

### DEPARTMENT OF BIOTECHNOLOGY

#### OVERVIEW

Biotechnology refers to various techniques and technologies used in the bio-industrial production or bio-genetic controlled processes involving vegetal, animal or human organisms. Genetic manipulation is the most common form of using living organisms and biomolecular processes for the creation or modification of the physical properties of various types of products. Example of biotech products or practices include antibiotics, biofuels and genetically modified foods. An important medical application of biotechnology includes genetic processes that lead to organ regeneration.

Biotechnology contributes to developments in areas like agriculture, food production and security, climate control and medicine. Biotechnology can also help with solving some of the most pressing environmental issues, like oil spills, pesticide side effects or polluted water, contributing to the health of the natural environment.

The Department was established in 2010 with an objective of imparting quality education in the multidisciplinary field of Biotechnology at both undergraduate and postgraduate levels. The Department provides a platform for its consortium members and alumni to contribute to the growth of this futuristic technology. In conclusion, with highly competent industry-oriented academics engaged in the interdisciplinary growth of the technology, the department strives in imparting quality technical education and research in advanced and emerging areas of Industrial, Medical, pharmaceutical and food applications of Biotechnology.

Masters in Biotechnology include blended curricula with a mixture of lectures in biology, medicine, bioinformatics combined with laboratory work, computer applications and research and even ethical case studies. Biotechnology degrees provide solid grounding in biochemistry, molecular biology, genomic, bioinformatics, nanotechnology or innovation management, as well as in-depth IT skills.

Biotechnology graduates develop careers in a wide range of fields such as the chemical, pharmaceutical, food and environmental industries, in genetics and regenerative medicine, in process control, or in research and development. Example roles include bio-informatician, biophysicist, quality control analyst, biomedical engineer, pharmaceutical sales representative, or crime lab technician.

#### LEARNING OBJECTIVES

The department goal is to equip students with the necessary skills and education to compete for the best in the 21st century. Also to inspire our students to be future leaders of our country toward a more prosperous and a more developed Pakistan.

#### OUTCOMES

The program aims to build the student from a scientific point of view, in line with modern scientific techniques of molecular biology. It also aims to qualify the students scientifically so they can work efficiently in the field of scientific and industrial teaching and research.

## **FACULTY OF SCIENCE & TECHNOLOGY**

Our graduates are expected to be capable of working at the following job positions:

- Scientific Research - Research Centers
- Ministry of Health (Molecular Biology Laboratory)
- Universities and Colleges
- Ministry of Agriculture
- Ministry of Education - teachers
- Hydrology Groups
- Private schools
- Private sector that includes laboratories
- Ministry of Justice (forensic laboratories)
- Food factories.

### **DEGREE PROGRAMS OFFERED**

- BS Biotechnology
- BS Biotechnology (Self Support evening program)
- MS Biotechnology
- MS Biotechnology (Self Support evening program)
- Ph.D. Biotechnology

### **BS BIOTECHNOLOGY ELIGIBILITY CRITERIA**

- F.Sc Pre-medical, A levels or equivalent.
- All other requirements are as per university admission policy (Please see University eligibility criteria for BS admission)

### **MS PROGRAM ELIGIBILITY CRITERIA**

- 16 years of education i.e. BS/M.Sc. in Biotechnology, Botany, Biochemistry, Zoology, Environmental sciences, Agricultural sciences and Pharmacy,
- Homeopathic medicine, Medical Lab Technology or equivalent.
- All other requirements are as per university admission policy (Please see university Eligibility Criteria for MS admission)

### **SPECIALIZATION OFFERED**

Plant Biotechnology  
Plant Genomics  
Algal Biotechnology  
Genetic Manipulation and Protein Engineering  
Industrial Microbiology  
Industrial Biotechnology  
Industrial and Clinical Microbiology  
Health Biotechnology  
Human Genetics

### **PH.D. PROGRAM**

#### **ELIGIBILITY CRITERIA**

- 18 years of education i.e. MS/ M.Phil. in Biotechnology, Botany, Biochemistry, Zoology, Environmental Sciences, Agricultural Sciences, Pharmacy, Homeopathic Medicine, Medical Lab Technology or equivalent.
- All other requirements are as per university admission policy (Please see university eligibility criteria for Ph.D. admission)



