PROSPECTUS

FACULTY OF LIFE SCIENCES & INFORMATICS

Global HUB for SDG8
UNITED NATIONS academic impact
2018-2021-2024

Balochistan University of Information Technology, Engineering and Management Sciences

CONTENTS

Message from Vice Chancellor

I have great pleasure in welcoming you to the BUITEMS. We pride ourselves on being a university for delivering quality education that is supported by excellent research faculty and infrastructure in the region. We aim to produce new knowledge through research and practice that has local, regional and global relevance and impact. At BUITEMS we mix 'learning' with an emphasis on real-world experience and 'Future of Work' outlook. For industry our laboratories are equipped with the latest technologies. For businesses and entities our academic faculty offer a range of high-quality research, consulting and short courses. Our class room teaching is informed by research and global practices. We support student learning with guest lectures, workshops, training courses, career seminars and employability skills. Therefore, our graduates possess global vision and are able to provide solutions for business, social and industry problems. We offer excellent national level sport facilities, high quality accommodation and transport services. Our proximity to the Quetta Airport enhances our connections and access to national and global opportunities. Under the guidance of the Honorable Governor of Balochistan as the Chancellor, we take pride in delivering support and guidance to enable our students to become successful professionals and global citizens.

I look forward to working with you.

Khalid Hafeez PhD

Professor of AI & Digital Transformation

Fellow Royal Society of Arts (RSA-UK), Fellow Chartered Management Institute (CMi-UK), Senior Fellow Higher Education Academy (SFHEA -UK), Certified Six Sigma Master Black Belt (SSMBB-US), Certified European Foundation of Quality Management (EFQM-Brussels- Belgium), Certified Lean systems and Process Manager (Herrington Institute -US), Certified Project Manager (Herrington Institute -US), Certified Natural Linguistic Programming (NLP -UK)

Message from the Dean

We are in an era of science where erstwhile boundaries of academic disciplines are blurred. Interdisciplinary research and education are, therefore, the slogan of the day. Simultaneously, we have been observing a paradigm shift from basic research to applied research. To thrive in this era of transformations, we have to keep pace with the changes occurring globally in various disciplines of life sciences. The situation necessitates interdisciplinary research and teaching that is based on problems of our society. To be able to do so, inter and intra-university collaborations are needed. Today, the knowledge is meant to be spread not concealed. I, therefore, expect that our faculty and students will direct their energies in this direction to stay relevant in future. Our priorities will be directing our efforts towards finding a cure for deadly diseases, increasing crop yield, providing a safer and cleaner form of energy and promoting awareness about the importance of biodiversity and climate change.

Thank you for considering our programs

FACULTY OF LIFE SCIENCES & INFORMATICS

VISION

Empowering excellence in life sciences through accessible quality education, impactful innovative research, and meaningful industry partnerships.

MISSION

Our mission at the Faculty of Life Sciences is to nurture a new generation of individuals empowered with theoretical knowledge, technical expertise, and a commitment to making meaningful contributions to society. Through quality education and impactful research, we aim to prepare students who are capable of driving positive change and creating innovative solutions to pressing global issues, such as climate change, food security and safety, health, energy, water, and the environment.

PROGRAMS OFFERED

Department of Biotechnology

1. Bachelor of Science in Biotechnology (BS)
2. Master of Science in Biotechnology (MS)
3. Doctor of Philosophy in Biotechnology (PhD)

Department of Microbiology

1. Bachelor of Science in Microbiology (BS)
2. Master of Science in Microbiology (MS)

Department of Environmental Science

1. Bachelor of Science in Environmental Science (BS)
2. Master of Science in Environmental Science (MS)
3. Master of Science in Environmental Management and Policy
4. Doctor of Philosophy in Environmental Management and Policy
5. Doctor of Philosophy in Environmental Sciences

DEPARTMENT OF BIOTECHNOLOGY

DEPARTMENT OF BIOTECHNOLOGY

Introduction

Biotechnology is based on biology, especially when applied in agriculture, food and medicine. The term "biotechnology" refers to the use of biological systems, living organisms or their products to make or modify products or processes for the betterment of mankind, human health and the environment. Prehistoric biotechnologists did this as they used yeast cells to raise bread dough and to ferment alcoholic beverages, bacterial cells to make cheese and yogurt while they bred their strong, productive animals to make even stronger and more productive offspring. Modern Biotechnology is related with the use of genetically altered microorganisms such as E. coli or yeast for the production of substances like insulin or antibiotics. It is also related with transgenic animals and transgenic plants, such as Bt corn or Bt cotton. Biotechnology also corresponds with landmark breakthroughs in new medical therapies to treat diabetes, hepatitis B, hepatitis C, cancers, arthritis, hemophilia, bone fractures, multiple sclerosis, cardiovascular as well as molecular diagnostic devices. Traditional pharmaceutical drugs are small molecules that treat the symptoms of a disease or illness - one molecule directed at a single target. While on the other hand Biopharmaceuticals are large biological molecules which target the underlying mechanisms and pathways and drug responses.

Scope

Biotechnology may be as old as human civilization but modern biotechnology is less than three decades old. Traditional Biotechnology that led to the developmental processes for producing products like yogurt, vinegar, alcohol and cheese was entirely empirical and there was no understanding of the mechanisms that led to the product. In modern biotechnology, we use the in-depth understanding of molecular techniques that we have acquired in the last five decades. In case of an established product, the new biotechnological process is cheaper and better in many respects than the earlier processes. Today's biotechnology consists of many new areas; each area being characterized by the use of a different set of technologies like genetic engineering, gene therapy, immune-technologies, tissue culture, stem cell techniques, enzyme engineering and technology, nutraceuticals, new drug-delivery systems, production of useful materials, DNA vaccines, biosensor, bioremediation, nanobiotechnology and so many others.

Degree Courses Offered

1. BS (Biotechnology)

Pre-requisite: Intermediate (Pre-medical/Pre-engineering or equivalent with 45% marks)

Scheme of Study for 4-year Bachelor of Science (BS) in Biotechnology

Semester 1

S. No	Course Code	Course Titles		Credit Hours
1	BIOTECH-203	Fundamentals of Biotechnology	(G)	3 (3+0)
2	BIOL- 301	Cell Biology	(F)	3 (2+1)
3	CHE-109	Physical Chemistry	(G)	3 (3+0)
4	HUM-163	Functional English	(C)	3 (3+0)
5	HUM-102	Pakistan Studies	(C)	2 (2+0)
6	MATHA-114	Mathematics-I (pre-calculus)	(C)	3 (3+0)
		Total Credit Hours		**17**

Semester 2

S. No	Course Code	Course Titles		Credit Hours
1	HUM-268	Communication Skills	(C)	3 (3+0)
2	HUM-101/ HUM-112	Islamic Studies / Ethics	(C)	2 (2+0)
3	MATHA-104	Biomathematics	(C)	3 (3+0)
4	CHE-108	Inorganic Chemistry	(G)	3 (2+1)
5	CS-104	Fundamentals of Computer	(G)	3 (2+1)
6	MICRBIOL- 301	Microbiology	(F)	3 (2+1)
		Total Credit Hours		**17**

Semester 3

S. No	Course Code	Course Titles		Credit Hours
1	HUM-265	Technical Writing and Presentation Skills	(C)	3 (3+0)
2	PHY-206	Biological Physics	(G)	3 (3+0)
3	CHE-107	Organic Chemistry	(G)	3 (2+1)
4	STAT-303	Probability and Biostatistics	(F)	3 (3+0)
5	GENET- 301	Genetics	(F)	3 (2+1)
6	RES-410	Philosophy and Logical Reasoning	(F)	3 (3+0)
		Total Credit Hours		**18**

Semester 4

S. No	Course Code	Course Titles		Credit Hours
1	IMMUNOL-302	Immunology	(F)	3 (2+1)
2	BIOINFO-202	Introduction to Bioinformatics	(M)	3 (2+1)
3	CHE-301	Analytical Chemistry & Instrumentation	(F)	3 (2+1)
4	BIOCHEM-202	Biochemistry-I	(F)	3 (2+1)
5	MOLBIOL-301	Molecular Biology	(F)	3 (2+1)
6	BIOTECH-302	Biosafety and Bioethics	(C)	3 (2+1)
		Total Credit Hours		**18**

Semester 5

S. No	Course Code	Course Titles		Credit Hours
1	BIOL-403	Ecology, Biodiversity and Evolution	(G)	3 (2+1)
2	BIOCHEM-404	Biochemistry-II	(F)	3 (2+1)
3	MOLBIOL-403	Methods in Molecular Biology	(F)	3 (1+2)
4	BIOCHE-302	Principles of Biochemical Engineering	(M)	3 (2+1)
5	ENVIRON-443	Environmental Impact Assessment	(M)	3 (2+1)
6	BIOL-404	Biological Resources & Conservation	(F)	3 (3+0)
		Total Credit Hours		**18**

Semester 6

S. No	Course Code	Course Titles		Credit Hours
1	BIOTECH-404	Genomics and Proteomics	(M)	3 (2+1)
2	BIOTECH-320	Microbial Biotechnology	(F)	3 (2+1)
3	BIOTECH- 402	Plant Biotechnology	(M)	3 (2+1)
4	BIOTECH-433	Food Biotechnology	(M)	3 (2+1)
5	METHOD-304	Research Methodology	(M)	3 (3+0)
		Total Credit Hours		**15**

Semester 7

S. No	Course Code	Course Titles		Credit Hours
1	BIOTECH-321	Bio-entrepreneurship	(M)	3 (1+2)
2	BIOTECH-310	Health Biotechnology	(M)	3 (2+1)
3	BIOTECH-407	Environment Biotechnology	(M)	3 (2+1)
4	BIOTECH-316	Seminar-I	(M)	1 (1+0)
5		Elective-I	(E)	3
6	BIOTECH-434	Project-I	(L)	3(0+3)
		Total Credit Hours		**16**

Semester 8

S. No	Course Code	Course Titles		Credit Hours
1	BIOTECH-302	Industrial Biotechnology	(M)	3 (2+1)
2	BIOTECH-429	SEMINAR-II	(M)	1(1+0)
3		Elective-II	(E)	3
4		ELECTIVE-III	(E)	3
5		ELECTIVE-IV	(E)	3
6	BIOTECH-435	Project-II	(L)	3(0+3)
		Total Credit Hours		**16**

*Credit hours included in semester 8

Total Credit Hours: 135

List of Elective Courses for BS Biotechnology

S. No	Course Code	Course Titles	Credit Hours
1	BIOTECH-313	Animal Biotechnology	3 (2+1)
2	BIOTECH-315	Marine Biotechnology	3 (2+1)
3	RADBIOL	Radiobiology	3 (3+0)
4	ENVIRON-403	Hospital Waste Management	3 (2+1)
5	ENVIRON-404	Water and Waste-water Treatment	3 (2+1)
6	BIOTECH-426	Nano Biotechnology	3 (3+0)
7	BIOTECH-319	Fungal Biotechnology	3 (2+1)
8	BIOTECH-317	Pharmaceutical Biotechnology	3 (3+0)
9	BIOTECH-427	Biosensors	3 (3+0))
10	BIOTECH-428	Biofuels and Bio refineries	3 (3+0)
11	MOLBIOL-404	Molecular Diagnostics	3 (2+1)
12	BIOTECH-201	Cell and Tissue Culture	3 (2+1)
13	VIROL	Virology	3 (3+0)
14	BIOTECH-314	Fermentation Biotechnology	3 (2+1)
15	BIOTECH-3XX	Epidemiology	3(3+0)
16	BIOTECH-4XX	Academia Industry Collaboration	3(2+1)
17	BIOTECH-3XX	Leadership Skills	3(3+0)
18	BIOTECH-3XX	Synthetic Biology	3(3+0)

2. MS (Biotechnology)

Pre-requisite: BS Biotechnology or equivalent degree with CGPA ≥ 2.0 or Minimum 16 years of education in life sciences discipline with 50% marks.

Scheme of Study for Master of Science (MS) in Biotechnology

Semester 1

S. No	Course Code	Course Titles	Credit Hours
1	MOLBIOL- 601	Advances in Molecular Biology	3+0
2	BIOCHEM - 639	Research Methods in Biotechnology	3+0
3	-	Elective - I (From the approved List)	3+0
4	-	Elective - II (From the approved List)	3+0
		Total Credit Hours	**12**

Semester 2

S. No	Course Code	Course Titles	Credit Hours
1	BIOTECH - 617	Developments in rDNA Technology	3+0
2	STAT- 501	Biostatistics & Laboratory Mathematics	3+0
3	-	Elective – III (From the approved List)	3+0
4	-	Elective – IV (From the approved List)	3+0
		Total Credit Hours	**12**

Semester 3

S. No	Course Code	Course Titles	Credit Hours
1	THESIS-601	Research & Thesis "Research and Thesis work will continue in the Third semester"	*06
		Total Credit Hours	***06**

Semester 4

S. No	Course Code	Course Titles	Credit Hours
1	THESIS-601	Research & Thesis "Research and Thesis work will continue in the fourth semester"	06
		Total Credit Hours	**06**

Total Credit Hours: 30

Number of credit hours required for MS Biotechnology Program

MS Degree	Credit Hours
Course Work	24
Thesis	06
Total	30

List of Core Courses for MS

No	Course Code	Course Titles	Credit Hours
1	MOLBIOL- 601	Advances in Molecular Biology	3+0
2	BIOCHEM - 639	Research Methods in Biotechnology	3+0
3	BIOTECH - 617	Developments in rDNA Technology	3+0
4	STAT-501	Biostatistics & Laboratory Mathematics	3+0

List of Elective Courses for MS

No	Stream-I	Human Genetics	
	Course Code	**Course Titles**	**Credit Hours**
1	BIOTECH- 602	Modern Biotechnology: Principles & Applications	3+0
2	BIOTECH-504	Bioethics, Biosecurity, Biosafety	3+0
3	MOLBIOL-607	Advances in Cell and Molecular Biology	3+0
4	MOLBIOL-608	Recent trends in Molecular Diagnostics	3+0
5	GENET-601	Advances in Molecular Genetics	3+0
6	BIOCHEM-503	Advances in Protein Chemistry	3+0
7	BIOTECH-629	Advances in Animal Biotechnology	3+0
8	BIOL-501	Advances in Biosensor Technologies	3+0
9	MOLBIOL-604	Forensic Sciences	3+0
10	BIOTECH-630	Advances in Animal Cell Culture	3+0
11	BIOCHEM-604	Advances Biochemistry	3+0
12	BIOL-503	Cellular Signaling	3+0
13	BIOTECH-634	Advances in Health Biotechnology	3+0
14	BIOTECH-502	Advances in Vaccine Research	3+0
15	BIOTECH-514	Molecular Systematics	3+0
16	MICRBIOL-525	Pathology	3+0
17	PHYSIOL-501	Animal Physiology	3+0
18	BIOCHEM-604	Advances Biochemistry	3+0
No	**Stream-II**	**Plant Biotechnology**	
	Course Code	**Course Titles**	**Credit Hours**
1	BIOTECH-631	Advances in Environmental Biotechnology	3+0
2	BIOTECH-508	Biotechnology Law & Regulation	3+0
3	MOLBIOL-609	Molecular Basis of Plant Development	3+0
4	BIOCHEM-504	Metabolic Pathways in Plants	3+0
5	MOLBIOL-605	Regulation of Gene Expression	3+0
6	BIOL-504	Molecular Evolution	3+0
7	BIOTECH-513	Molecular Basis of Plant Breeding	3+0
8	BIOTECH-633	Fungal Biotechnology	3+0
9	BIOTECH-636	Advances in Plant Biotechnology	3+0
10	BIOTECH-628	Advances in Agriculture Biotechnology	3+0
11	BIOTECH-503	Applications of Nano biotechnology	3+0
12	BIOTECH-637	Advances in Plant Tissue Culture	3+0
13	BIOTECH-510	Medicinal Plant Biotechnology	3+0

List of Elective Courses for MS

14	BIOTECH-505	Biopharming in Plants, Principles and Techniques	3+0
15	BIOTECH-638	Advances in Proteomics	3+0
16	GENOMICS-601	Advances in Genomics	3+0
17	BIOTECH-512	Microbial Enzyme Technology	3+0
18	BIOL-502	Biological Safety and Risk Management	3+0
19	MICRBIOL-527	Plant Pathology	3+0
20	BIOTECH-621	Plant Microbe Interaction	3+0
No	**Stream-III**	**Bioinformatics**	
	Course Code	**Course Titles**	**Credit Hours**
1	BIOINFO-602	Advances in Bioinformatics	3+0
No	**Stream-IV**	**Industrial Biotechnology**	
	Course Code	**Course Titles**	**Credit Hours**
1	BIOTECH-506	Bioprocess Technology	3+0
2	GENOMICS-602	Advances in Pharmacogenomics	3+0
3	PHY-503	Biophysics	3+0
4	BIOTECH-632	Advances in Fermentation Technology	3+0
5	IMMUNOL-601	Advances in Immunology	3+0
6	MICRBIOL-501	Advances in Microbiology	3+0
7	GENET-501	Advances in Microbial Genetics	3+0
8	BIOCHEM-5XX	Recent trends in Biochemical Engineering	3+0
9	BIOTECH-515	Protein Engineering and Enzyme Technology	3+0
10	BIOTECH-507	Bioremediation and biodegradation	3+0
11	BIOTECH-509	Biotechnology of Nonrenewable Resources	3+0
12	BIOTECH-511	Metabolic Engineering and Biofuels	3+0

3. PhD (Biotechnology)

Pre-requisite: MS Biotechnology or equivalent degree in Life Sciences discipline with CGPA ≥ 3.0 or 70% marks

Scheme of Study for Doctor of Philosophy (PhD) in Biotechnology

Semester 1

No	Course Code	Name of Subject	Credit Hours
1	From the Elective list	Elective – I	3+0
2	From the Elective list	Elective – II	3+0
3	From the Elective list	Elective - III	3+0
		Total	**9**

Semester 2

No	Course Code	Name of Subject	Credit Hours
1	From the Elective list	Elective - IV	3+0
2	From the Elective list	Elective - V	3+0
3	From the Elective list	Elective - VI	3+0
		Total	**9**

