	MT3513	3
Algebra II (Rings and Fields)	MT3223	3
Complex Analysis	MT3613	3
Integral Equations	MT4533	3

d) Mathematics Major Courses (34 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Topology	MT3003	3
Differential Geometry & Tensor Analysis	MT3503	3
Real Analysis I	MT3603	3
Classical Mechanics (MATH)	MT3713	3
Partial Differential Equations	MT3523	3
Functional Analysis	MT3623	3
Real Analysis II	MT3633	3
Numerical Analysis	MT4644	4

Course Title	Code	Cr. Hrs.
Number Theory	MT4413	3
Mathematical Methods	MT4013	3
Probability Theory	MT4113	3

e) Mathematics Elective Courses (12 Cr. Hrs.)

Course Title	Code	Cr. Hrs.
Elective I	MT4xx3	3
Elective II	MT4xx3	3
Elective III	MT4xx3	3
Elective IV	MT4xx3	3

Elective Courses to be offered (Student take 12 credit hours from Elective Courses)

Course Title	Code	Cr. Hrs.
Advance Group Theory I	MT4423	3
Quantum Mechanics I	MT4723	3
Analytical Dynamics	MT4803	3
Operations Research I	MT4023	3
Theory of Approximation and Splines I	MT4813	3
Advanced Functional Analysis	MT4653	3
Fluid Mechanics I	MT4733	3
Special Theory of Relativity	MTPY4013	3
Advance Group Theory II	MT4433	3
Quantum Mechanics II	MT4743	3

Course Title	Code	Cr. Hrs.
General Theory of Relativity	MTPY4023	3
Operations Research II	MT4033	3
Theory of Approximation and Splines II	MT4823	3
Fluid Mechanics II	MT4753	3
Measure Theory and Lebesgue Integration	MT4543	3
Methods of Mathematical Physics	MT4043	3

f) Research Project (03 Cr. Hrs.)

After the completion of 90 Cr. Hrs., the students are required to demonstrate their practical skills in the field of Mathematics by designing and implementing a research project worth 3 Cr. Hrs.

Course Title	Code	Cr. Hrs.
Research Project	MT4903	3

Volunteer in Service (MT3000)

Each student is required to complete 65 hours of community work, usually after 4th semester which would be a prerequisite for the award of degree.

Program Duration

This is a four-year degree program comprising of 8 semesters. There will be a Fall and a Spring semester in each year. The summer semester will be utilized for intern-ship / improvement or deficiency courses. The maximum duration to complete BS Mathematics degree is 7 years.



Scheme of Studies BS Mathematics

Semester-I (19 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MT1304	Calculus I	Foundation	4
MT1403	Elements of Set Theory and Mathematical Logic	Compulsory	3
MTHU1003	Functional English	Compulsory	3
MTHU1013	Islamic Studies/Ethics	Compulsory	3
MTCS1003	Introduction to Computer	Compulsory	3
MT1702	Mechanics	General	2
MT1701	Lab (Mechanics)	General	1

Semester-II (18 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MT1313	Calculus II	Foundation	3
MTHU1023	Communication Skills	Compulsory	3
MTHU1033	Pakistan Studies	Compulsory	3
MTCS1013	Computer Programming	General	3
MTPY1002	Waves and Oscillation	General	2
MTPY1001	Lab (Waves and Oscillation)	General	1
MT1103	Statistics	General	3

Semester-III (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MTHU4053	Technical Writing and Presentation Skills	Compulsory	3
MT2203	Algebra I (Group Theory)	Foundation	3
MT2324	Calculus III	Foundation	4
MTHU2043	Introduction to Psychology	General	3
MTCS2023	Software Packages	General	3

Semester-IV (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MT2333	Affine and Euclidean Geometry	Foundation	3
MT2214	Linear Algebra	Foundation	4
MTHU2063	Introduction to Sociology	General	3
MT2343	Discrete Mathematics	Compulsory	3
MTEL2003	Foreign Language (Chinese)	Compulsory	3

Scheme of Studies BS Physics

Semester-V (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MT3003	Topology	Major	3
MT3503	Differential Geometry & Tensor Analysis	Major	3
MT3603	Real Analysis I	Major	3
MT3513	Ordinary Differential Equations	Foundation	3
MT3223	Algebra II (Rings and Fields)	Foundation	3

Semester-VI (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MT3613	Complex Analysis	Foundation	3
MT3713	Classical Mechanics (MATH)	Major	3
MT3523	Partial Differential Equations	Major	3
MT3623	Functional Analysis	Major	3
MT3633	Real Analysis II	Major	3

Semester-VII (16 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MT4644	Numerical Analysis	Major	4
MT4413	Number Theory	Major	3
MT4013	Mathematical Methods	Major	3
MT4xx3	Elective I	Elective	3
MT4xx3	Elective II	Elective	3

Semester-VIII (15 Cr. Hrs.)

Course Code	Course Title	Category	Cr. Hrs.
MT4113	Probability Theory	Major	3
MT4533	Integral Equations	Foundation	3
MT4xx3	Elective III	Elective	3
MT4xx3	Elective IV	Elective	3
MT4903	Project	Project	3