## FACULTY OF SCIENCE & TECHNOLOGY

### SPECIALIZATION OFFERED

- Plant Biotechnology
- Plant Genomics
- Algal Biotechnology
- Genetic Manipulation and Protein Engineering
- Industrial Microbiology
- Industrial Biotechnology
- Industrial and Clinical Microbiology
- Health Biotechnology
- Human Genetics
- Nanobiotechnology

### LIST OF FACULTY

**Prof. Dr. Shagufta Naz** COD M.Sc. Botany (PU), Ph.D. Botany with Specialization in Plant Biotechnology (PU), Postdoc, Plant Genomics (UC-Davis, USA)

**Dr. Faiza Saleem**, Tenured Associate Professor (TTS) M.Sc. Zoology (PU), Ph.D. Biological Sciences with Specialization in Micro- and Molecular Biology (PU), Postdoc Molecular Biology (PU),

**Dr. Mehwish Iqtedar**, Tenured Associate Professor (TTS) M.Sc. Zoology (PU), Ph.D. Zoology with Specialization in Microbiology (PU)

**Dr. Neelma Munir**, (Assistant Professor (TTS) M.Sc. Botany (PU), Ph.D. Botany with Specialization in Plant Biotechnology

**Dr. Roheena Abdullah**, Assistant Professor (TTS) M.Sc. Botany (PU), M.Ed., M.Phil. (GCU), Ph.D. Botany with Specialization in Industrial Biotechnology (GCU),

**Dr. Rasheeda Bashir**, Assistant Professor (TTS) M.Sc. Zoology (GCU), M.Phil. Zoology (GCU), Ph.D. Microbiology and Molecular Genetics (PU)

**Dr. Farheen Aslam**, Assistant Professor (TTS) M.Sc. Biochemistry (PU), Ph.D. Biological Sciences with Specialization in Biochemistry and Molecular Biology (PU)

**Dr. Afshan Kaleem**, Assistant Professor (TTS) MS Biochemical Engineering (Denmark), Ph.D. Biotechnology (GCU) with Specialization in Proteomics and Bioinformatics

**Dr. Saiqa Ilyas**, Assistant Professor (Adhoc) M.Sc. Botany (GCU), M.Phil. Biotechnology (GCU), Ph.D. Botany with Specialization in Plant Biotechnology (LCWU), Assistant Professor

**Dr. Rukhama Haq** BS (Hons.) Botany (LCWU), MS Botany (LCWU), Ph.D. Biotechnology (LCWU)

**Dr. Mahwish Aftab**, Assistant Professor (Adhoc) BS (Hons) Zoology (PU) (Gold Medalist), M.Phil. Molecular Biology (CEMB, PU) (Gold Medalist), Ph.D. Biotechnology (LCWU)

**Dr. Bushra Khubaib**, Lecturer (PPSC) M.Sc. Biochemistry (PU), M.Phil. Molecular Biology (CEMB, PU) (Silver Medalist) Ph.D. Molecular Biology (CEMB, PU)

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## FACULTY OF SCIENCE & TECHNOLOGY

### DEPARTMENT OF BOTANY

#### OVERVIEW

Botany as an essential part of FSC is being taught since 1922 at LCWU. B.Sc. Botany classes started in 1956 and M.Sc. Botany was launched in 1994 by the endless efforts of Mrs. Khatoon Zahoor. A four year BS degree program was initiated in 2005, whereas M.S, M.S leading to Ph.D and Ph.D programs were started in 2009 at the Department of Botany.

Mrs. Dilara Muqueet, Ms. Prem Madan, Prof. Mrs. Khatoon Zahoor, Mrs. Shamim Sattar, Prof. Mrs. Rashida Zafar and Prof. Mrs. Zafar Hussain served as former HODs from 1956 to 2013. Ms. Prem Madan would always be remembered as a legendary teacher and administrator. Currently Prof. Dr. Farah Khan is the Chairperson of the Botany Department. Our mission and vision is to train the youth to apply the basic knowledge of Plant Sciences to broaden the horizons of Agriculture, Horticulture and Industry including Biotechnology. We are striving to achieve excellence and to produce skilled professional graduates following the requirements of current job market.