Semester 3-8

No	Course Code	Name of Subject	Credit Hours
1	DSS-990	Research & Thesis "Research and Thesis work will continue till the 8th semester"	Non-credited
		Total	**18**

Total Credit Hours: 18

Summary for PhD program in Biotechnology

PhD Degree	Credit Hours
Course Work	18
Thesis	Non Credit Hr.
Total	**18**

List of Elective Courses for PhD

No	Stream-I	Human Genetics	
	Course Code	Course Titles	Credit Hours
1	METHOD-701	Research Methodology	3+0
2	STAT-702	Biostatistics	3+0
3	EPIDEMO-701	Epidemiology	3+0
4	BIOTECH-706	Diagnostics	3+0
5	GENOMICS-801	Gene Microarray	3+0
6	GENOMICS-702	Microarray Technology	3+0
7	BIOTECH-811	Contemporary Animal Biotechnology	3+0
8	GENET-802	Protein Microarray	3+0
9	BIOTECH-813	Advanced Health Biotechnology	3+0
10	BIOTECH-814	Advance Research Reading-III	3+0
11	BIOTECH-807	Research Specialization-I	3+0
12	BIOTECH-808	Research Specialization-II	3+0
13	GENET-803	Transcriptomics	3+0
14	MOLBIOL-701	Transgenicity & Applications	3+0
15	BIOTECH-809	Research Specialization-III	3+0
16	EPIDEOM-801	Molecular Epidemiology of Hepatitis	3+0
17	GENET-804	Gene Expression and Replication of Hepatitis Virus	3+0
18	GENET-805	Genetics Diversity of Hepatitis Virus	3+0
19	MOLBIOL-801	Stem cell Biology	3+0
20	GENET-804	Genetic Disorders	3+0
21	BIOTECH-831	Cancer Biology	3+0
22	MOLBIOL-802	Antisense RNA technology	3+0
23	GENET-701	Epigenetics	3+0
24	BIOINFO-703	Computational Biology	3+0
25	BIOCHEM-702	Drug Development	3+0
26	BIOCHEM-703	Drug Metabolism	3+0
No	**Stream-II**	**Plant Biotechnology**	
	Course Code	**Course Titles**	**Credit Hours**
1	BIOTECH-707	Advances in Fungal Biotechnology	3+0
2	NUTR-802	Edible Oil Seed & Health Nutrition	3+0
3	MICRBIOL-801	Microbial Genetics	3+0
4	BIOTECH-808	Plant Biotechnology	3+0

List of Elective Courses for PhD

6	BIOTECH-810	Contemporary Plant Biotechnology	3+0
7	BIOTECH-812	Contemporary Agriculture Biotechnology	3+0
8	BIOL-801	Biology of Oil Seeds & Nutrition	3+0
No	Stream-III	Bioinformatics	
	Course Code	Course Titles	Credit Hours
1	BIOINFO-702	Agriculture Bioinformatics	3+0
2	BIOINFO-801	Current Trends in Bioinformatics	3+0
No	**Stream-IV**	**Industrial Biotechnology**	
	Course Code	**Course Titles**	**Credit Hours**
1	BIOTECH-704	Biofuel and Bio refinery	3+0
2	BIOL-701	Radiobiology	3+0
3	BIOTECH-705	Biomaterial	3+0
4	BIOTECH-708	Industrial Biotechnology	3+0
5	BIOTECH-709	Marine Biotechnology	3+0
6	BIOTECH-710	Pharmaceutical Biotechnology	3+0
7	BIOINFO-802	Biomedical Informatics	3+0
8	BIOTECH-711	Waste Management	3+0
9	BIOTECH-712	Water and Waste Water Treatment	3+0
10	BIOTECH-802	Nano biotechnology	3+0
11	BIOTECH-807	Bioremediation	3+0
12	ELE-731	Bioelectronics & Biosensor	3+0

FACULTY PROFILE

Department of Biotechnology

FACULTY PROFILE (Department of Biotechnology)

Prof. Dr. Nazeer Ahmed
Dean/Professor

Prof. Dr. Nazeer Ahmed is working as Dean FLS&I and Professor at the Department of Biotechnology, BUITEMS, Quetta. His research focused on the Plant Molecular Physiology, DNA Based Biodiversity Studies and Molecular phylogenetic Analysis. He has published 30 articles with impact factor more than 20 and he has published one book chapter Auxins and Cytokinins in Plant Biology in Springer. He has co-supervised 02 Phd scholars and 17 MS. Currently, a total of 04 PhD scholars and 02 MS students are under his supervision. Dr Nazeer has leading the scientific community in Pakistan launched the national initiative, Pakistan Barcode of Life (PakBOL) on April 26, 2019 for this purpose. In recognition of the efforts of Dr Nazeer in the field of DNA Barcoding, he has been nominated member Scientific Steering Committee of International Barcode of Life (iBOL) consortium. His achievements in the field of DNA Barcoding including 300 plant species from Juniper and Chilghoza forests of Balochistan, Barcoded 17 breeds of sheep and goat of Balochistan, Utilizing metabarcoding technique, 2380 arthropod species of Quetta were reported.

Prof. Dr. Muhammad Saeed
Professor

Professor Mohammad Saeed did his Masters' in Botany from University of Balochistan in 1987 and PhD from Department of Botany, University of Athens, Republic of Greece in 2000, on eco-physiology of seed germination of Pinus species of Pakistan. He investigated the effect of light and temperature regimes and the role of phytochrome in seed germination of Pines. Techniques to break seed dormancy, seed viability testing and seed storage requirements have also been within the scope of his studies. He has also explored unconventional plant propagation methods i.e. tissue culture on P. Gerardiana. His areas of interests are seed germination of ecologically and economically important indigenous plants of Balochistan especially Juniper and other native conifers. He has more than 20 publications in journals of national and international repute. He has worked as a principal investigator of HEC and PSF funded projects for the development of the protocols for the propogation and regeneration of conifers of Balochistan.

Prof. Dr. Muhammad Naeem Shahwani
Professor

Professor Muhammad Naeem Shahwani did his PhD in 2011 from University of Glasgow, Scotland, UK. His PhD research is focused on the development of drought, salinity and thermal stress tolerant crop plants. He compared a large number of elite lines with local plant species of Balochistan on physiological and molecular level of particular local varieties of barley crop plants, growing successfully in dry arid lands of Balochistan conferring significant tolerance against stresses compared to elite European lines. His research is at a stage where he is planning to characterize these land races on molecular level and utilize their built-in diversity for abiotic stress tolerance into high yielding elite lines. His work in these lines is an effort to answer questions arising due to climatic changes and ever increasing fear of food scarcity in under developed World. His research interests are on leaf photosynthesis and its components like, light harvesting complexes (LHC), electron transport chain (ETC) and metabolite pool analysis under salt and thermal stress conditions in cereal crops, genomic and proteomic studies of plants under abiotic stress conditions. He also has research experience in basic seed production through plant tissue culture and hybrid seed development through conventional breeding methods.

Prof. Dr. Agha Muhammad Raza
Dean/Professor

Prof. Dr. Agha Muhammad Raza is working as professor at the Department of Biotechnology, BUITEMS, Quetta. His areas of interest are Dental surgery, Periodontology, Human Dental genetic diseases, Molecular biology. He is certified Implantologist and registered dental surgeon from Pakistan Medical & Dental Council – PMDC. He has published several articles in the National and International journals. He has supervised several MS students.

Prof. Dr. Abdul Wali Tareen
Professor

Dr. Abdul Wali Tareen, Tenured Professor, Department of Biotechnology, BUITEMS, obtained his PhD degree in the field of Human Molecular Genetics from Quaid-i-Azam University Islamabad. Dr. Wali has three years of Post-doctoral experience from Max Plank Institute for Molecular Genetics, Berlin Germany, Institute of Human Genetics, University of Bonn, Germany and Qatar Biomedical Research Institute, Doha, Qatar. He earned several research grants funded by Higher Education Commission of Pakistan, Alexander Von Humboldt Foundation Germany and ORIC-BUITEMS. Through these grants, Dr. Wali has established a new laboratory in the Department of Biotechnology, BUITEMS where he leads all the research activities. The Human Genetics Lab has facilities for advanced research in molecular genetics and molecular biology and is equipped with thermal cycler, gel documentation units, spectrophotometer, micro centrifuges, autoclave and electrophoresis equipment. Dr. Wali research work mainly focuses on the identification and characterization of heritable mutations that result in both rare and common genetic disorders which are prevailing in Balochistan Province. Identification of such gene mutations and variants in inherited disorders can further lead to devising molecular diagnostics for rapid screening and early intervention. His research team has created new knowledge in the field of molecular genetics which is being published in the high repute international journals.

Prof. Dr. Muhammad Mushtaq
Professor

Dr. Muhammad Mushtaq joined BUITEMS in January 2013 as Associate Professor and is a full time, regular professor in the Department of Biotechnology since 2014. He earned PhD Degree with specialization in Mycology and Plant Pathology from University of Karachi in 2003. During the service Dr. Mushtaq has established “Fungal Biotechnology Lab” which is one of the pioneer and unique lab equipped with Biosafety level II and Molecular Biology techniques in Balochistan province established in 2014 in the Department of Biotechnology, Faculty of Life Sciences and Informatics, Takatu Campus, BUITEMS, Quetta. Establishment of this lab was supported by several research grants availed during the period from 2014-2022 by Prof. Dr. Muhammad Mushtaq from ORIC BUITEMS, Pakistan Sciences Foundation (PSF) and Higher Education Commission. The focus of his research is the diagnosis of human and plant fungal diseases and their management, as well as industrial and biotechnological application of fungi. To accomplish this, He is closely working in collaboration of several hospitals of Quetta and Karachi. Apart from PhD students enrolled a number of BS and MS student has completed their research work under his supervision. Dr. Mushtaq is also pioneer to organized international training seminar on Biosafety and Quality Assurance in collaboration with ESCO, Singapore as well as national training workshop on Infection Prevention & Control and Good Laboratory Practices in collaboration with NIH, Islamabad. Dr. Mushtaq has also published several research papers in journals of national and international repute.

Prof. Dr. Shahjahan Shabbir Ahmed
Chairperson/Professor

My research interests mainly lie in gene cloning and developing transgenic plants for better adaptation and utilization. I have worked on cellulose and pectin degradation enzymes in growing fruits for better post-harvest handling and marketing. I am good at various molecular techniques like Gene Cloning, Vector Construction, Primer Designing, PCR, Gel Electrophoresis, Photo-spectrometry, Use of Transmission Electron Microscope (TEM), Competent cells development, Enzymes assay, In-vitro plant propagation, Gene transformation, Southern blotting, Gene validation in transgenic organisms, HPLC, documenting biodiversity via molecular techniques, etc. In the realm of science advanced farm mechanization techniques like regenerative and precision agriculture could not be denied. I am deeply interested to work in such areas of research in the near future but a holistic approach that add values to biodiversity. Dr. Shahjahan is the author of several research papers published in peer reviewed journals. He has also written few chapters of books relevant to natural sciences.

Prof. Dr. Abrar H Khan
Professor

Professor Dr. Abrar H Khan, is working in the Department of Biotechnology, Since 2004. He is currently at various International Position, like Editor in Chief, Associate Editor, Section Editor and Academic of world prestige's journals. He has worked with the Provincial, Federal and International organizations during COVID-19 outbreak and Dengue outbreak. He has published more than 70 international publications with citations above 1500 and impact factor around 200. Prof. Abrar is currently associated with several journals as Associate Editor and Editor that includes: Bioengineered USA; Frontiers in Cellular and Infection Microbiology; infectious Disease Research; Reviews in Medical Microbiology; Advances in Pharmaceutical Sciences; Eurasian Journal of Medical and Oncology.

Prof. Dr. Haleema Sadia
Professor

Dr. Haleema Sadia is working as a Professor at Department of Biotechnology, BUITEMS, Quetta, Pakistan. She earned her PhD degree in Molecular Biology and Biotechnology from University of Veterinary and Animal Sciences, Lahore in collaboration with Department of Veterinary Medicine, University of Cambridge, UK. She has strong background of chemical analysis, diagnostics, sequencing, gene expression and protein expression. Her fields of interests are Molecular Oncology, Genetic diseases and Therapeutics. She has worked in different labs and Universities of Pakistan. Dr. Sadia has presented her work in more than 55 national and international conferences and won several prizes in poster/oral competitions. She has also attended many and organized several workshops / training courses and national / international conferences. She is the member of different societies and reviewer of different journals. She is the member of technical committee Pakistan Science foundation and project reviewer of HEC (NRPU). She has 80+ publications in peer reviewed impact factor journals (I.F=200) and 55 Proceedings. She is active member of different societies and supervising BS, MS and PhD students. She has won three research projects, startup research grant (HEC, 0.5M), ORIC BUITEMS (0.2M) and NRPU project (HEC, 13.86 M).

Prof. Dr. Shakeela Daud
Professor

Dr. Shakeela Daud has joined the Molecular Diagnostic Laboratory of the Centre for Applied Molecular Biology (CAMB) Ministry of Science & Technology Lahore since 2002. she has worked for PCR based Diagnostic Laboratory / Molecular Virology and has learned many useful techniques in the field of Molecular Biology such as DNA and RNA isolation, DNA estimation, HCV Qualitative, HCV Quantitative, HCV Genotyping, Tuberculosis, conventional PCR, Gel electrophoresis and ELISA etc. In 2009, she was assigned the work in Forensic DNA typing laboratory of Centre for Applied Molecular Biology and has a comprehensive list of experimental skills ranging from Forensic Serology & DNA Analysis, PCR Genotyping, Real time PCR, DNA sequencing for mutation analysis, Southern/ Northern blotting and performed many DNA cases including rape, murder, dead body identification and paternity cases. Dr. Shakeela Daud is working as a Professor in the Department of Biotechnology, Faculty of Life Sciences & Informatics in Balochistan University of Information Technology, Engineering and Management Sciences (BUITEMS) Quetta for the last 8 years. She has supervised and co-supervised students at graduate and under graduate level. Her research work is focused on the investigations of mutation in genes in human genetics disorder and in forensic sciences.

Dr. Nusrat Jahan
Associate Professor

As Ph. D in Biosciences (Quantitative Genetics) from Universiti Teknologi Malaysia (UTM), I have participated in and managed a number of federally funded research projects of Malaysia, in the field of Plant Biotechnology. Some select projects include: Association Mapping for Tolerance to Fe 2+Toxicity at germination stage in Rice, Association Mapping for germination traits under salinity stress in elite rice germplasms (Oryza Sativa L.), Distribution pattern of heavy metals ions and its effects on agronomic traits in Capsicum annuum and Microsatellite marker approach to assess hybridity in Oryza sativa L. F1 Cultivars.

Dr. Rozeena Sheikh
Associate Professor

Dr. Rozeena Shaikh is Associate Professor in Department of Biotechnology, she joined BUITEMS in 2014 as Assistant Professor. She obtained her PhD Degree from Dr. A. Q. Khan Institute of Biotechnology and Genetic Engineering (KIBGE), University of Karachi. Her PhD Research work was on “Genetic Mutation/ Polymorphism in ACE and AGT genes in Diabetes, Hypertension and Diabetic Nephropathy”. She served at Molecular Biology (Genetics) Laboratory, Liaquat University of Medical and Health Sciences, Jamshoro from 2007-2009 and then joined KIBGE from 2009-2014. She has expertise in Molecular based diagnosis of several infectious diseases as well as molecular genetic studies of inherited and metabolic disorders in patients of Balochistan. She has availed and completed various research grants through ORIC, BUITEMS which mainly include ORIC, Large Scale Competitive Grant under the Government of Balochistan Grant-in-aid fund for Research and Studies in 2021. She has published Research work in various national/ International Journal.

Dr. Samiullah Khan
Associate Professor

Samiullah Khan joined BUITEMS in 2006 under Faculty Development Program of HEC and obtained the degree of Master of Research (M.Res.) in Plant Sciences from University of Glasgow, UK. In M.Res. he has done projects in the fields of Molecular Biology and Gene Expression. . Before this, he did his M.Sc. in Botany from Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi in 2002. After master’s in plant science, he did PhD in Plant Stress Physiology and Quantitative Genetics from University Technology Malaysia (UTM), Malaysia, where he studied the identification of QTLs for saline-alkaline tolerance at germination stage in indica rice. He performed the genomic analysis of tolerance to saline-alkaline stress at germination stage in rice.

His research interests are, quantitative genetics, quantitative trait loci, plant physiology, plant stress and molecular breeding. Currently, he is supervising several PhD students in Biotechnology, Plant Science and Molecular Biology.

Dr. Imrana Niaz Sultan
Assistant Professor

She has completed her PhD degree in the field of Biotechnology from Kasetsart University, Bangkok, Thailand, in September 2020. Currently, she is working as an Assistant Professor at the Faculty of Life Sciences and Informatics, BUITEMS. Her PhD research was in the field of Genetic Engineering and Biochemical Engineering. She introduced a novel method of making genes cassette, termed as the "Gene Assembly and Ligation (GAL)" technique. Moreover, by gene manipulation, she could produce two novel tharmotolarant yeast strains which converted the lignocellulosic biomass into bioethanol for industrial purpose. Besides being the ambassador of the United Nations Academic Impact Hub for Sustainable Development Goal 8 (SDG8), BUITEMS, she is also the member of BUITEMS Editorial Board. She is the Master Trainer of Higher Education Commission (HEC) Pakistan. She has conducted several training programmes at provincial and national level. Her research expertise are in the area of Genetic Engineering, Metabolic Engineering, Biochemical Engineering, Biofuels and Biorefineries, Biotechnology and Food Processing. She is currently running projects related with biofuel generation through second and third generation biomass.