#### BS PROGRAM

##### LEARNING OBJECTIVES

- The overarching aim of Botany Department is to produce graduates, post graduates & doctorates with better understanding of plant sciences.
- We are also determined to provide well skilled female graduates of Plant Sciences, according to the requirement of the job market on national and international levels and give a new get up to Botany as a subject, making it more appreciable and attractive for the human resource sector.
- Department of Botany intends to get its students well groomed, creative and confident to step forward in the practical life
- To produce graduates with dynamic and research oriented approach who are able to get incorporated in reputable national and international universities, institutes and companies for further education/research or job.
- To develop and train Human resource in current job oriented fields of Plant Sciences.
- To prepare the skilled and professional Pakistani female youth with high moral values and ethics.

##### DEGREE PROGRAM OFFERED

- BS Botany
- MS Botany
- Phd Botany

##### JOB OPPORTUNITIES

- Teaching at various public and private sector Educational Institutes/Universities.
- Researchers at different scientific national and international research institutes.
- Employment at national and international Agriculture, Horticulture and Biotechnological Institutions/Departments and Companies.

##### ELIGIBILITY CRITERIA FOR BS

- F. Sc. (Pre-Medical) or Equivalent
- **Duration:** 4 Years
- Total Credit Hours: 136



## FACULTY OF SCIENCE & TECHNOLOGY

### MS BOTANY

#### LEARNING OBJECTIVES

- Our aim is to produce post graduate scholars that have better understanding of Plant Sciences and their application in society.
- To develop and train human resource in the field of Plant Sciences, making it job oriented.

#### ELIGIBILITY CRITERIA FOR MS

- BS Botany or Equivalent (16 Years education)
- Kindly visit university website for further information

Duration: 2 Years

Total Credit Hours: 36

### PH.D. BOTANY

#### LEARNING OBJECTIVES

We aim to produce national scholars and researchers, who are not only able to transfer their knowledge to society but can also compete on national and international levels with their innovative and evolutionary research work.

#### OUTCOMES

To generate self- motivated scholars who can compete at international level by making revolutionary development in Plant Sciences.

#### ELIGIBILITY CRITERIA FOR PhD

- MS Botany or Equivalent (18 Years education)
- Total Credit Hours: Course work 18 CRH
- Kindly visit university website for further information

#### LIST OF FACULTY

**Prof. Dr. Farah Khan** (Chair/Professor)-Directorate of Research, M.Sc. Botany, Ph.D Botany with specialization in Biotechnology (PU, Pk.), Post Doc in Molecular Genetics specially the Viroidal Genomics, Ohio State University, (USA).

**Prof. Dr. Zeb Saddiqe** (Professor) M.Sc. Gold Medalist, Botany (PU, Pk.), PhD Botany with specialization in Phytochemistry (LCWU, Pk).

**Dr. Zubaida Yousuf** (Associate Professor) M.Sc. Botany (UAAR, Pk.), Ph.D. with specialization in Molecular Taxonomy (QAU, Pk.), Post Doc. with specialization in medicinal Plants Genomics and Genetics (China).

**Dr. Shabnam Shaheen** (Assistant Professor) M.Sc. Botany (UAAR, Pk.), Ph.D Plant Sciences with specialization in Plant Taxonomy (QAU, Pk.), Post Doc. with specialization in medicinal Plants (Malaysia)

**Dr. Sumera Iqbal** (Assistant Professor) M.Sc. Botany (UAAR, Pk.), Ph.D Plant Sciences with specialization in Plant Physiology (QAU, Pk).

**Dr. Khajista Jabeen** (Assistant Professor) M.Sc Botany, Ph.D Mycology and Plant Pathology with specialization in Fungal Biotechnology (PU, Pk).

**Dr. Sumera Javad** (Assistant Professor) M.Sc Botany Gold Medalist (LCWU, Pk.), Ph. D Botany with specialization in Plant Tissue Culture and Biochemistry (LCWU, Pk).

## FACULTY OF SCIENCE & TECHNOLOGY

**Dr. Smaina Sarwar** (Assistant Professor) M.Sc. Botany, Ph.D Botany with specialization in Molecular Mycology/Fungal Biology (PU, Pk.), PhD IRSIP Fellowship (UK).