Dr. Muhammad Waseem Khan
Assistant Professor

Dr. Muhammad Waseem Khan is serving Balochistan University of Information Technology Engineering and Management Sciences (BUITEMS) as an Assistant Professor in the Department of Biotechnology. He has doctoral degree (2020) from University of Eastern Finland, Finland in Environmental Health. Earlier, He did his M.Phil from Aga Khan University Hospital, Karachi and Bachelors from BUITEMS, Quetta. Before joining BUITEMS, He has worked as Research Officer with Aga Khan University Hospital, Karachi, Pakistan and with United Nations Food & Agriculture Organization. Dr. Waseem Khan is member of Bioethics Assembly, Pakistan; Finnish Bioelectromagnetics Investigators, Finland; American Society for Microbiology (Global Outreach-Postdoctoral membership); and Publication Integrity & Ethics, London, UK. He has obtained various scholarships and fellowships during his studies from different organizations including Fogarty International, United States of America; National Institute of Health, USA; Higher Education Commission, Pakistan; Alfred Kordelin Foundation, Finland; European Atomic Energy Community, European Union, Switzerland; and International Institute for Environmental Studies, Ontario, Canada. His research areas of interest are Environmental Health and Environmental Epidemiology. He is particularly interested in investigating adverse health effects (Cancers: Hematological neoplasms, Glioma, Meningioma, Melanoma, Squamous cell carcinoma; cardiovascular diseases and reproductive health effects) of exposure to ionizing / non-ionizing radiations, particulate matters (PM 10, PM 2.5, PM 0.1) and other environmental stressors. Dr. Waseem Khan has published several articles on adverse health effects of exposure to environmental stressors in high impact scientific journals.

Dr. Naveed Iqbal (on Study Leave)
Assistant Professor

Naveed Iqbal has joined back BUITEMS as Assistant professor after doing his PhD research from PIAS (NIBGE), PCMD (HEJ) and BGI (Hong Kong) in a split PhD fellowship. He has done his PhD research in genomics and big data analysis from world's largest sequencing & data analysis facility, the Beijing Genomic Institute (BGI), Shenzhen, HongKong. His keen interest is revealing selection signatures associated with economically important quantitative agricultural/livestock traits and promoting human health for the wellbeing by exploring the basis of hereditary diseases. Being a research fellow at BGI-Shenzhen, he is currently working on multiple collaborative projects emphasizing on microbial genomics, metagenomics and metabolomics. Of which the SARS-CoV-2 differential genomic responses to various environmental stressors and revealing biosynthetic genes clusters for economically important microbial secondary metabolites are recently recognized worldwide. He has expertise in research, evaluation, and teaching in research and academic institutes, i-e BGI and BUITEMS. His research area encompasses but not limited to evolutionary, functional, and comparative genomics.

Dr. Afrasiab Khan Tareen
Assistant Professor

He has completed his PhD degree in the field of Biotechnology from Kasetsart University, Bangkok, Thailand. Currently, Dr. Afrasiab Khan Tareen is serving Balochistan University of Information Technology Engineering and Management Sciences (BUITEMS) as an Assistant Professor in the Department of Biotechnology. His PhD research was in the field of Biochemical Engineering. During his studies, he was able to produce efficient bioethanol as an alternative source of fossil fuel through second generation biomass of oil palm trunk (OPT). Through utilization of "Bio-refinery concept with Zero Waste", he could produce an ample amount of industrially significant compounds such as Furfural, Dimethyl furfural, Acetic acid, and Luvulinic acid from lignocellulosic biomass. Moreover, he studied various fermentation techniques to optimize conditions for the production of biofuels and scaling it up to industrial level. He also worked as a Lead Researcher in two internationally funded Thai-China research projects related to ethanol production using Bio-refinery concept. His research areas of interest are Renewable Energy, Biomass Valorization, Waste Bio-refinery, Waste-to-Energy, Algal Biodiesel and Environmental Biotechnology. Additionally, He has published 19 scientific articles in peer reviewed international scientific journals. His recent publications are available in renowned journals such as Bioresource Technology, Bioenergy Research, and Environmental Progress and Sustainable Energy.

Dr. Abdul Wajid
Assistant Professor

Dr. Abdul Wajid is working as Assistant Professor at the Department of Biotechnology, BUITEMS, Quetta. He is keen interest in the field of molecular virology, human and animal genomics. He is molecular virologist with research experience on infectious diseases mainly focus on Paramyxovirus and Orthomyxovirus of domestic and wild origin. His key interests are evaluation of vaccines, epidemiology, virus-host interactions and characterization of pathogens of animal and public-health concern. He is also trained in studying association of genetic diversity with performance and production potential of domesticated species. He is actively involved in academics and research activities in collaboration with several national and international institutes worldwide. He has published >100 research article, RG score of 26, 846 citations, h-index of 15 and i10-index 18. He has been working as PI, Co-PI, Team Member and Research Associate in various research Projects on virology, human and animal's genomics. He has supervised >40 MS students and several MS and PhD students working under his supervision and co-supervision. With this summary, Dr. Abdul Wajid is committed to further continue in the area of his background expertise that includes but not limited to surveillance and epidemiology of the infectious disease, molecular characterization of pathogens of . veterinary and public health importance and human/animal genomics

Dr. Muhammad Mushtaq Yasinzai
Assistant Professor

Dr. Muhammad Mushtaq Yasinzai has joined BUITEMS as Assistant Professor in 2021. He has completed his PhD from Karolinska Institute Sweden in Medical Sciences with focus on Tumor Biology. After PhD, he has done 3 postdocs on same subject. Dr. Mushtaq has vast experience in Tumor Biology working with different tumor models and state of the art in vitro as well as in vivo techniques. Dr. Mushtaq is principal investigator of a research group that is composed of several PhD and MS students. He has established a drug screening facility here in BUITEMS. With the help of in silico and in vitro approaches he is keen to identify and design potentially drugs that can eradicate cancer. For this purpose, his group is screening large scale libraries of bioactive molecules against different oncoproteins to find therapeutic drugs against tumors in order to combat this deadliest disease. He has published 15 scientific articles in peer reviewed international scientific journals. Two of his recent articles are published in PNAS and J. Exp. Clin. Cancer Res. which has impact factor of more than 10.

Dr. Rafiullah
Assistant Professor

Dr. Rafiullah joined BUITEMS as Assistant Professor in September 2021. He obtained PhD degree in the field of Human Molecular Genetics from Ruprecht Karl University of Heidelberg, Germany in 2017. For doctoral studies, he was awarded with prestigious German scholarship DAAD. Durring his stay in Heidelberg, Dr. Rafiullah was teaching and supervising medical students at University of Heidelberg, Germany. Adittionally, he worked as clinical scientist from Januray 2018 to July 2021 at KFSH&RC international Holding, Riyadh, Saudi Arabia. He is interested in the study of human genetic variations which may cause developmental disorders in consanguineous population. Identification of genetics variants is of crucial importance to understand the molecular mechenism of genes. Understanding the molecular mechenism is of critical importance in the diagnosis, prevention, management and eventually therapy of various genetic diseases. He has good experience in field of human molecular genetics and studied thousands of families with genetic anomalies and identified more than 200 novel and candiate genes contributing to genetic diseases. His findings are published in high ranked internation journals. Currently he is leading a group of PhD and MS students at Human Molecular Genetics laboratory at BUITEMS.

Dr. Rameez Ishaq
Assistant Professor

Dr. Rameez Ishaq joined BUITEMS as Assistant professor at the end of 2021, after completing his Master's degree from Universite Paris Val de Mare (Paris XII) and then successfully defending his PhD thesis from Universite de Paris (Paris, France) on a HEC 90% Overseas Scholarship. His PhD research was on Onco-Hematology which he undertook at the Institute Gustave ROUSSY, (IGR) Paris France, one of the leading Cancer hospital and research centers of Europe. His research focused on the mechanisms that allow hematopoietic cells to produce platelets in order to explain how abnormalities in these cells can lead to platelets disease and leukemia. Through investigating the development of megakaryocytic diseases thanks to the study of two types of pathologies which constitute a reservoir of information for fundamental biology: hereditary thrombocytopenia, and sporadic and familial myeloproliferative neoplasms (MPN) (essential thrombocythemia, myelofibrosis primary).Equipped with a Doctor of Pharmacy (PharmD) degree from Hamdard university further helped him in diversifying his scientific research, giving him the opportunity to publish in internationally reputed journals. His current research is on natural products from plant and animal origin to find a treatment for cancer. Focusing on the role of transcription factors such as RUNX1and FLI-1 and epigenetic factors ASXL1 and ASXL2.

Mr. Imran Ali Sani
Assistant Professor

He is Assistant Professor in the Department of Biotechnology. He Graduated from University of Agriculture Faisalabad with research focused on biodiversity, systematics and taxonomy. Before joining BUITEMS he worked as Agriculture officer and Lecture in Balochistan Agriculture University .where he taught several courses of graduate and Post graduate level. He supervised Master's students for their research work. He served as Controller of Examination and Deputcy Registrar in BAC Quetta. My primary molecular interests are Insects& Plant gene cloning and deciphering functional analysis in the transgenic organisms. Since the past decade, my research work dedicated on solving the control of Insect pest/diseases through molecular techniques. High tech and cutting edge molecular techniques like polymerase chain reaction (PCR), real time (RT-PCR), Gel Electrophoresis, Photo-spectrometer, Use of SEM, HPLC, etc. were learnt during the research in BUITEMS. During the last few years, I have been involved in the field projects related to Juniper forests and Juniper ecosystem of Balochistan. Salient features in these projects exist molecular assessment of Juniper ecosystem and allied species of these forests and InsectsPests present in Ziarat, Zhob and Harboi districts of Balochistan. DNA barcoding is exercised in the collected flora and fauna of mentioned forests and its applicability and feasibility have been deciphered. Trainings of local farmers and other stake holders have been conducted during last few years and till date.

Ms. Shumaila Siddique
Assistant Professor

Shumaila Siddique did her Bachelors in Biotechnology and Informatics in 2009 with her research topic as oral health status. She joined BUITEMS in 2012 as a lecturer and later on she was appointed as Assistant Professor in 2016. She taught courses that include Genetics, Introduction to Biotechnology, Bio-Informatics and Bio-Analytical Techniques. She has supervised and conducted the research work of Undergraduate students of BS (Biotechnology & Informatics). Her research interest is in Molecular Genetics. Currently she is PhD scholar working on bioinformatics.

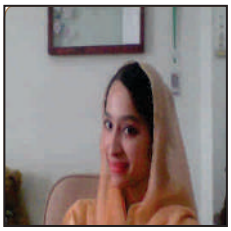
Mr. Akram Ali Baloch
Lecturer

Akram Ali Baloch has been serving as a Lecturer in the Department of Biotechnology, BUITEMS since 2016. He did his BS and MS in Biotechnology and Informatics from BUITEMS respectively. He has enrolled in PhD (Biotechnology) in 2017. He is in final stage of his thesis. In recent times, he is working on "Systematic genomic study of growth and stress-responsive CNGC family in Brassicaceae: de novo identification, characterization, evolutionary and functional analysis". He has multiple international research publications. He is also reviewing articles in different journals of Nature. Besides these, he is a good motivator and counsellor. Mr. Baloch has also done Master in International Relations (IR). He has written several columns in the national newspapers.

Ms. Muneeza Arbab
Lecturer

Muneeza Arbab is Lecturer in the Department of Biotechnology since 2016. She did her Master's of Science (MS) in Molecular Genetics from COMSATS Institute of Information technology, Islamabad. During MS, she worked on "Analysis of TNF-α for Keratoconus in Pakistani Population". She did her Bachelors of Science (BS) with badge of honor in Biotechnology and Informatics from BUITEMS. She was awarded merit-based scholarship throughout her BS-years (2009-2013). Her research interest is in Molecular Biology and Human Molecular Genetics. She is the member of Pakistan Bio-Safety Association.

Ms. Nida Tabassum Khan
Lecturer



Nida Tabassum Khan is a Ph.D. scholar and Lecturer in the Department of Biotechnology and Informatics at BUITEMS since 2015. She has participated in numerous national and international symposiums/seminars /webinar and has published more than one hundred and sixty research papers as first author in various national/international double peer reviewed reputed journals. In addition, she has been involved as a potential reviewer and editor for numerous international journals. Besides, she has directed more than twelve BS dissertation. She has been a pioneer in establishing and advocating the emerging field of Myconanotechnology at BUITEMS and has successfully synthesized biogenic metal nanoparticles such as copper, silver, titanium etc from different fungal species accompanied by synthesis reaction optimization. Her research background has been focused on different areas in the field of Nanobiotechnology, Microbial technology, Sustainable energy (Biofuels) /biopolymers, fabrication of novel nanomaterials and nanosafety. In addition, her ongoing projects focused mainly on Insilico modeling, Bioinformatics and Toxicological studies for hazard assessment. Besides her expertise also lies in Clinical pathology, Psychological and neurological disorders, Addiction, Behavioural therapy, Mental health counselling, Haematological disorders and Public health and safety concerns linked with SGDs goals to find novel methodologies/techniques for disease diagnosis and treatment for human well-being.

Ms. Arooj Khan
Lecturer

Arooj Khan is Lecturer in the Department of Biotechnology since 2015. She is currently enrolled as PhD Scholar in the same department where she intends to study some molecular and applied aspects in poaceae family. She did her MS in Biotechnology & Informatics from BUITEMS in 2018. Her areas of research are Plants Sciences, DNA Barcoding, Climate Change & its impact, Clinical Diseases & Public Health. She secured a grant from Forest Department under Ten Billion Tree Tsunami (TBTT) Project. She is currently working on Sustainable Development Goals and building the capacity of young students on SDGs by conducting different online and offline workshops. She has dynamic working experience in development sector in different projects in different organizations.

Mr. Aemal Khan Tareen
Lab Supervisor (contract)

I did my graduation and masters from Balochistan university of information technology engineering and management sciences (BUITEMS), in Biotechnology and informatics.My graduation research topic was esophageal cancer and the topic of my MS research was Prevalence of zoonotic diseases T.B and Brucellosis in animals domesticated in Pishin district of Balochistan as a researcher with relief international (RI). My paper was published in Pakistan journal of zoology (PJZ) in 2016 in zoonotic diseases in Pishin district. Currently I am doing my PhD from royal collage of medicine Perak Malaysia on impact of climate change on Melioidosis.

Mr. Dawood Shahid
Lab Supervisor (contract)

Active, adaptable, and hard-working individual with having Master of Science (MS) degree in Biotechnology & Informatics, currently working as a laboratory supervisor at the Department of Biotechnology, Faculty of Life Sciences & Informatics BUITEMS, Quetta. Working as a research associate in a project related to DNA Barcoding at BUITEMS and during MS research I learned & trained in lab techniques (DNA extraction, PCR, Gel Electrophoresis, etc.) also have command on laboratory equipment used in experiments. I am currently a PhD (Biotechnology) scholar and hope to learn more about biotechnology, especially in molecular biology and bioinformatics techniques used in my research work.

Ms Tahani Javed
Lab Supervisor

Ms. Tahani Javed is serving BUITEMs since August 2017 as Laboratory Supervisor in the Department of Biotechnology and Informatics, FLSI. She has completed her master's degree (MS) from BUITEMs in 2017. During her MS research she worked in plant molecular genetics lab, and contributes in developing genetic barcodes of different species and varieties of Brassicaceae campestris. Moreover, she is a PhD scholar; her field of research is bioinformatics and plant molecular genetics, working in the Cobol laboratory.

Ms. Kamilla Shah
Lab Supervisor

Miss Kamilla Shah is serving as Laboratory Lecturer at Department of Biotechnology in the Faculty of Life Science & Informatics, since 2019. She has also served as an intern lecturer at the department of Biotechnology in SBK Women's University, Quetta. Currently she is also enrolled in a PhD Program at department of Biotechnology, BUITEMS. She received Master's degree in biotechnology from BUITEMS University in 2018 and B.S. degree in biotechnology from SBK Women University, Quetta in 2016. She has been actively participating and organizing conferences. Her research interests include Human Molecular Genetics and Cancer drug discovery.

Mr. Ajab Gul
Lab Supervisor

Mr. Ajab Gul received his M.Sc degree from deptt of Biochemistry/Molecular Biology, QAU Islamabad and MS degree from deptt of Biotechnology and Informatics, BUITEMS. He served BUITEMS as Visiting Lecturer at Deptt of Microbiology from Fall-17 to Spring-18 and currently, serving BUITEMS as Laboratory supervisor (BPS-17) since Fall-2018 at Human Molecular Genetics Laboratory, deptt of Biotechnology, where he trains the BS Biotechnology students in Biochemistry and Molecular Biological Techniques useful in their BS research projects. His research interest is in the domain of Molecular Biology and Bioinformatics. Mr. Ajab Gul also reported DNA mutations in different genes including STS, WNT10B and XPC genes responsible for different Human Genetics Disorders in the Pakistani population.

Ms. Safina bazai
Senior Lab Assistant (contract)

Safina Bazai is currently working as senior Lab assistant in the Department of Biotechnology. She did her BS in Biotechnology and bio-informatics during 2004 -2008 session. Due to good research skills she was appointed as a lead researcher in Balochistan pine project with Prof. Dr Saeed Ahmed. During her job she learned more research and laboratory techniques and also conducting practical to BS students in FLSI faculty.

Mr. Muhammad Iqbal
Lab Assistant (contract)

Mr. Muhammad Iqbal is working as Laboratory assistant in the Department of Biotechnology, Faculty of Life Sciences and Informatics since 2012.

Faculty on Study Leave (Biotechnology)

Prof. Dr. Naseebullah Kakar
Professor

Dr. Naveed Iqbal
Assistant Professor

Ms. Khadija Kakar
Assistant Professor

Ms. Ghazala Muhammad Ali
Lecturer

Ms. Sara Naudhani
Lecturer

Mr. Nisar Ahmad
Lecturer

RESEARCH AND LABORATORIES

Research and Laboratories

Human Molecular Genetics Lab I

The Human Molecular Genetics Laboratory (HMG) at BUITEMS, established in 2005, conducts research leading to the understanding of underlying molecular mechanisms in various inherited disorders. HMG laboratory has facilities for advanced research in molecular genetics, molecular biology and is equipped with thermal cycler, gel documentation units, spectrophotometer, microcentrifuges, electrophoresis equipment and ABI genetic analyzer. The research of HMG Group mainly focuses on the identification and characterization of heritable mutations that result in both rare and common genetic disorders prevailing in Balochistan. The research investigators have earned different national and international research grants for the genetic mapping of rare diseases and characterization of their downstream consequences to the study of common heritable disorders using different genomic and bioinformatic approaches. Identification of such gene mutations and variants can further lead to devising molecular diagnostics for rapid screening and early intervention. The group has published several research articles in international journals of high repute.

Team Leader: Prof. Dr. Asthma Yousafzai
Other Team's member: Prof. Dr. Haleema Sadia, Prof. Dr. Shakeela Daud, Dr. Rafiullah Abdul Ahad, Dr. Rameez Ishaq, Dr. Abdul Wajid

Human Molecular Genetics Lab I (Lab equipment)

S. No.	Items	Quantity	Working
1	Thermocycler	1	yes
2	UV transilluminator	2	yes
3	Genetic Analyser ABI	1	No
4	Verticical gel PAGE	1	yes
5	Gel Electrophoresis system	1	yes
6	Centrifuge (15ml FT)	1	yes
7	Water Bath	1	yes
8	Balance	1	yes
9	centrifuge (500ml)	1	yes
10	Vortex	1	yes
11	micro-centrifuge (1.5ml)	1	yes
12	micowave oven	1	yes
13	Hotplate stirrer	1	yes
14	small distillation plant	1	No
15	ultra pure purification system	1	No
16	refrigerator	3	yes
17	pippets (10uL, 100ul, 20uL, 1000uL,2ul)	10	yes
18	Ice Maker	1	No

Biotechnology

Human Molecular Genetics Lab II

The Human Molecular Genetics (HMG) Laboratory II at BUITEMS, established in 2021. The laboratory is led by Prof. Dr. Abdul Wali Tareen and other group members are Dr. Rozeena Shaikh, Dr. Muhammad Mushtaq Yasinzai and Dr. Rafiullah Tareen. Several PhD and MS students are working on different projects in the laboratory. The group conducts research leading to understand molecular mechanisms underlying various Genetic disorders. HMG laboratory has facilities for research in Human Genetics and Molecular Biology and is equipped with thermal cyclers, gel documentation units, Qubit flourometer, microcentrifuges, electrophoresis equipment, water bath and autoclave. The research of HMG group mainly focuses on the identification and characterization of heritable variants that result in both rare and common genetic disorders such as diabetes mellitus, congenital heart diseases, infertility, skin disorders, cancer and developmental disorders including neurological, skeletal, ophthalmic disorders. The researcher have executed different national and international research grants which vary from genetic mapping of rare disease causing variants and characterization of their downstream effects to the study of common heritable disorders using different genomic and bioinformatics approaches. The group in the laboratory are using combination of different methodologies such as PCR, RFLPs, Sanger sequencing, Next Generation Sequencing (NGS) and bioinformatics tools. Identification and characterization of genetic variants underlying diseases are of crucial importance for understanding the , molecular mechanism prevention, management and eventually therapy of the disease and will led the foundation for personalized medicine. The research group working in this lab has published several research articles in high ranked international journals, such as American and European journals.

Team Leader: Prof. Dr. Abdul Wali
Other Team's member: Dr. Rozeena Shaikh, Ms. Maliha Rehman

Human Molecular Genetics Lab II (Lab equipment)

S. No.	Items	Quantity	Working
1	Thermocycler	1	yes
2	UV transilluminator	1	yes
3	PH meter	1	yes
4	Verticical gel PAGE	1	yes
5	Gel Electrophoresis system	1	yes
6	Flourometer	1	yes
7	Water Bath	1	yes
8	Balance	1	yes
9	centrifuge (1.5ml)	1	yes
10	Vortex	1	yes
11	micro-centrifuge (1.5ml)	1	yes
12	Refrigerator	1	yes

Yeast & Fungal Lab

This lab is dedicated for the Biotechnological applications of filamentous and yeasts (unicellular) fungi. Using DNA finger printing (barcoding) some of the research students are involved in the identification of human pathogenic fungi such as Candida species and dermatophytes etc. from clinical specimens. On the other hand a group of student is involved in isolation of yeasts from fresh fruits such as kinnow, apple, peach, strawberry, pomegranate and screening their antagonistic activity against plant pathogenic fungi. This lab is also pioneer to produce nanoparticles using some fungal strains which is a green approach to synthesize them. Our future aims are to screen the efficacy of antifungal antibiotics against human pathogenic fungi, to patent and commercialize antagonistic yeasts strains, to optimize production of nanoparticles and also to produce bio-transformed drugs using fungal strains.

Team Leader: Prof. Dr. Muhammad Mushtaq
Other Team's Members: Ms. Kashaf Zafar, Ms. Muneeza Arbab, Ms. Jamila , Ms. Maryam Sadique, Dr. Faheem Nawaz, Mr. Ashiq Khan

Plant Stress Physiology

In plant stress physiology lab an active research group is engaged in the task of characterizing landraces of different staple crops i.e. wheat, barley, sorghum and maize etc. Under this topic, group is attempting to explore the physiological and ultimately molecular basis of abiotic (drought, salinity and thermal) stress tolerance of uncharacterized germplasm, enabling them to survive and reproduce from centuries in the harsher conditions of Balochistan. Along with this the team is focusing on the effects of environmental stress on plant membranes by using physiological, biochemical and molecular / genetic approaches to determine how environmental stress factors affect plant membranes. Long term aim of this team is to evolve abiotic stress tolerant crop varieties having better ability to grow and produce staple food on marginal (not suitable for cultivation) lands of Balochistan in particular and Pakistan in general.

Team Leader: Prof. Dr. Muhammad Naeem
Other Team's Member: Mr. Akram Ali

Plant Stress Physiology (Lab equipment)

S. No.	Items	Quantity	Working
1	Desicator(dry oven)	1	yes
2	Atomic absorption Spectrophotometer	1	yes
3	Refrigerator	1	yes
4	Flame wood	1	yes
5	Hotplate stirrer	1	yes
6	Microscope	1	No
7	PH meter	1	yes
8	Balance	1	yes
9	centrifuge (15ml)	1	yes
10	Distilled Water Plant	1	yes
11	Flame Photometer	1	No
12	CID Bioscience Photosynthesis meter	1	No
13	Autoclave	1	yes

Plant Molecular Genetics

The mentioned lab is located on the 2nd floor of the department of Biotechnology at the Faculty of Life Sciences (FLS&I), Iqbal Hall, Takatu Campus, (BUITEMS), Quetta. Researchers on various scales are working and quenching their thrust over here. The lab is categorized as a "specialized lab" under the supervision of Prof. Dr. Nazeer Ahmed and the team comprising Prof. Dr. Shahjahan Shabbir Ahmed Rana, Mr. Imran Ali Sani, Dr. Saadullah, and Mr. Dawood Shahid. The lab is typically equipped for molecular set up plant genetics and biotechnology. Basic needs for molecular research are optimized in the form of equipment and consumables. In the recent past researches on the following aspects are carried out in the lab.

1. Documenting the Biodiversity of plants and insects on a Molecular Level
2. Gene Cloning and rDNA Development
3. Detection of hazardous chemicals from various Samples
4. Phyto-chemical detection and function
5. Non-Pathogenic Bacteria Culturing, etc.

Team Leader: Prof. Dr. Nazeer Ahmed
Other Team's Members: Prof. Dr. Shahjahan Shabbir Ahmed, Dr. Sadullah Mr. Imran Ali Sani

Plant Molecular Genetics (Lab equipment)

S. No.	Items	Quntity	Working
1	Thermocycler	2	yes
2	UV transilluminator	2	yes
3	HPLC	1	yes
4	Verticical gel PAGE	1	yes
5	Gel Electrophoresis system	1	yes
6	Centrifuge (15ml FT)	1	yes
7	Water Bath	2	yes/No
8	Balance	1	yes
9	centrifuge (500ml)	1	yes
10	Vortex	2	yes
11	micro-centrifuge (1.5ml)	2	yes
12	micowave oven	2	yes
13	Hotplate stirrer	1	yes
14	small distillation plant	1	No
15	refrigerator	2	yes/No
16	refrigerator (-40, -20)	2	yes/No
17	pippets (10uL, 100ul, 20uL, 1000uL,200ul)	10	yes
18	shaking Incubator	1	yes
19	Laminar Flow wood	1	yes/No
20	PH meter	1	yes
21	2 micro-centirfuge (1.5ml)	2	No

Cell & Tissue Culture-I

Plant tissue culture involves growing plants in an artificial medium under sterile conditions in a jar, flask or test tube. Plant tissue culturing techniques are essential for academic research, as well as many applied aspects of plant sciences. Practically any plant transformation experiment relies on tissue culture. Although there are various methods of gene transformation reported over the last two decades but Agrobacterium mediated transformation has proven to be the best among the scientific community and it purely relies on the availability of tissue culture lab. Plant tissue culture techniques are also central to innovative areas of applied plant science including plant biotechnology. In BUITEMS we have well equipped tissue culture laboratory where we demonstrate new ways of propagating native as well as exotic plants. The laboratory also demonstrates embryogenesis and organogenesis which are the techniques whereby plants and organs are regenerated from cells. The techniques learnt by the students and researchers have potential to become an integral part of plant breeding programs.

Team Leader: Dr. Nusrat Jahan
Other Team's Members: Prof. Dr. Shahjahan Shabbir Ahmed, Mr. Imran Ali Sani

Cell & Tissue Culture-I (Lab equipment)

S. No.	Items	Quantity	Working
1	Desicator(dry oven)	1	yes
2	Laminor flow wood	1	yes
3	Refrigerator	1	yes
4	Verticical gel PAGE	1	yes
5	Hotplate stirrer	1	yes
6	Microscope	1	yes
7	Water Bath	1	yes
8	Balance	1	yes
9	centrifuge (1.5ml)	1	yes
10	Distilled Water Plant	1	yes
11	pippet (10ul)	1	yes
12	Mini Orbit Shaker	1	No

Cell & Tissue Culture-II

The Applied Biotechnology Lab was founded in 2019 with the assistance of projects funded by the Higher Education Commission of Pakistan. It is outfitted with necessary instrumentations to conduct research in molecular microbiology, including a gradient thermocycler, Lamiar flow cabinets, centrifuge, electrophoresis, lypholizer, growth chambers, and incubators. The lab is collaborating with various industries across the country to develop a bioformulated fungicide based on indigenous microbes. The lab is working with other universities to develop fungi and virus resistant transgenic potato crops. Not only do Master's and PhD students from BUITEMS conduct research in the Applied Biotechnology lab, but students from other universities do as well.

Projects:

1. The development and of transgenic potato lines tolerant to fungi and viruses.
2. The development and commercialization of a broad spectrum bio-formulated fungicide.

Patent applied:
510/2021. The PCR base cost effective 100bp DNA ladder

Team Leader: Dr. Anwar Khan
Other Team's Members: Dr. Nusrat Jahan, Prof. Dr. Shahjahan Shabbir Ahmed, Mr. Imran Ali Sani, Ms. Samia Parveen

General Laboratory I

The general lab for Biotechnology-I is the main laboratory in the Department of Biotechnology equipped with basic equipment for the BS level students. Biotechnology lab I facilitate students with the fundamentals of biotechnology and hands-on laboratory training and internship opportunities. The laboratory has up-to-date equipment of pH analysis, UV-Spectrophotometry, Hot air oven, Incubators, electrical balance and stock chemicals. It provides exceptional environment for growth, learning and research.

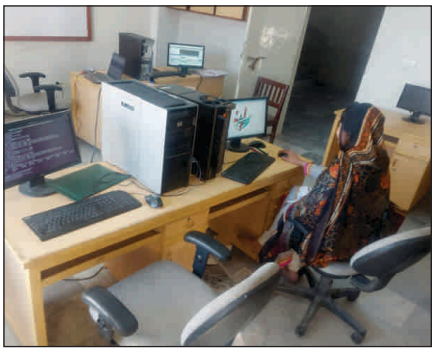
Team Leader: Dr. Abdul Wajid
Other Team's Members: Dr. Muhammad Waseem Khan, Dr. Rameez Ishaq Ms. Arooj Khan, Ms. Nida Tabbussum

General Laboratory II

The lab is equipped with fully functional growth chamber, autoclave and laminar airflow hood. This lab is used for general research and undergraduate practical purposes. However, research projects related with biofuels production and product development are also carried out here. In the nutshell, attributable to the flow of researchers and undergraduate students, this lab is mostly occupied with research activities. The General Lab II is under the process of flourishing and in future there will be more equipment to facilitate the students.

Team Leader: Dr. Imrana Niaz Sultan
Other Team's Members: Dr. Muhammad Waseem Khan, Dr. Afrasiab Khan Tareen

Bioinformatics



Computational Biology Laboratory (CBL) was established by Dr. Muhammad Mushtaq Yasinzai and Dr. Asma Abro in 2022. Dr. Mushtaq Yasinzai is conducting a part of his research project focusing on anti-cancer drug discovery. Several PhD and MS students are working on this project. The project is based on in silico and in vitro techniques, to identify potential drugs against cancer in large libraries of bioactive compounds. The in silico part of the project is being conducted at the CBL. For this project 3 high-end server workstation computers are installed in the lab, two of these machines are equipped with Intel Xeon 2683-V4 dual processors supported with Nvidia GeForce RTX 2070 SUPER and Nvidia GeForce GTX 1080 gpus. The other workstation contains dual Intel Xeon 5670 processors. These computers are performing their job 24/7 to screen the drugs libraries against most potent oncoproteins like RAS, MYC, TERT etc. To ensure an uninterrupted supply of electricity a backup system is also installed. For screening purpose the computers are equipped with several up to date Bioinformatics tools like, Vina, GOLD, FRED, Fitted and NAMD software. A sequential and systematic protocol has been established for the project. The identified drugs will be further experimentally verified at the Human Genetics Laboratory II, Department of Biotechnology.

Team Leader: Dr. Asma Abro/Dr. Muhammad Mushtaq
Other Team's Member: Dr. Naveed Iqbal

List of On-going Projects (Biotechnology)

On-going Projects					
S. No.	**Principle Investigator**	**Title**	**Duration**	**Funding Agency**	**Cost**
1	Prof. Dr. Naseeb-Ullah	Next-generation Molecular Genetic Detection for the Chromosomal Abnormalities and Hematopoietic Malignancies in Balochistan Province	2021-2023	GoB ORIC BUITEMS	PKR 3.2 M
2	Prof. Dr. Muhammad Mushtaq	Enhancing Country Capacity for Fungal Diseases in Pakistan	2022-2023	CDC, USA Under Program CK21- 2106	$63,925
3	Prof. Dr. Muhammad Mushtaq	Molecular Diagnostics of Human Pathogenic *Candida* Species from Clinical Specimens	2022-2024	HEC-NRPU	PKR 9.482000 M
4	Prof. Dr. Abdul Wali Tareen	Genetic Analysis and Functional Studies of Inherited Skin Disorders from Balochistan	2018-2023	HEC-NRPU	PKR. 7.8 million
5	Prof. Dr. Nazeer Ahmed	DNA Based Floral Biodiversity Inventories of Quetta, Zhob, Musakhel and Harnai Districts	2022	HEC	
6	Prof. Dr. Nazeer Ahmed	New Frontiers in Research Fund Canada (Co-Investigator)	2022	Transformation 2020	
7	Prof. Dr. Nazeer Ahmed	Prioritizing Potential Applicability of Scelio to combat the Desert Locust Problem (Co-PI)	2022	HEC	

List of On-going Projects (Biotechnology)

On-going Projects					
S. No.	**Principle Investigator**	**Title**	**Duration**	**Funding Agency**	**Cost**
8	Prof. Dr. Haleema Sadia	Determination of Molecular Biomarkers for Breast Cancer Patients in Pakistan for Early Diagnosis and Prognosis	2022-2025	HEC NRPU	PKR 13860000

List of Completed Projects (Biotechnology)

Completed Projects					
S. No.	**Principle Investigator**	**Title**	**Duration**	**Funding Agency**	**Cost**
1	Prof. Dr. Shakeela Dawood	Study on estimation of allele's frequencies STR markers (D5S818 and D7S820) in Baloch Population	2015-2016	ORIC/BUITEMS	PKR 150,000
2	Prof. Dr. Shakeela Dawood	Study on estimation of allele's frequency of STR markers (D16S539, D13S317) in Baloch and Pashtun population	2016-2017	ORIC/BUITEMS	PKR 90,000
3	Prof. Dr. Shakeela Dawood	Identification and characterization of mutations in *GLI3* gene in Balochistan families suffering from Polydactyly	2017-2018	ORIC/BUITEMS	PKR 92,000
4	Prof. Dr. Shakeela Dawood	Identification of mutation in *TYR* genes causing albinism in patients of Balochistan	2017-2017	SRGP-HEC	PKR 496, 700
5	Prof. Dr. Shakeela Dawood	Allele frequencies for 3 Short Tandem Repeat Loci (Amelogenin, FGA & TH01) in blood samples of Hazara Population	2018-2019	ORIC/BUITEMS	PKR 150,000
6	Dr. Rozeena Shaikh	Mutation Identification in Collagen Type VII (COL 7 A1) in Dominant and Recessive Epidermolysis Bullosa	2014-2015	ORIC/BUITEMS	PKR 150000
7	Dr. Rozeena Shaikh	Molecular Genetic Analysis of Inherited Nail Dysplasia	2015-2016	ORIC/BUITEMS	PKR 200000
8	Dr. Rozeena Shaikh	Study on Estimation of Allele frequencies of STR markers (D16S539, D13S317) in Baloch and Pashtun Population	2016-2017	ORIC/BUITEMS	PKR 90000

List of Completed Projects (Biotechnology)