**Mrs. Mobina Ulfat** (Assistant Professor) M.Sc. Botany, M.Phil Botany with specialization in Plant Physiology (UAF, Pk).

**Dr. Sobia Ilyas** (Assistant Professor) BS Hons. Botany, Ph.D Botany with specialization in Molecular Mycology, Plant Fungal Interaction, Fungal Biology (PU, Pk.), PhD IRSIP Fellowship (USA).

**Dr. Sana Khalid** (Assistant Professor) M. Sc Hons. Gold medalist (Botany), M. Phil (PU, Pk) Ph.D (PU, Pk) with specialization in Molecular Plant Virology.

**Dr. Kiran Shahzadi** (Assistant Professor, Adhoc) M.Sc. Botany, M.Phil Biotechnology (GCU, Pk.), Ph.D Botany with specialization in Plant Biotechnology (LCWU, Pk).

**Dr. Riffat Siddique** (Assistant Professor, Adhoc) M.Sc. Gold medalist Botany (PU, Pk.) Ph. D Botany with specialization in Molecular Virology (LCWU, Pk).

**Dr. Hannan Mukhtar** (Assistant Professor, Adhoc) M.Sc. Botany (PU, Pk.) Ph. D Botany with specialization in Biotechnology (LCWU, Pk).

**Dr. Amna Tariq** (Assistant Professor, Adhoc) M.Sc. Botany, M.Phil Environmental Sciences (GCU, Pk.) Ph. D. Botany Gold medalist with specialization in Biotechnology (LCWU, Pk).

**Dr. Aroosa Aftab** (Lecturer)

M.Sc. Gold Medalist, Botany (GCU, Pk.), M.Phil Botany with specialization in Ethnobotany (GCU, Pk).

**Dr. Zaryab Khalid Sial** (Lecturer)

MS Botany with specialization in Biotechnology (LCWU, Pk).

### SUPPORTING STAFF

**Mrs. Shaheen Qasim** Lecture Assistant

**Mr. Muhammad Wasim** Junior Clerk

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## FACULTY OF SCIENCE & TECHNOLOGY

### DEPARTMENT OF CHEMISTRY

#### OVERVIEW

Chemistry has been taught at LCWU at intermediate level since 1922, right from the day Lahore College for Women was founded as an intermediate college. Graduate program was started in 1958 while B.Sc Honours (3 years), M.Sc. Chemistry and PhD programs were offered for the first time in 2003. Currently BS (4 years), M.Sc. (2 years), MS (2 years) and Ph.D courses are being offered by the department. A total of 21 faculty members (13 PhD, 7 MS and 1 M.Sc) are serving in the fields of physical, organic, inorganic, analytical and biochemistry. Chemistry department is progressing towards excellence in line with higher education commission of Pakistan's commitment to offer excellent education and contents for research in field of chemistry. Dr. Shahana Ehsan has recently joined as the Head of Chemistry Department. The department endeavors to be a nationally recognized model for educating and preparing students to contribute and compete for ever changing, technology centered modern world. To achieve this vision, the department is committed to provide best educational environment by:

- Frequent interactions between faculty and students
- Independent thought
- Collegial exchange of ideas and high ethical standards
- Use of modern educational technology in lectures and laboratory courses

However, our actual pride is our confident, well educated and competent faculty and female students who are expected to occupy the best position in industry, medical and pharmaceutical fields at both national and international levels.

#### LEARNING OBJECTIVES

The department aims at disseminating a systematic, fundamental and comprehensive knowledge of all fields of chemistry to all levels of students:

- The students can communicate successfully in both written and oral formats.
- They can perform effectively in the workplace and have the ability to work and make effective use of a wide variety of current technologies.
- The student can express the ability to think critically, conceptually and rationally, can gather, interpret and analyze data to give inferences.

#### OUTCOMES

- Reveal first rate laboratory skill and techniques; include use of different analytical instruments.
- Demonstrate satisfactory way of thinking to chase their career objectives and further professional training at national and international level.
- Written and communication skills reflect their scientific concepts and knowledge.
- Students show analytical approach towards life, can organize, analyze the raw data and use scientific methods to get results and cope with different problem solving situations.

#### DEGREE PROGRAMS OFFERED

- BS Chemistry
- MS Chemistry
- PhD Chemistry

## FACULTY OF SCIENCE & TECHNOLOGY

### BS PROGRAM

The BS program is designed for students planning graduate study in chemistry and seeking career as professional chemists.

#### Eligibility CRITERIA

- Intermediate (Pre-Medical / Pre-Engineering) with more than 60% marks.
- A level and equivalent with good grades and premedical subjects.
- All other requirements as per university policy (please see university admission criteria for BS)

**Duration:** 4 years

**Total Credit Hours:** 136

#### GROUPS

- Chem, Botany, Zoology
- Chem, Physics, G. Maths

### MS CHEMISTRY

The master of sciences in chemistry program is designed mainly for individuals with a bachelor's degree in chemistry who wish to advance their careers in the local chemical/pharmaceutical industries, educational institute and various research institutes such as PINSTECH and PCSIR etc.

#### Eligibility CRITERIA

- 16 years of education (B.S or M.Sc in relevant fields) or equivalent.
- The candidates must have obtained 2.5/4.00 CGPA in semester system or 50% marks in annual system.
- All other requirements as per university policy (Please see University admission criteria for MS).

**Duration:** 2 years

**Total Credit Hours:** 36

### PHD PROGRAM

The program leading to the Doctor of Philosophy degree in the chemistry is designed primarily to prepare doctoral-level chemists for industrial as well as academic research careers. The areas of research include organic chemistry, analytical chemistry, biochemistry, bioinorganic chemistry, colloid and surface chemistry, electrochemistry, Inorganic chemistry, phyto chemistry, organometallic chemistry, physical chemistry and polymer chemistry.

#### ELIGIBILITY CRITERIA

- Minimum 18 years of education M.Phil / MS in Chemistry.
- The candidates must have obtained 3.00/4.00 CGPA in semester or 60% marks in annual system.
- Candidates working in Government/semi-government institutions have to submit NOC from concerned organization.
- All other requirements as per university policy (Please see university admission criteria for Ph.D).
- Admissions in PhD program will be carried out twice a year, in spring and in autumn depending on the availability of seats.



## FACULTY OF SCIENCE & TECHNOLOGY

### SPECIALIZATION OFFERED

- Organic Chemistry
- Inorganic Chemistry
- Physical Chemistry
- Bio Chemistry
- Analytical Chemistry

### LIST OF FACULTY

**Dr. Shahana Ehsan** Chairperson Department of Chemistry, Associate Professor, M.Sc (PU) Gold Medalist, Ph.D (LCWU)

**Prof. Mrs. Nustren Abid** Professor, M.Sc (PU)

**Dr. Bushra Naseem** Tenured associate Professor, M.Phil, Ph.D (QAU) post DOC Bristol, UK

**Dr. Saadia Rashid Tariq** Tenured Associate Professor, M.Phil, Ph.D (QAU)

**Dr. Erum Akbar Hussain** Tenured Associate Professor, M.Sc, Ph.D (HEJ research institute of chem. KU)

**Dr. Shahida Shujaat** Tenured Associate Professor, M.Phil (QAU), Ph.D (HEJ research institute of chem. KU) post DOC Univ of Cincinnati, Ohio, USA