Completed Projects					
S. No.	**Principle Investigator**	**Title**	**Duration**	**Funding Agency**	**Cost**
9	Dr. Rozeena Shaikh	Vascular Endothelial Growth Factor Gene Polymorphism in Diabetes Mellitus and Diabetic Retinopathy Patients of Balochistan	2016-2017	ORIC/BUITEMS	PKR 200000
10	Dr. Rozeena Shaikh	Identification of DMD gene mutations in Duchenne Muscular Dystrophy patients of Balochistan"	2017-2018	ORIC/BUITEMS	PKR 150000
11	Dr. Rozeena Shaikh	Identification of ECM1 Gene mutation in Lipoid Proteinosis patients of Balochistan, Pakistan	2018-2019	ORIC/BUITEMS	PKR 186000
12	Dr. Rozeena Shaikh	Vascular-Endothelial Growth Factor (VEGF) Gene Polymorphism in Diabetes Mellitus and Diabetic Retinopathy Patients of Balochistan	2021-2021	ORIC/BUITEMS	PKR 2.9 M
13	Prof. Dr. Muhammad Mushtaq	Molecular Diagnostics of Human Pathogenic *Candida* Species from Clinical Specimens	2017	HEC NRPU	Rs. 8.948,659 M
14	Prof. Dr. Muhammad Mushtaq	Assessment of Yeast Species Efficacy for the Biological Control of Post-Harvest Fungal Diseases of Fresh Fruits of Balochistan	2015	PSF Pakistan	Rs. 3,615,084 M
15	Prof. Dr. Muhammad Mushtaq	Molecular characterization of pathogenic fungi form pomegranate fruits	2016	ORIC/BUITEMS	Rs. 200,000
16	Prof. Dr. Muhammad Mushtaq	Studies on the Prevalence of Pathogenic Fungi of Fresh Fruits of Balochistan	2015	ORIC/BUITEMS	PKR 150000
17	Prof. Dr. Muhammad Mushtaq	Molecular Characterization of Human Pathogenic *Candida* Species Associated with (UTI) Urinary Tract Infection	2015	ORIC/BUITEMS	Rs. 160,000
18	Prof. Dr. Muhammad Mushtaq	PCR Based Identification of Human Pathogenic Yeasts Associated with Clinical Specimens	2013	ORIC-BUITEMS	Rs. 155,000
19	Prof. Dr. Abdul Wali Tareen	Identification of Disease Causing Genes in Xeroderma Pigmentosum Patients	2017-2018	ORIC-BUITEMS	PKR. 0.163 M

List of Completed Projects (Biotechnology)

Completed Projects					
S. No.	**Principle Investigator**	**Title**	**Duration**	**Funding Agency**	**Cost**
20	Prof. Dr. Abdul Wali Tareen	Identification of genes responsible for autosomal recessive monogenic disorders in the Pakistani population	2016-2017	HEC	PKR. 0.453 M
21	Prof. Dr. Abdul Wali Tareen	Mapping of Candidate Genes in Nail Dysplasia from Balochistan	2016-2017	ORIC-BUITEMS	PKR. 0.196 M
22	Prof. Dr. Abdul Wali Tareen	Sequencing of candidate genes in families suffering from splithand/foot malformation	2015-2016	ORIC-BUITEMS	PKR. 0.195 M
23	Prof. Dr. Abdul Wali Tareen	Genetic linkage studies in autosomal recessive hypohidrotic ectodermal dysplasia families	2014-2015	ORIC-BUITEMS	PKR. 0.169 M
24	Prof. Dr. Abdul Wali Tareen	Identification of Genes in Pakistani Families with Dowling-Degos Disease	2014-2015	Humboldt Foundation , Germany	Euro. 6,500
25	Prof. Dr. Abdul Wali Tareen	Mapping of Candidate Genes in Families with Primary Microcephaly	2011-2012	ORIC-BUITEMS	PKR. 0.10 M
26	Prof. Dr. Nazeer Ahmed	DNA-Based Biodiversity Inventories of Juniper Forest Ecosystem in Ziarat; Quetta and Kalat Districts	2021	PARC	
27	Prof. Dr. Haleema Sadia	Expression studies of Colon Cancer Associated Transcript-1 (CCAT-1) Long coding RNA in Colon Cancer Patients of Pakistan by Real Time PCR	2020-2020	ORIC-BUITEMS	PKR 200,000
28	Prof. Dr. Shahjahan Shabbir Ahmed	DNA based identification of Mistletoes existing in Juniper ecosystem of Ziarat and suggesting its control strategies	2016-2017	ORIC-BUITEMS	PKR 0.2 M
29	Prof. Dr. Shahjahan Shabbir Ahmed	Recombinant DNA Technology for gene cloning via pUC18 vector	2017-2018	ORIC-BUITEMS	PKR 0.2 M
19	Prof. Dr. Abdul Wali Tareen	Identification of Disease Causing Genes in Xeroderma Pigmentosum Patients	2017-2018	ORIC-BUITEMS	PKR. 0.163 M
30	Prof. Dr. Shahjahan Shabbir Ahmed	Identification of reference genes suitable for qRT-PCR in Olive (Olea europaea L.) of Balochistan	2018-2019	ORIC-BUITEMS	PKR 0.2 M
31	Dr. Nusrat Jahan	USDA-funded in-kind Grant Award: Pakistan Agriculture Cold Chain Development	2021	USDA	USD66, 000

List of Completed Projects (Biotechnology)

Completed Projects					
S. No.	**Principle Investigator**	**Title**	**Duration**	**Funding Agency**	**Cost**
32	Dr. Nusrat Jahan	Fine mapping of QTLs linked with drought tolerance in rice genotypes at vegetative phase	2021	SRGP-HEC	PKR 0.5 M
33	Dr. Nusrat Jahan	Use of Microsatellite Markers to evaluate the Hybridity in Titicum astivum L. F1 Cultivars	2021	ORIC-BUITEMS	PKR 0.2 M
34	Dr. Nusrat Jahan	Development and commercialization of transgenic potatolines tolerant to fungi and viruses	2021	HEC	8.282 Million

DEPARTMENT OF MICROBIOLOGY

DEPARTMENT OF MICROBIOLOGY

Introduction

Microbiology is the systematic study of the structures, functions, uses and modes of existence of organisms which are too small to be seen with naked eyes i.e., bacteria, algae, protozoa, fungi and acellular agents like viruses and prions. These microorganisms are cosmopolitan in distribution and play vital role in their particular ecological niches due to their wide physiological activities. They are integral part of modern biotechnology, agricultural industries, environmental protection and production of medicines. On the contrary, they are important pathogens of plants and animals including humans, hence became the major focus of scientists for their diagnostics and control strategies.

Scope

The degree programs of Microbiology are designed to train the students in microbiological techniques and to give an insight in the applied areas of the subject and their relationship with other life sciences disciplines. Microbiology is essential for health sciences, agriculture, environment, marine sciences, and rapidly growing biotechnology industry. This integration of microbiology is vital in all disciplines of life and is opening the doors for our graduates to different professional fields. They can work as scientists in research organizations, as clinical laboratory professionals, as microbiologists in food processing industries and as technologists in bio-medical equipment providing companies as well as academicians in public and private sector universities.

Degree Courses Offered

1. BS (Microbiology)

Eligibility/ Prerequisite Qualification:
Twelve years education with biology and chemistry or equivalent

Maximum Students per Semester	50
Total numbers of Credit Hours	134
Duration	4 years
Semester duration	16-18 weeks
Semesters	8
Course Load per Semester	15-18 Cr hr
Number of courses per semester	4-6

Scheme of Study for 4-year Bachelor of Science (BS) in Biotechnology

Semester 1

Type	Course Code	Course Titles	Credit Hours
Compulsory	HUM-163	Functional English	3+0
Compulsory	HUM-102	Pakistan Studies	2+0
Compulsory	MATHA-114	Mathematics- I (Algebra)	3+0
General-I	BIOCHEM-202	Biochemistry-I	2+1
General-II	PHYSIOL-101	Human Physiology-I	2+1
Foundation-I	MICRBIOL-102	Fundamentals of Microbiology-I	3+1
		Total Credit Hours	**18**

Semester 2

Type	Course Code	Course Titles	Credit Hours
Compulsory	HUM-268	Communication skills	3+0
Compulsory	HUM-101/112	Islamic Studies / Ethics	2+0
Compulsory	MATHA-115	Mathematics-II (Calculus)	3+0
General-III	BIOCHEM-404	Biochemistry-II	2+1
General-IV	PHYSIOL-202	Human Physiology-II	2+1
Foundation-II	MICRBIOL-203	Fundamentals of Microbiology-II	3+1
		Total Credit Hours	**18**

Semester 3

Type	Course Code	Course Titles	Credit Hours
Compulsory	CS-101(666715)	Introduction to Computer	2+1
Compulsory	HUM-265	Technical Writing and Presentation Skills	3+0
General-V	GENET-301	Genetics	2+1
General-VI	ECOLOGY-202	Ecology and Ecosystem	2+1
Foundation-III	MICRBIOL-308	Microbial Taxonomy	2+1
Foundation-IV	BIOTECH-203	Fundamentals of Biotechnology	2+1
		Total Credit Hours	**18**

Semester 4

Type	Course Code	Course Titles	Credit Hours
General-VII	BIOL-205	Biodiversity of Animals	2+1
General-VIII	ENVIRON-303	Current Environmental Issues	3+0
Foundation-V	VIROL-201	General Virology	2+1
Foundation-VI	BIOL-301	Cell Biology	2+1
Foundation-VII	MYCOL-201	Mycology	2+1
		Total Credit Hours	**15**

Semester 5

Type	Course Code	Course Titles	Credit Hours
Foundation-VIII	BIOSAFE-302	Biosafety and risk management	3+0
Foundation-IX	IMMUNOL-302	Immunology	2+1
Major-I	MICRBIOL-310	Microbial Anatomy & Physiology	2+1
Major-II	EPIDEMO-301	Epidemiology	2+1
Major-III	MOLBIOL-301	Molecular Biology	2+1
		Total Credit Hours	**15**

Semester 6

Type	Course Code	Course Titles	Credit Hours
Foundation-X	METHOD-302	Research Methodology	3+0
Major-IV	MICRBIOL-402	Soil Microbiology	3+1
Major-V	MICRBIOL-309	Food Microbiology	2+1
Major-VI	MICRBIOL-307	Fresh Water Microbiology	2+1
Major-VII	BACTRIOL-401	Clinical Bacteriology	3+1
		Total Credit Hours	**17**

2. MS (Microbiology)

Eligibility/ Prerequisite Qualification:
BS Microbiology or equivalent degree with CGPA ≥ 2.0 or Minimum 16 years of education in Life Sciences discipline with 50% marks.

Maximum Students per Semester	24
Total numbers of Credit Hours	30
Duration	2 years
Semester duration	16-18 weeks
Semesters	4
Course Load per Semester	9-18 Cr hr
Number of courses per semester	3-6

Scheme of Study for Master of Science (MS) in Microbiology

Semester 1

Course Type	Course Code	Course Titles	Credit Hours
Core		Microbial Biology and Systematics	3+0
Core		Instrumentation and Bio-analytical Techniques	3+0
Elective		Elective –I	3+0
Elective		Elective –II	3+0
		Total Credit Hours	**12**

Semester 2

Course Type	Course Code	Course Titles	Credit Hours
Core		Genomics and Proteomics	3+0
Core		Research Methodology	3+0
Elective		Elective –III	3+0
Elective		Elective –IV	3+0
		Total Credit Hours	**12**

Semester 3

Course Type	Course Code	Course Titles	Credit Hours
Research		Research and Thesis	Continued in 4th semester

Semester 4

Course Type	Course Code	Course Titles	Credit Hours
Research		Research and Thesis	6
		Total Credit Hours	**06**

Total Credit Hours: 30

Research Report will be completed and assessed in 4th Semester.

List of Elective Courses for MS Microbiology

Elective courses for first 2 semesters will be selected and offered by the department from the following list of elective courses each with a weightage of three (3) credit hours is hereby presented:

Advance Microbiology

Advance Bacteriology
Advance Mycology
Advance Parasitology
Advance Virology

Semester 7

S. No	Course Code	Course Titles	Credit Hours
Major-VIII	MICRBIOL-406	Molecular Mechanism of Antimicrobial Drugs	3+1
Major-IX	MICRBIOL-304	Marine Microbiology	2+1
Major- X	BIOCHEM-430	Genetics Engineering	3+1
Elective-I	MICRBIOL-404	Medical Microbiology	2+1
Elective-II	IMMUNOL-400	Applied Immunology	2+1
Major-VIII	MICRBIOL-406	Molecular Mechanism of Antimicrobial Drugs	3+1
		Total Credit Hours	**17**

Semester 8

S. No	Course Code	Course Titles	Credit Hours
Major-XI	GENET-402	Bacterial Genetics	3+1
Major-XII	THESIS-401	Research Project/ Internship	0+6
Elective-III	STAT-401	Biostatistics	2+1
Elective-IV	BIOL-402	Plant Pathology	2+1
Major-XI	GENET-402	Bacterial Genetics	3+1
Major-XII	THESIS-401	Research Project/ Internship	0+6
		Total Credit Hours	**16**

*Credit hours included in semester 8

Total Credit Hours: 134

List of Elective Courses for BS Microbiology

1. Microbial Enzyme Technology.
2. Bioinformatics and Protein Structure/Function.
3. Advances in Soil Microbiology.
4. Environmental Microbiology and Public Health.
5. Diagnostic Chemistry for Microbial Diseases.
6. Veterinary Microbiology.
7. DNA Damage, Repair and Carcinogenesis.
8. Management of Infectious Waste.
9. Advances in Microscopy and image analysis
10. Nano-biotechnology.
11. Structural and computational Biology.
12. Industrial Microbiology
13. Epigenetics
14. Biostatistics (Proposed)
15. Medical Microbiology (Proposed)
16. Plant Pathology (proposed)

List of Elective Courses for MS Microbiology

Microbial Metabolic Regulation
Advance Molecular Microbiology
Advance Microbial Physiology

Agriculture Microbiology

Advance Plant Pathology
Advance Veterinary Microbiology
Control of Plant Microbial Diseases
Current development in Plant Diseases Diagnosis
Pathogens of Aquatic Animals
Pathogens of Plant Diseases
Plant viral Diseases

Clinical Microbiology

Advance Immunology
Advance Medical Mycology
Clinical Molecular Diagnostics
Molecular Mechanism of Anti-microbial drugs
Epidemiology: Analytical & expedited Approaches
Molecular Pathogenesis
Vaccinology

Food and Environmental Microbiology

Microbial Pollution and Waste Management
Microbiology of Soil and Bioremediation
Public Health Microbiology
Current Advances in Food Preservation and Packaging
Food Borne Diseases
Advance Dairy Microbiology

Industrial and Pharmaceutical Microbiology

Bioreactors & Biosensors
Fermentations and its industrial applications
Industrial Microbiology
Pharmaceutical Microbiology
Innovations in Microbial Fermentation Technology
Microbial Enzyme Technology
Microbial Strain development for Industry

Microbial Omics

Microbial Genomics and Bioinformatics
Microbial Transcriptomics and Bioinformatics
Microbial Proteomics and Bioinformatics
Microbial Systems Biology
Microbial Patho-informatics
Microbial Molecular Systematics
Computer Aided Drug Designing
Microbial Phylogenomics

FACULTY PROFILE

Department of Microbiology

FACULTY PROFILE (Microbiology)

Prof. Dr. Asma Yousafzai
Chairperson/Professor

Dr. Asma Yousafzai working as a Professor and Chairperson of Microbiology Department, ensured PhD in "Mutational analysis of high risk genes (BRCA1and BRCA2) in Breast Cancer Cases from Balochistan" BUITEMS, Quetta. In addition, she has BUITEMS Quality & Excellence in Education, conducted many workshops and trainings for university faculty members as a Master Trainer at various trainings in Professional Competency Enhancement Program for Teachers (PCEPT), under the Project of NAHE (Phase II) organized by Higher Education Commission, Islamabad. An eminent member of Floriculture project and American Society of Plant Biologists as well as Pakistan Biological Safety Association. She is responsible for the academic, administrative and personal grooming of the individual overall. Being a member of the Student Affairs Office promoting co-curricular activities and positive learning. She has performed these responsibilities before with distinction. Besides the above boardroom and leadership experience, she has received several awards and recognitions at national and regional levels. She is very passionate about higher education and would like to make more contribution to higher education in Balochistan the largest and premier province. By virtue of her training in Biological Sciences, Human Genetics and Cancer research. She has a lot of experience in the research related to breast cancer, as a key speaker, she has spread the awareness on Breast Cancer in various seminars. She is also author and co-author of 25 research articles published in international and national journals. She has expertise in Molecular based diagnosis of several infectious diseases as well as molecular genetic studies of inherited diseases. She is planning to work and mentor teams towards having state of the art including facilities to support the core functions of teaching and learning, research and innovations and knowledge transfer partnerships and networking. She has vast knowledge and experience in the various ranking criteria for higher education institutions.

Dr. Kaleem U. Kakar
Associate Prof.

Dr. Kaleem Kakar joined BUITEMS as Assistant professor in 2019. He did his PhD from Zhejiang University (QS ranking #45) in 2014, M.Phil. from Quaid-i-Azam University, and Masters' in Biotechnology from BUITEMS, Quetta. He has also completed a post-doctoral fellowship from Zhejiang University, and served as Foreign Expert Scientist at Molecular Genetics Key Laboratory of China Tobacco, Guizhou Academy of Tobacco Science – Guiyang, China. His research work focuses on Biological control of Plant diseases and yield improvement in major food crops, and identification of novel stress-responsive gene families in prokaryotic and eukaryotic genomes. Additionally, he is involved in multi-/interdisciplinary research in the areas of Bioinformatics, Genomics, Plant Pathology, Plant-microbe-interaction, Epigenetics and Molecular Biology. He has published more than 30 international research articles, and is the author of a book entitled "Cosmetic Herbs" available on Amazon. He is working in collaboration with Department of Plant Pathology and Ecology, The Connecticut Agricultural Experiment Station (USA), Molecular Genetics Key Laboratory of China Tobacco, Guizhou Academy of Tobacco Science (China), Department of Biological Sciences, Albaydaa University (Yemen), Department of Crop Protection, Faculty of Agriculture, University of Maiduguri (Nigeria), Guizhou university, and Northwest A&F University (China). He is HEC recognized PhD supervisor and member of Pakistan Biosafety Association.

Dr. Faiz Muhammad
Associate Prof.

Faiz Muhammad is working as Assistant Professor in Department of Microbiology BUITEMS, Quetta Pakistan. He did his PhD in Microbiology from University of Karachi in 2018. His area of research is molecular and immunological aspect of mycoplasmas and viruses. He has numerous publication in the field. He has been associated with the field of microbiology since 2013.

He is the member of American Society for Microbiology (ASM) and Pakistan Society of Microbiology (PSM). I have completed my PhD thesis in September, 2017. I resume my job on October, 2017. I worked on Diagnosis of avian Mycoplasmosis and their Control under the supervision of Prof. Dr Aqeel Ahmad (Pakistan) and Prof. Dr. Chang (USA). In which I developed some new diagnostic methods for rapid diagnosis of the disease. For control I found some natural and synthetic chemical compound for future chemotherapy against the disease. Moreover, some local isolates of low virulent strain of avian mycoplasmas were biological characterized by control infection in experimental birds in laboratory for vaccine strain. During my worked, I found Dr. Aqeel as kind, sympathetic, inspiring and scholastic guidance and ever encouraging attitude for adopting new techniques. I enjoyed a lot during my visit to Dr Chang's laboratory (USA) for his skillful guidance, learned patronage, unfailing patience, and to work with patience and consistency on scientific logics.

Dr. Asif Raheem
Assistant Professor

Dr. Asif Raheem did his Masters' in Biotechnology from Department of Biotechnology and informatics, Balochistan University of Information Technology, Engineering and Management Sciences, (BUITEMS) Quetta and M.Phil. leading to PhD from Department of Microbiology and Molecular Genetics, University of the Punjab, Lahore, Pakistan. He investigated the microbial diversity and molecular studies of rhizobacteria particularly under salt and drought stress. He has also explored Probiotic bacteria and characterized them to use as a probiotics. His areas of interests are Microbial and molecular genetics of rhizbacteria particularly genes responsible for alleviation of drought and salt stress. He is also working in the area of antimicrobial resistance particularly genes responsible for antibiotics resistance. He has more than 15 publications in journals of national and international repute. He is working with national and international collaboration particularly Lancaster environment center (LEC), University of Lancaster, United Kingdome and Laboratory of Rhizosphere Microflora, All-Russia Research Institute for Agricultural Microbiology, Russian Federation. He joined BUITEMS as Assistant Professor of Microbiology in 2019.

Dr. Anwar Khan
Assistant Professor

He completed postdoctoral studies at the University of Edinburgh in the United Kingdom and a Ph.D. in molecular biology at the University of Punjab. As a visiting scholar at Ohio State University in the United States, I worked in the Plant Pathology department.
The research focuses on the molecular mechanisms of viral and fungal pathogenicity, as well as plant defence against these organisms. The three main research areas are: 1) using RNAi to determine the outcome of host-virus interactions, 2) developing and applying tools based on viral vectors to assess gene function in crop plants, and 3) biocontrol of fungal phytopathogens using indigenous microbes.
Following projects are funded by Higher Education Commission of Pakistan to our lab (Applied Biotechnology):

1. The development and of transgenic potato lines tolerant to fungi and viruses.
2. The Development and commercialization of a broad spectrum bio-formulated fungicide.
3. Complete genome sequence of PVX isolate of Pakistan.

Dr. Muhammad Rafiq (on study leave)
Assistant Professor

Dr. Muhammad Rafiq, a Commonwealth Rutherford Fellow, joined the Department of Microbiology, BUITEMS, in 2019 as an Assistant Professor. He earned his Ph.D. from Quaid-i-Azam University, Islamabad and his post-doctorate from the University of Bristol, UK. His Ph.D. research was related to "Culture dependent and metagenomic study of microbial diversity of glaciers in Hindu Kush Karakoram Himalaya (HKKH), Pakistan" Dr. Rafiq's research interests include 1) Microbial ecology and diversity (taxonomic and functional) of extreme environments via culture-dependent and metagenomics approaches with special emphasis on psychrophiles; 2) Molecular mechanisms of adaptation in extremophilic microbes; 3) Microbial interaction in psychrophilic habitats and their positive and negative impacts on climate and other ecological setups;

4) Bioprospecting and exploring extremophilic microbes for a variety of industrially important metabolites; 5) Antibiotic resistant pattern and evolution in isolates from natural and unanthropogenic environments. He is a member of the Board of Studies of Abdul Wali Khan University, Mardan, and the Board of Faculty of Iqra National University Peshawar.

Dr. Saadullah Malghani
Assistant Professor

Dr. Saadullah has joined BUITEMS in 2018 and serving as an assistant professor in the department of Microbiology. In 2017, he has completed PhD from department of Botany, GC University, Lahore. His M.Phil is also from the same university. His area of research interest is DNA barcoding of Plants, Molecular Genetics, Plant Taxonomy, & Ethnoboatny. During his PhD research work, in collaboration with NIBGE, Faisalabad and University of Guelph, Canada, he has sequenced 1023 DNA barcodes (rbcl & matK) of 235 plant species of district Dera Ghazi Khan. With this research work, district Dera Ghazi Khan has become the first district of Pakistan of which almost all major flora is digitalized at molecular level and is the part of the international gene bank BOLD (Barcode of Life Data Systems). He has also documented the ethnobotanical importance of all above mentioned plant species. He has published research paper in various national and international journals. Dr. Saadullah has participated and presented papers in various national and international conferences.

Ms. Samia Parveen
Assistant Professor

She did her Masters in Clinical Microbiology (Gold Medal) from Shah Abdul Latif University Khairpur Mir's Sindh. She has completed her MS in Biotechnology & Informatics from BUITEMS. She joined BUITEMS as a Research Associate in 2006 and now is serving as an Assistant Professor in department of Microbiology. She has six years teaching experience in Higher Secondary Classes as well. Her field of interest is in Environmental Microbiology. She has research publications in plant related as well as Microbial related and antibacterial activities of different materials. Currently she is enrolled in PhD Biotechnology.

Mr. Ashiq Khan Nasar (on study leave)
Assistant Professor

Ashiq Nasar has received his MSc and M.Phil degree in Microbiology from Quaid-e-Azam University, Islamabad. He joined BUITEMS as a lecturer (Microbiology) in January 2013. Before, joining BUITEMS, he worked for one year as a microbiologist in the National TB control program Islamabad. Currently, he is working as an Assistant Professor in the Department of Microbiology and completing his Ph.D. (Microbiology) studies from China. He has published many research articles in reputable international Journals. His research interest includes; Food Microbiology (Probiotics), its applications in gut microbiota-associated disorders (NAFLD, IBD), Antimicrobial Resistance (AMR), and other infectious diseases (MTB).

Dr. Mahrukh Naudhani
Assistant Professor

Miss Mahrukh Naudhani is serving as an assistant professor at Department of Microbiology since December 2013. Miss Mahrukh did her Masters in Molecular Biology from Center of Excellence in Molecular Biology, University of The Punjab, Lahore and currently perusing PhD in Food microbiology. Her interests included gut microbiota modulation and natural prebiotic compounds, Detecting mutations in HCV virus genes.

Ms. Maliha Rehman
Lecturer

Maliha Rehman is a Lecturer in the Department of Microbiology. She joined BUITEMS in 2017 as Lecturer. She obtained her MPhil Degree from Quaid-i-Azam University Islamabad. Her research was on "Physiological characterization and phylogenetic analysis of bacteria isolated from Grotte di San Giovanni, a Limestone Cave in Italy." Her Master's degree is also from Quaid-i-Azam university Islamabad. She has research experience with techniques and bioinformatics tools used in molecular microbiology and recombinant DNA technology from COMSATS Institute of Information Technology Islamabad and National Agriculture Research Center Islamabad (NARC) in project NIGAB. She has expertise in microbial isolates, enzymology, antibiotic production studies from microbes, and antimicrobial resistance.

Mr. Sumair Khan
Lecturer

Mr. Sumair Khan has been serving as a Lecturer since 2018 in the Department of Microbiology at BUITEMS Quetta. He completed his MSc and M. Phil in Microbiology from Quaid-I-Azam University Islamabad. His research focuses on Combating Antibiotics Resistance, Novel strategies against superbugs, Surveillance, and Molecular Mechanism of Antibiotics Resistance. He and His team worked on SARS-CoV-2 and recently published their work in International Journal. Besides these, he is skilled in adapting to the environment and diverse research & learning styles.

3. Complete genome sequence of PVX isolate of Pakistan.

Ms. Maryam Siddique
Lecturer

Maryam Siddique did her BS from University of Balochistan in 2012. She did her M.Phil. in Microbiology from CASVAB, University of Balochistan. Her research work was on the molecular studies of Mycoplasma capricolum sub-specie Capripneumonia using PCR and RFLP techniques. She has also served in Department of Biotechnology, Sardar Bahadur Khan Women University for 3 years.

Mr. Syed Inayat Ullah Agha
Lab Supervisor

Syed Inayat Ullah Agha is laboratory supervisor in Department of microbiology since 2017. he did MSc in Microbiology from University of Balochistan Quetta and MS in Biotechnology and Informatics from BUITEMS. He also did MBA executive with specialization in human resource management from BUITEMS. His core area of interest is antimicrobial agents and biocontrol agents. He is the member of American Society for Microbiology (ASM), American Academy of Forensic Science (AAFS), Pakistan Society for Microbiology (PSM), Biological Safety Association 0f Pakistan (BSAP), Pakistan Science Mission (PSM) and Biorisk management (BRM) Pakistan. He presented his research work in several international conferences. He has published research articles in journals having impact factor.

Faculty on Study Leave (Microbiology)

Mr. Sanaullah Tareen
Assistant Professor

Mr. Ashiq Khan
Assistant Professor

Dr. Muhammad Rafiq
Assistant Professor

Ms. Javeria Ayub
Lecturer

Ms. Syeda Hafsa Ali
Lecturer

Ms. Jamila Tabassum
Lecturer

Research and Laboratories (Microbiology)

Research and Laboratories

Microbiology General Lab

The Microbiology General Laboratory is used for microbiology practical and research work. This lab is also used for clinical analysis and blood biochemistry. The lab contains the equipment of clinical analyzer, hematological analyzer, ELISA, compound microscope, laminar air flow, incubator, many kits and chemicals related to the equipment. The students of BS and MS Microbiology perform their research work under the assigned supervisors in the lab. Microbial (bacteria virus and fungi) related research work is performed as well in the lab. Furthermore, Biosafety and Biosecurity procedures are followed and Information regarding the same is displayed in the lab as well. Lastly the Logbook of the equipment and chemicals are maintained.

Applied Biotechnology/Microbiology Lab

In Applied Biotechnology / Microbiology Lab at BUITEMS, students have the opportunity to practice and advance their microbiology skills by collecting, isolating, and characterizing microbes from food, water, and soil samples. The lab will also introduce students to various growth media used in medical and environmental microbiology labs. Students will also have the opportunity to work independently on a semester project isolating unknown microbes and establishing a culture collection for further analysis.
Following projects are funded by Higher Education Commission of Pakistan to our lab (Applied Biotechnology):

1. The development and of transgenic potato lines tolerant to fungi and viruses.
2. The Development and commercialization of a broad spectrum bio-formulated fungicide.
3. Complete genome sequence of PVX isolate of Pakistan.

Microbiology General Lab (Lab equipment)

S. NO.	Items	Quantity	Working
1	Laminar Flow cabinet	1	Yes
2	Microscopes	1	Yes
3	Monitor assisted microscope	1	Yes
4	Microwave oven	1	Yes
5	Colony counter	1	Yes
6	Photometer	1	Yes
7	Electronic weighing balance	1	Yes
8	Automated EIA analyzer	1	Yes
9	Spinlab Spinreact	1	Yes
10	Celtac f (Nihon Cohden) hematology analyzer	1	Yes
11	Incubator	1	Yes
12	Egg Incubator	1	Yes

List of On-going Projects (Microbiology)

S. No	Title of Research Proposal	Name of PI	Department	Amount Approved (Millions Rs.)	Duration of Project	Sponsoring Agency
1	Development and commercialization of transgenic potato lines tolerant to fungi and viruses	Dr. Anwar Khan Assistant Professor	Department of Microbiology	8.282	2018-2021	TDF
2	Development and commercialization of broad spectrum bio-formulated fungicide	Dr. Anwar Khan Assistant Professor	Department of Microbiology	2.441	2018-2021	TDF
3	SRGP HEC “Complete genome sequence of PVX isolate of Pakistan”	Dr. Anwar Khan Assistant Professor	Department of Microbiology	0.5	2018-2021	SRGP HEC
4	Computerized Disease Registry for Chronic Disease in Balochistan	Dr. Jeneen Panezai Assistant Professor	Department of Microbiology	8.756	2022-2024	NRPU
5	Human biomonitoring and health parameters associated with groundwater exposure in Balochistan	Dr. Jeneen Panezai Assistant Professor	Department of Microbiology	0.5	2021-2024	OLG
6	CRISPR-Cas9-based mutagenesis for the attenuation of Mycobacterium avium subspecies paratuberculosis (MAP) as a vaccine candidate	Dr. Faiz Muhammad Assistant Professor	Department of Microbiology	4.227	2022-2024	NRPU
7	**Bio-Surveillance and GIS mapping Balochistan Bases**	**Dr. Faiz Muhammad Assistant Professor**	**Department of Microbiology**	**0.2**	**2022**	**NESCOM**
8	Epidemiology and Risk assessment of antimicrobial-resistant pathogenic Escherichia coli carriage in sympatric humans and livestock of flood affected areas of Balochistan	Dr. Kaleemullah Kakar Associate Professor	Department of Microbiology	2.5	2023	National Institute of Health – Health Research Institute (NHRI)

DEPARTMENT OF ENVIRONMENTAL SCIENCE

DEPARTMENT OF ENVIRONMENTAL SCIENCE

Introduction

Environmental science is interdisciplinary area of subject involving different fields of studies. In Environmental Science, Biologists, Ecologists, Geologists, Chemists, Physicists, Engineers, Mathematicians, Computer Scientists and Biomedical experts synchronously work to investigate environmental issues, their underlying causes and their health implications on humans and biota. This unique juxtaposition of several sciences in one department fosters cooperation and exchange among traditional disciplines that share similar methodological and philosophical problems. An environmental scientist also has understanding of economics, sociology and political science to effectively understand the complex interaction of humans with the environment to develop policies and to communicate with the government for sustainable development and natural resource management. Department of Environmental Science at BUITEMS is committed to excellence in teaching, research and service to the community and policy makers.

Scope

There is significant demand for environmental scientists to monitor environmental quality, interpret the impact of human actions on ecosystems, sustainable use of natural resources and develop strategies for restoring damaged and deteriorating ecosystems. This interdisciplinary science opens great many opportunities for our graduates in diverse fields of industry, academia, natural resource management, disaster management and public health.

Degree Courses Offered

1. BS (Environmental Science)

Pre-requisite: Intermediate (Pre-medical/Pre-engineering or equivalent with 45% marks or DAE in Civil, Petroleum & Gas, Chemical).

Scheme of Study for 4-year Bachelor of Science (BS) in Environmental Science

Semester 1

Sr. No.	Course Code	Course Title	Credit Hours
1	ENVIRON-101	Introduction to Environmental Science	3 (3-0)
2	BIOL-202	Biology-I	3 (2-1)
3	CHE-106	Basic Chemistry	3 (2-1)
4	MATHA-114	Mathematics	3 (3-0)
5	ENG-161	English-I	3 (3-0)
6	HUM-102	Pakistan Studies	2 (2-0)
		Total Credit Hours	**17**

Semester 2

Sr. No.	Course Code	Course Title	Credit Hours
7	GEOE-101	Introduction to Earth Science	3 (2-1)
8	BIOL-304	Fundamentals of Biology-II	3 (2-1)
9	MATHA-201	Statistics	3 (3-0)
10	HUM-272	Sociology/Anthropology	3 (3-0)
11	ENG-261	English-II	3 (3-0)
12	HUM-101/HUM-112	Islamic Studies / Ethics	2 (2-0)
		Total Credit Hours	**17**

Semester 3

Sr. No.	Course Code	Course Title	Credit Hours
13	CS101	Introduction to Computer	3 (2-1)
14	CHE-203	Environmental Chemistry	3 (2-1)
15	PHY-431	Environmental Physics	3 (2-1)
16	ECON-204	Introductory Economics	3 (3-0)
17	ENG-361	English-III	3 (3-0)
18	HUM-107	Introduction to Philosophy	3 (3-0)
		Total Credit Hours	**18**

Semester 4

Sr. No.	Course Code	Course Title	Credit Hours
19	BIOTECH-203	Fundamentals of Ecology	3 (3-0)
20	MICRBIOL-306	Environmental Microbiology	3 (2-1)
21	ENVIRON-201	Environmental Pollution	3 (3-0)
22	ARCH-142	Climatology	3 (3-0)
23	HUM-138	Introduction of Psychology	3 (3-0)
19	BIOTECH-203	Fundamentals of Ecology	3 (3-0)
		Total Credit Hours	**15**

Semester 5

Sr. No.	Course Code	Course Title	Credit Hours
24	Biotech-310	Applied Ecology	3 (2-1)
25	TOXICOL-201	Environmental Toxicology	3 (2-1)
26	ENVIRON-301	Environmental Profile of Pakistan	3 (3-0)
27	ENVIRON-323	Population and Environment	3 (3-0)
28	ENVIRON-321	Analytical Techniques in Environmental Science	3 (1-2)
29	ENVIRON-446	Elective-I	3 (2-1)
		Total Credit Hours	**18**

Semester 6

Sr. No.	Course Code	Course Title	Credit Hours
30	IT-316	GIS & Remote Sensing	3 (2-1)
31	ECON-401	Environmental Economics	3 (3-0)
32	BIOL-304	Biodiversity & Conservation	3 (3-0)
33	ENVIRON-441	Environmental Monitoring	3 (3-0)
34	ENVIRON-444	Environmental Management Systems	3 (3-0)
35	ENVIRON-342	Elective-II	3 (3-0)
		Total Credit Hours	**18**

Semester 7

Sr. No.	Course Code	Course Title	Credit Hours
36	ENVIRON-302	Climate Change	3 (3-0)
37	ENVIRON-443	Environmental Impact Assessment	3 (2-1)
38	RES-201	Research Methods in Environmental Science	3 (3-0)
39	ENVIRON-304	ELECTIVE-III	3 (3-0)
40	ENVIRON-305	ELECTIVE –IV	3 (2-1)
36	ENVIRON-302	Climate Change	3 (3-0)
		Total Credit Hours	**15**

Semester 8

Sr. No.	Course Code	Course Title	Credit Hours
42	ENVIRON-444	Environmental Governance	3 (3-0)
43	ENVIRON-402	Health and Environment	3 (3-0)
44	ENVIRON-401	Pollution Control Technologies	3 (3-0)
45	ENVIRON-495	Final Year Project/ Internship	6
42	ENVIRON-444	Environmental Governance	3 (3-0)
43	ENVIRON-402	Health and Environment	3 (3-0)
		Total Credit Hours	**15**

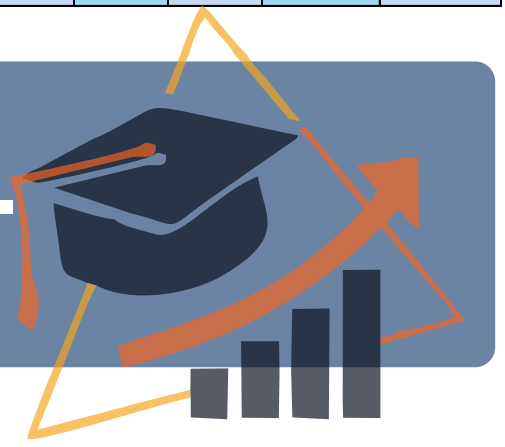
*Credit hours included in semester 8

Total Degree Credit Hours: 133

	Compulsory		General		Foundation		Major		Elective		Total	
	Courses	Credits	Courses	Credits	Courses	Credits	Courses	Credits	Courses	Credits	Courses	Credits
Semester I	3	8	2	6	1	3	0	0	0	0	6	17
Semester II	3	8	2	6	1	3	0	0	0	0	6	17
Semester III	2	6	2	6	2	6	0	0	0	0	6	18
Semester IV	0	0	1	3	4	12	1	3	0	0	6	18
Semester V	0	0	0	0	2	6	2	6	2	6	6	18
Semester VI	0	0	0	0	0	0	4	13	1	3	5	16
Semester VII	0	0	0	0	1	3	4	12	0	0	5	15
Semester VIII	0	0	0	0	0	0	3	12	1	3	4	15
Total	**8**	**22**	**8**	**24**	**10**	**32**	**12**	**44**	**4**	**12**	**42**	**134**

Total Courses: 42

Total Credit Hours: 133



List of Elective Courses for BS Environmental Science

SR. NO.	COURSE CODE	COURSE TITLE	CREDIT HOURS
1	ENVIRON-446	Water Resources Management	3(2-1)
2	ENVIRON-304	Hydrology	3(3-0)
3	ENVIRON-305	Occupational Health and Safety	3(2-1)
4	ENVIRON-405	Solid Waste Management	3(3-0)
5	ENVIRON-343	Ecotourism	3(3-0)
6	ENVIRON-306	Air and Noise Pollution	3(3-0)
7	ENVIRON-406	Soil and Environment	3(3-0)
8	ENVIRON-447	Disaster Risk Management	3(3-0)
9	ENVIRON-461	Pollutant Movement in Soil	3(3-0)
10	ENVIRON-448	Energy and Environment	3(3-0)
11	ENVIRON-407	Agro-ecology	3(3-0)
12	BIOTECH-432	Environmental Biotechnology	3(3-0)
13	ENVIRON-408	Project Management	3(3-0)
14	ENVIRON-409	Environmental Impact Analysis	3(3-0)
15	ENVIRON-342	Urban Environmental Management	3(3-0)
16	ENVIRON-449	Coastal Environmental Management	3(3-0)

1. MS (Environmental Science)

Scheme of Study for Master of Science (MS) in Environmental Science

Degree Requirements for MS Environmental Science:

Candidate having degree in M.Sc. Biological/Chemical/Environmental Science with 60% marks or BS in or Biological/Chemical/Environmental Science with CGPA ≥ 2.5 will be eligible for admission in MS Environmental Science.

Scheme of Studies for MS Environmental Science (2 Years):

- This degree program will fulfill all the necessary curriculum requirements for MS in Environmental Science as recommended by Higher Education Commission (HEC) comprising compulsory, general, foundation , major and elective courses.
- The students will have to complete 24 credit hours course work in the first two semesters and will have to conduct research work of 6 credit hours in the last two semesters.

Following scheme of study for MS Environmental Science was recommended:

Semester	Course code	Course Title	Credit Hours
1st Semester	ENVIRON-685	Research Methods in Environmental Science	3 (3-0)
	ENVIRON-619	Global warming, Climate Change Adaptation and Mitigation	3 (3-0)
		ELECTIVE –I	3
		ELECTIVE –II	3
Total Credit Hours			**12**
2nd Semester	ENVIRON-645	Environmental Analytical Techniques	3 (2-1)
	ENVIRON-618	Environmental Impact Assessment and Strategic Environmental Assessment	3 (3-0)
		ELECTIVE –III	3
		ELECTIVE –IV	3
Total Credit Hours			**12**
3rd & 4th Semester	THESIS-601	Thesis	6

List of Elective Courses for MS Environmental Science

Sr.No.	Course Code	CourseTitle	Credit Hours
1	ENVIRON-691	Environmental Risk Assessment and Management	3 (3+0)
2	BIOL-506	Wildlife and Forest Conservation	3 (3+0)
3	BIOTECH-516	Environmental Biotechnology	3 (3+0)
4	CHE-551	Environmental Chemistry	3 (3+0)
5	CHE-601	Polymers and the Environment.	3 (3+0)

List of Elective Courses for BS Environmental Science

Sr.No.	Course Code	CourseTitle	Credit Hours
6	ECOLOGY-501	Freshwater Ecology / Limnology	3 (3+0)
7	ECOLOGY-502	Restoration Ecology	3 (3+0)
8	ECOLOGY-503	Urban Ecology	3 (3+0)
9	ENVIRON-504	Principles and Applications of Bioremediation	3 (3+0)
10	ENVIRON-542	Wetland management	3 (3+0)
11	ENVIRON-641	Laboratory Management Practices	3 (3+0)
12	ENVIRON-642	Marine Pollution Management	3 (3+0)
13	ENVIRON-643	Energy and Environment	3 (3+0)
14	ENVIRON-686	Treatment and Management of Wastewater	3 (3+0)
15	ENVIRON-687	Disaster Risk Management	3 (3+0)
16	ENVIRON-688	Environmental Education	3 (3+0)
17	ENVIRON-689	Gender and Environment	3 (3+0)
18	ENVIRON-692	Environmental Geology	3 (3+0)
19	HUM-501	Advance Environmental Sociology	3 (3+0)
20	IT-601	GIS and remote sensing	3 (3+0)
21	ENVIRON-690	Environmental Policy and Law	3 (3+0)
22	BIOL-505	Biological Conservation	3 (3+0)
23	CHE-641	Advanced Chromatography Techniques-I	3 (3+0)
24	ENVIRON-543	Sustainable Urban Planning and Management	3 (3+0)

1. PhD (Environmental Science)

Scheme of Study for PhD in Environmental Science

(For students having their terminal degree in basic, natural and applied sciences)

Degree Requirements for PhD Environmental Science:

Candidate having degree in MS/MPhil Biological/Chemical/Environmental Science with degree with CGPA ≥ 3 should also be made eligible for admission in PhD Environmental Science.

Scheme of Studies for PhD Environmental Science:

- This degree program will fulfill all the necessary curriculum requirements for PhD in Environmental Science as recommended by Higher Education Commission(HEC) comprising core and allied elective courses.
- The students will have to complete 18 credit hours course work in the first two semesters and will have to conduct research work for a minimum period of two years.
- Committee approved two schemes of studies for PhD. First scheme will be for those Students having their terminal degree in environmental sciences and second will be for those having their terminal degree in basic, natural and applied sciences (except environmental sciences)

Semester	Course Code	Course Title	Credit Hours
1st Semester	ENVIRON-706	Recent Trends in Environmental Science	3(3-0)
		ELECTIVE 1	3(3-0)
		ELECTIVE 2	3(3-0)
2nd Semester	ENVIRON-805	Climate Change and Adaptation	3(3-0)
		ELECTIVE 3	3(3-0)
		ELECTIVE 4	3(3-0)
		Total Credit Hours	18
Research Work for Thesis for a minimum period of two years			

List of Elective Courses for MS Environmental Science

Sr.No.	Course Code	Course Title	Credit Hours
1	ENVIRON-742	Health, Safety and Environmental Management	3 (3+0)
2	ENVIRON-743	Sustainable Development	3 (3+0)
3	BIOL-702	Conservation of Natural Resources	3 (3+0)
4	CHE-841	Advanced Chromatography Techniques –II	3 (3+0)
5	CHE-842	Environmental Application of Nanomaterials	3 (3+0)
6	ECOLOGY-701	Industrial Ecology	3 (3+0)
7	ECOLOGY-801	Advances in Plant Ecology	3 (3+0)
8	ENVIRON-708	Special Topic in Environment Science	3 (3+0)
9	ENVIRON-803	Agrochemicals in the Environment	3 (3+0)
10	ENVIRON-808	Remediation Strategies for Contaminated Environment	3 (3+0)
11	TOXICOL-801	Environmental Toxicology	3 (3+0)
12	ENVIRON-705	Cleaner Production Technologies	3 (3+0)
13	ENVIRON-707	Population Dynamics and Environment	3 (3+0)
14	ENVIRON-709	Sustainable Agriculture	3 (3+0)

List of Elective Courses for PhD Environmental Science

Sr.No.	Course Code	CourseTitle	Credit Hours
15	ECON-801	Green Economy	3 (3+0)
16	ENVIRON-704	Alternative Energy Sources	3 (3+0)
17	ENVIRON-804	Carbon sequestration and Environment	3 (3+0)
18	ENVIRON-806	Global Environmental Politics	3 (3+0)
19	ENVIRON-807	Quality Assurance and Quality Control	3 (3+0)
20	ENVIRON-841	Project Development and Management	3 (3+0)
21	EPIDEMO-801	Advance Epidemiology	3 (3+0)
22	MICRBIOL-802	Applied Environmental Microbiology	3 (3+0)
23	ENVIRON-741	Coastal Environment and Management	3 (3+0)

RESEARCH AND LABORATORIES

Research and Laboratories (Environmental Science)

Environmental Science Lab

In the Environmental Science Laboratory most of the environmental sciences experiments are ready to carry out general experiments. The students normally perform various experiments related to environmental studies, such as air, water and others analysis as the given courses' requirement. Moreover, the students of BS and MS Environmental Science perform their research work under the assigned supervisors. Furthermore, health and safety procedures are followed accordance to the guidance of lab supervisor and research project supervisors.

1. **Conductivity meter**
2. **Flame photometer**
3. **NPK soil kit (Hanna)**
4. **Lux meter**
5. **Hygrometer**
6. **Noise level meter**
7. **Analytical balance**
8. **Magnetic stirrer**
9. **Compass Global Positioning System (GPS)**
10. **Calorimeter**
11. **Blood group test kit**
12. **Biological species**
13. **Chemicals and glassware's**

Projects

The following funded projects are being executed by the faculty members of department of environmental sciences to support BS and MS students.

1. GCF-HEC titled "Enhancement of global competitiveness of Pakistan Textile export value-chains bycapacity building and product diversification (KnowTex)" Work Package - 2 "Value Added Textiles from Pakistani Wool" PKR 14.62 million.
2. Role in work Package II: Environmental Impact Assessment of Wool Washing /chemical treatments for its optimization.
3. Grass root ICT Research Initiative (NIGIRI) 2021-2022. Title Investigation of EMF-RF radiation impacts on employee's health in higher education institution worth 80K
4. Seed Grant, 1st runner up: Environmental Health and Safety Solutions (EHS) solution.
5. Evaluation of groundwater system and explore recharge zone of depleting aquifer at Quetta valley.
6. Sustainable solid waste segregation and management strategy for BUITEMS: A step towards clean green campus.
7. An integrated modelling approach used to estimate the impact of climate change and human induced pressure on stressed ground water resources of Quetta sub-basin, Balochistan.
8. To install rainwater harvesting plant at BUITEMS Quetta.
9. Treated Masijid's ablution water and reuse for irrigation at BUITEMS, Taktattu campus Quetta.
10. Analysis water quality, anthropogenic and metrological factors to manage groundwater resources at Quetta: using remote sensing and GIS technologies.
11. Evaluating spatiotemporal changes of urban expansion and its environmental impacts in Quetta valley: Using GIS and remote sensing.
12. Monitoring and modeling temporal impacts of urbanization on local water resources of Quetta valley.

ENVIRONMENTAL MANAGEMENT & POLICY (EMP)

Environmental Science Lab

The programs (MS & PhD) at the Department of Environmental Management & Policy (EMP) aim to equip the students with tools and concepts needed to understand multitude of environmental challenges such as maintaining air quality, protecting water resources, solid waste management, meeting an increasing demand for energy, understanding of natural systems, assessing the impact of human behavior on nature enabling to take decisions relating to specific environmental situations.

Objectives

1. To provide insight into the causes, nature and consequences of pollution and deterioration of natural environment (soil, water and air); and their effect on living organisms
2. To develop an in-depth understanding on the cross-cutting interrelated, interconnected and interdependent nature of environmental issues.
3. To improve the quality of students' vision with the support of scientific procedures
4. To provide students with an opportunity to apply and enhance their knowledge and skills acquired in the study of particular environmental problems and related issues through case studies and practical assignments.
5. To enhance students' ability to identify possible mitigation strategies, decision-making skills to device implementation policies for sustainable environmental management

Scope of the Programs Offered

Today's global issue is environmental pollution. Most of the governments, donors and International Non-Governmental Organizations have chalked out strategic plans under the assistance of leading organizations such as United Nations' Environment Program (UNEP), United Nations' Development Program (UNDP), the World Conservation Union (IUCN), United States Environmental Protection Agency (USEPA), etc. to cope up with the already degrading state of environment. Future Environmental Managers/Specialists from BUITEMS would find unique and wide range of opportunities for employment in both public and private sectors covering planning, implementation, monitoring, academic and research activities.

Degree Plan

Minimum duration of MS. is 2 years (after 16 years of education). The students are expected to complete the 24 Credit Hours coursework related to their concerned area followed by MS. research and dissertation measuring up to International standards.

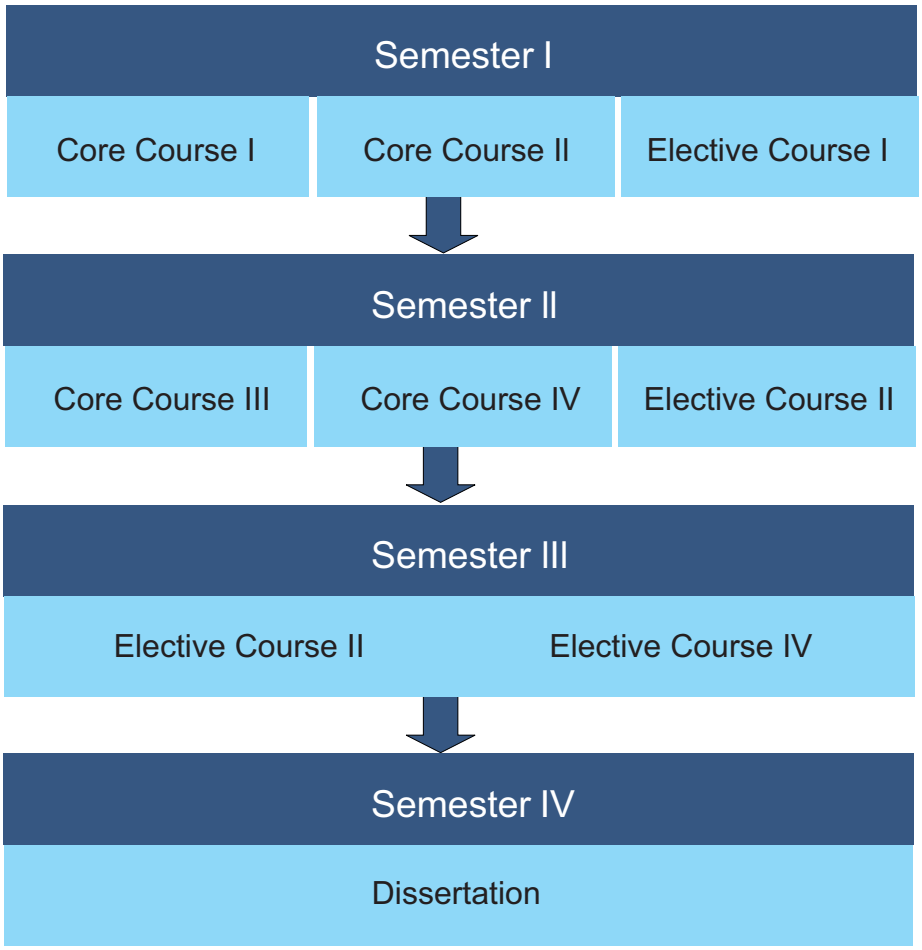
Pre-Requisite

The candidates must have 16 years of education in Natural, Applied or Social Sciences from a HEC recognized institution with minimum CGPA 2.0 out of 4.0 or at least 50% marks (annual system). Candidates having substantial work experience covering environmental issues would be preferred.

Admission shall be made on the basis of Entry test that will be conducted by NTS, GAT general with at least 50% marks, BUITEMS interview and academic record.

Degree Plan MS EMP

The following degree plan includes core courses I, II, and elective courses with thesis.



Scheme of Study for Master of Science (MS) in Environmental Management & Policy

MS (EMP) is two year degree program of 24 credit hours of coursework (12 Credit Hours core courses and 12 Credit Hours of optional/elective courses) to be chosen from the below mentioned courses and 6 credit hours of thesis/research work spread over four semesters. Each semester consists of 16-18 weeks. The core courses will be as below:

1)	**ENVIRON-501**	**(Principles of Environmental Science)**
2)	**ENVIRON-502**	**(Water Supply and Sanitation)**
3)	**RES-503**	**(Research Methods and Techniques)**
4)	ENVIRON-601	(Disaster Management)

Optional/Elective Courses Offering

To offer an optional course, minimum of three (3) students must be registered in that particular course.

Scheme of Study for PhD in Environmental Management & Policy

PhD (EMP) is of minimum three years degree program. Students are expected to complete coursework relevant to their concerned area of PhD research and dissertation of International Standard. The required coursework for PhD students is 18 credit hours with a 12 credit hour dissertation.

List of courses with course codes up to 600 level

S.NO.	Course code	Course title	Credit hours
1	ENVIRON-501	Principles of environmental sciences	3+0
2	ENVIRON-502	Water supply and sanitation	3+0
3	RES-503	Research methods and techniques	3+0
4	ENVIRON-601	Disaster management	3+0
5	IT-601	Geographic information systems (Gis)	3+0
6	ENVIRON-505	Environmental management systems	3+0
7	ENVIRON-602	Urban environmental management	3+0
8	MGMT-602	Project management	3+0
9	ENVIRON-604	Solid waste management	3+0
10	ENVIRON-605	Energy and environment	3+0
11	ECON-605	Environmental economics	3+0
12	ENVIRON-607	Environmental impact assessment (Eia) procedures	3+0
13	ENVIRON-608	Environmental geology	3+0
14	ENVIRON-611	Wastewater management	3+0
15	ENVIRON-613	Natural resource conservation	3+0
16	ENVIRON-616	Statistical inference	3+0
17	ENVIRON-617	Natural hazards	3+0
18	ENVIRON-618	Environmental law	3+0
19	ENVIRON-619	Sustainable urban planning	3+0
20	ENVIRON-620	Environmental politics & policy	3+0
21	ENVIRON-621	Ecotourism management and policy	3+0
22	THESIS-603	Research thesis	6+0

List of courses with course codes containing 700 level

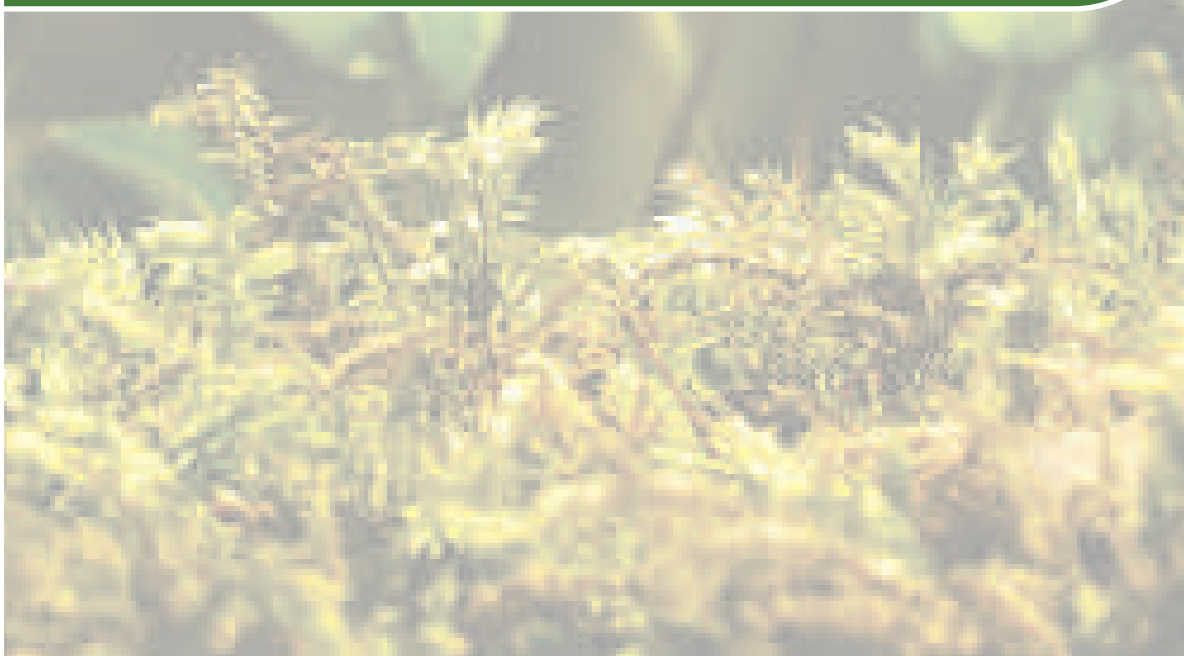
S.NO	Course code	Course title	Credit hours
1	ENVIRON-701	Environmental health	3+0
2	ENVIRON-703	Integrated water resources management	3+0
3	ENVIRON-704	Environmental and occupational epidemiology	3+0
4	ENVIRON-710	Air quality management	3+0
5	ENVIRON-711	Groundwater management	3+0
6	ENVIRON-712	Solid waste management	3+0
7	ENVIRON-808	Ecotourism management and policy	3+0
8	ENVIRON-809	Energy and environment	3+0
9	DISS-701	Research & dissertation	12+0

EMP PhD. program

Minimum duration of Ph.D. is 3 years (after 18 years of education). The students are expected to complete the 18 Credit Hours coursework related to their concerned area followed by PhD research and dissertation measuring up to International standards.

FACULTY PROFILE

Department of Environmental Science



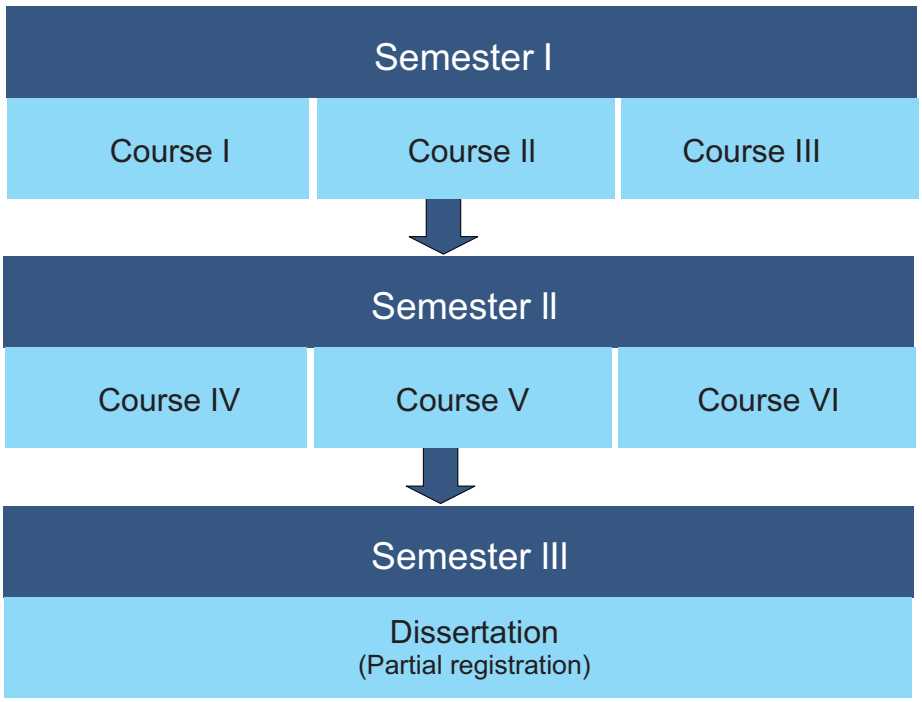
Pre-Requisite

The candidates must have an MS (EMP) degree or 18 years of education in Natural or Social Sciences from a HEC recognized institution with minimum CGPA of 3 or having 1st class division. Candidates having substantial work experience covering environmental issues would be preferred.

Admission shall be made on the basis of BUITEMS entry test, interview /GAT subjective or GRE Subject with at least 60% marks and academic record.

Degree Plan PhD.

The following degree plan includes core courses I, II, and elective courses with thesis.



FACULTY PROFILE (Environmental Science)

Dr. Gohram Malghani
Associate Professor / Chairperson

Dr. Gohram Malghani is working as a chairperson in the department of Environmental Sciences, Faculty of life sciences and informatics BUITEMS Balochistan. Dr. Malghani did is MS in Environmental Management, PhD in Urban and Regional Planning, (Built Environment). Dr. Malghani has more than twenty years of teaching and research experience at university level. Dr. Malghani in his academic career supervised many research project students, his research interest includes water resource management including flood management, environmental policy, Environment Impact Analysis, Urban planning, Climate change, environmental law and air pollution

Dr. Anila Ali
Professor

I joined BUITEMS in 2005 as Research Associate. Later, did MS in Environmental Management and Policy (2013) and Ph.D in Environmental Health and Policy (2018) and serving as Professor in the Department of Environmental Sciences. I have supervised number of MS research students, in areas as: Electromagnetic radiation, air pollution, noise pollution, energy solution, carbon footprint and climate change. Currently, I am engaged in teaching, supervising, counselling of students and also engaged as co-PI in a GCF research project "KnowTex" and HEC project " Green Youth Movement". Teaching experience includes: solid waste management, Public Health and Environmental, Environmental Education, Environmental Sciences and various domains in Psychology. Field of research specialization is noise impacts on physiological and psychological health of the exposed population.

Dr. Malik Muhammad Akhtar
Associate Professor

Dr. Malik Muhammad Akhtar did his PhD in 2013 from China University of Geosciences, Wuhan, China and two years PostDoc in Hydrology and Water Resources Management. Dr. Malik research interests include GIS and Remote Sensing applications in Hydrology and Environmental Science, surface water and groundwater modelling and climate change and its impacts. He has about 15 years of professional experience including research, teaching and administration (Chairperson, Department Environmental Science, BUITEMS) in national and international universities. He has published over 36 research articles in Impact factors in national and international (HEC recognized) journals. He is nominated as Expert in Balochistan Water Task Force. At BUITEMS, he is member of different committees at BUITEMS. He is member of national and international universities/orginizations, Selection Board, Board of Studies and Research advisor. He is editor/reviewer/member of editorial board of international Journals. He has participated in three international projects funded by Geological Survey of China and ACIAR, Australia and completed 9 national research projects as PI and CO-PI funded by NRPU-HEC, ORIC-HEC, ICRMS-BUITEMS and NCPC. He is PhD approved supervisor from HEC, Pakistan.

Dr. Faiza Akhtar
Associate Professor

Field of Specialization: Permaculture Approach, Nature Based Solutions, Strategic Management, Sustainable Forest Management, WEEE Management, Activity Modeling, Social Learning.

Projects: Lahore Knowledge Park (LKP) as Expert Environmentalist of Care Team Lahore Knowledge Park is a Project of Lahore Knowledge Park Company, owned by Higher Education Department of Government of the Punjab. Project Worth = Rs. 131 billion (on going).

Assessment of Environmental Lead Pollution on Blood Lead Levels in street vendors in Quetta District, Pakistan as Principal Investigator to Office of Research Innovation and Commercialization (ORIC BUITEMS) working under Pakistan Higher Education Commission HEC) (Completed).
Analyses water quality, anthropogenic and metrological factors to manage groundwater resources at Quetta: Using Remote Sensing and GIS techniques as Co-Principal Investigator to Office of Research Innovation and Commercialization (ORIC BUITEMS) working under Pakistan Higher Education Commission (HEC) (Completed).
Estimation of Domestic Electric Electronic equipment's waste in Balochistan Pakistan as Principal Investigator to Office of Research Innovation and Commercialization (ORIC BUITEMS) working under Pakistan Higher Education Commission (HEC) Ref. No. No. 01/ Research Projects/ ORIC/ BUITEMS/ 2011/324 Dated: 04-12-2018(Completed).

Dr. Faheem Nawaz
Associate Professor

Serving as an Associate Professor in the Department of Environmental Science, Faculty of Life Sciences & Informatics at Balochistan University of Information Technology, Engineering and Management Sciences. As far as his academic background is concerned, he acquired CAS Scholarship for pursuing Ph.D. in 2012-13. In July 2016, he has received Ph.D. degree in Environmental Engineering from the reputable university as reported in Nature Index, University of Chinese Academy of Sciences (UCAS), Beijing, China. During his Ph.D. tenure, he was declared as an Excellent International Student for publishing various peer-reviewed research articles in renowned journal. Furthermore, he has completed M.Sc. chemistry in 2006 from Hazara University. Considering professional experience, Dr. Nawaz worked as a Scientific Officer from 2007 to 2012 in Pakistan Council of Research in Water Resources (PCRWR), Ministry of Science & Technology Islamabad. His job was predominantly revolving around the assessment of drinking water quality parameters. Water and wastewater treatment technologies particularly Advance Oxidation Process, drinking water quality parameters and the determination of residual pesticides, especially Persistent Organic Pollutants (POPs)/OCPs in surface water bodies recording and evaluating site data, and comprehensive field reports. Specialize at assessing and enhancing the quality of water supply system.

Dr. Javid Hussain (on study leave)
Assistant Professor

I have joined the Department of Environmental Sciences, BUITEMS as Assistant Professor on 1st March, 2018 and serving till now. I also worked as Assistant Professor from August 2017 to February, 2018 in the Department of Environmental Sciences, International Islamic University Islamabad. I completed my PhD in Environmental Science in December 2016 from Hohai University, China. I was awarded a Gold Medal on getting 1st position in Master of Environmental Sciences from FUUAST, Karachi. My research area of interest is occurrence, spatial and temporal distribution, risk analysis source identification and treatment of heavy metals and organic pollutants such as PAHs, PCB and pesticides etc. in different environments media.

Dr.Jawad Ali
Assistant Professor

Dr. Jawad Ali, working as an Assistant Professor in the Department of Environmental Science, Faculty of Life Sciences & Informatics since May 2018. He has done his Ph.D in Environmental Science from University of Peshawar in 2017, MS from International Islamic University Islamabad (IIUI) in 2009 and MSc in Chemistry from Gomal University D.I.Khan in 2006. During his Ph.D he worked on Heavy Metals and Physico-chemical characteristics of Kurram River (Pakistan) Water and its effects on Agricultural land, Maize and Wheat crops, and MS Dissertation was related to Fresh Water Quality from Source to End User in Distt. Muzaffarabad.He has a field and practical working experience in Oil and Gas Development Company Limited (OGDCL) as Health Safety Environment Quality (HSEQ) Professional for 5 years, in Environmental Protection Agency (EPA KPK) in Initial Environmental Examination / Environmental Impact Assessment (IEE/EIA) for 2 years, also worked with Xinjiang Bexin Road and Bridge Construction Company as Environment Specialist. He has a research publication in water quality characteristics affected by Heavy metals and physico-chemical parameters. His research area is Water quality, Heavy metals, HSE, EIA, IEE, Solid Waste Management, and Ecotourism.

Dr. Maqsood Ahmad
Assistant Professor

Ph.D. Environmental Science in Department of Environmental Science Faculty of Life Sciences and Informatics. Expertise/Research Area Are Environmental Microbiology, Bioremediation, Pharmacognosy, Environmental Monitoring & Climate Change.

Ms. Nadia Iqbal
Lecturer

Nadia Iqbal did her BSc (hons) in Environmental Sciences from University of the Punjab and MS in Environmental Sciences from the same University. During MS, she worked on occupational health injuries, health and safety related issues of small and medium scale surgical industries. During the study, she also worked on field projects of disaster management, EIA, IEE and occupational health and safety. She participated in different trainings and workshops on solid waste disposal and waste water treatment.

Ms. Abida Dost Muhammad
Lecturer

Abida Dost Muhammad did her Bachelor's degree in Chemistry from Sardar Bahadur Khan Women University in 2011. She did her MS in Environmental Management & Policy (Gold Medal) from BUITEMS in 2015. Her MS research was based on physical and chemical Assessments of Groundwater. During Her study, she worked on the impact of Climate change on Agriculture & Water Resources, Heavy Metals contamination in Drinking water & Environmental Sustainability. The core research areas of her interests are Climate change adaptation and Mitigation, Groundwater Modelling, and Sustainable Development.

Mr. Taimoor Shah Durrani
Lecturer

I am currently working as Lecturer from past 5 years in the Department of Environmental Science, Faculty of Life Sciences as well as doing my PhD from the Environmental Management and Policy Department Buitems. I have done my Masters and MPhil from Quaid e Azam University, Islamabad in 2014 and 2017. My research interest focuses generally on monitoring various environmental compartments especially groundwater and their related health impacts.

Mr. Habib Ullah
Lecturer

I have completed my MS in Natural Resources with emphasis on Soil Science from the School of Natural Resources, Department of Soil, Environment and Atmospheric Sciences, University of Missouri Columbia, United States of America, under the flagship project of Agriculture Innovation Program for Pakistan (AIP-Pakistan) sponsored by USAID. Prior to it, I had completed my BS in agriculture majoring in Soil Science from Sindh Agriculture University Tandojam, Pakistan. During my undergraduate studies, I had the privilege to visit United States of America as a cultural ambassador of Pakistan for one full-time academic semester.

I have worked as research consultant for Agronomy and Soil Science in Islamabad with CIMMYT Pakistan, and as sales and marketing officer with FMC Pakistan.

I have been part of BUITEMS since September 2019. Here, I have taught a diverse range of academic courses and supervised research students for their final research projects. Before joining BUITEMS, I taught different courses at the Department of Environmental Science and Department of Disaster Management, University of Balochistan, Quetta.Previously I have published my research in high impact factor international research journals and my research interests include study of biogeochemical cycles, soil pollutants, soil flora and fauna, forest soils, wetland management, nutrient management in agriculture ecosystems, soil fertility, soil conservation, land degradation, carbon sequestration, soil organic matter, land range management, arid zone land management, natural resource management, climate change, global warming, land use -and land cover patterns, and agricultural and environmental policy development.

Ms. Samia Saleem
Lab Supervisor

Ms. Samia Saleem is working as a lab Engineer in the department of environmental, faculty of life sciences & informatics since September, 2019. She has completed her master's degree (MS) from BUITEMS in 2017. During her MS research she worked in developing the genetic barcodes of various local wheat in Balochistan. Besides, during her bachelor's research degree program, she worked to assess the water quality of various filter water plants suited within the city area and gave productive comparative analysis.
Moreover, formerly she joined Alhamd Islamic University as a lecturer in 2014 and worked as a focal person at Balochistan Institute of Technology in 2015. Her role in establishing and managing department of Allied Medical Sciences as an Assistant director at AIU Quetta campus is highly admirable.

Faculty on study leave (Environmental Science)

Dr. Javid Hussain
Assistant Professor

Mr. Amir Mehmood
Assistant Professor

Ms. Sobia Faisal
Assistant Professor

Ms. Maria Khalid
Lab Supervisor

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