**Dr. Yusra Safa** Associate Professor (TTS) (on leave), M.Sc, Ph.D (UAF)

**Dr. Tahira Moeen** Assistant Professor, B.Ed, M.Sc (PU), (Gold Medalist) Ph.D (LCWU)

**Mrs. Umbreen Tahir** Assistant Professor, B.Ed, M.Sc (PU), MS (LCWU)

**Dr. Abida Yasmeen** Assistant Professor (TTS), M.Sc, (UAF), M.Phil, Ph.D (QAU)

**Dr. Sana Ahmad** Assistant Professor (TTS), M.Sc. Hons (PU), Ph.D France

**Dr. Fozia Iram** Assistant Professor (TTS), M.Phil (GCU), PhD (PU)

**Dr. Shahnaz** Assistant Professor (TTS), M.Sc., PhD (HEJ)

**Dr. Rehana Kousar** Assistant Professor (TTS), M. Phil (BZU Multan), PhD (South Korea)

**Dr. Shagufta Nasir** Assistant Professor, M.Phil, PhD (UET, Lahore)

**Ms. Syeda Nazish Arshad** Lecturer, MS (LCWU)

**Ms. Touseef Kazmi** Lecturer, MS (LCWU) (on leave)

**Ms. Mamoona Tehseen** Lecturer, M.Phil (PU)

**Ms. Sana Fayyaz** Lecturer, MS (LCWU)

**Ms. Rabia Babar** Lecturer, MS (PU)

**Ms Farah Sohail** Lecturer, MS (PU)

### LIST OF VISITING FACULTY

**Prof. Dr. Bushra Khan** (FRSC, PHF, MACS), M.Sc, Ph.D(PU)

**Dr. Abdul Sattar** Professor

**Dr. Tariq Mahmud** Professor

**Dr. Umer Farooq** Associate Professor

**Dr. Tajamal Hussain** Associate Professor

**Dr. Asim Raza Basra** Assistant Professor

**Dr. Muhammad Salman** Assistant Professor

**Miss Asma Rashid** Lecturer

**Miss Malka Samra** Lecturer

**Miss Asma Iftikhar** Lecturer

**Miss Hira Akash** Lecturer

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### DEPARTMENT OF ENVIRONMENTAL SCIENCE

#### OVERVIEW

The 21st century promises for both an exciting time and a challenging world to live in. Many of the most complex challenges will be environmental forcing people to divert their attention towards this field. Meeting these challenges will require problem solving abilities based in natural, social and management sciences, and other disciplines. Environmental Science is the application of a combination of scientific disciplines to issues and questions regarding environmental and socio-economic problems. Environmental degradation, energy crisis, water scarcity, food security; mitigation and adaptation to climate change impacts are the major areas of concern in today's world. The economy is moving towards "Green or low Carbon Economy" based on Carbon neutrality and valuation of ecosystem services. Environmental pollution, depletion of resources and disintegration of ecological functions are of global, regional and local concerns. To prevent continued environmental degradation and the decline of human society, interactions between human and the environment have to be in harmony. This is achievable through an integrated, holistic approach encompassing natural, social and management sciences with political support and technological, economic and social interventions. This will require qualified and trained human resource and so is the objective of Environmental Science Department. Environmental science department takes pride in the fact that since its inception, over six hundred students have graduated obtaining their BS, MSc and MS degrees and providing services to various echelons of society which indicates the success of our program and the trust of the stakeholders in this department. Environmental Science department is actively involved in the restoration of indigenous flora with community participation, creating awareness about the role of ecosystems in human health and local community capacity building regarding conservation of indigenous vegetation. Environmental scientists are problem solvers. Careers in Environmental Science are so varied that it is difficult to consider them as one category. There is a vast scope in private or in the government sector for the environments science degree holders. A brief detail of opportunities for Environmental Science as, industries , distilleries, fertilizer plants, mines, refineries, textile mills etc., Social Development, Research and Development, Forest and Wildlife Management, NGOs, Pollution Control Boards, Urban Planning, Water, Resources and Agriculture, Public Institutions and Private Industries and Firms, Colleges and Universities, Ministry of Environment and Forests, hospitals. MSc. Disaster Management will open a broad door of job opportunities in LDA, Rescue 1122, and National Disaster Management Authority. It is a great success of Environmental Science Department that majority of graduates have been successful to get the job right after passing out from the University.

#### LEARNING OBJECTIVES

Environmental Science is a decision support science, which has emerged as a result of convergence of a wide range of disciplines, therefore, its scope is wide as inter and multi-disciplinary field of knowledge. Its ambit is as wide as environment itself.

The aim of undergraduate degree programme in the discipline of Environmental Science is sustainable development and to develop human resource equipped with knowledge to support decisions, skills needed to mitigate impacts of climate change or adapt necessary measures and attitude to contribute in development of sustainable life style in the society and to develop green economy.



## **FACULTY OF SCIENCE & TECHNOLOGY**

### **DEGREE PROGRAMS OFFERED**

- BS Environmental Science
- MS Environmental Science (Morning/Self-Supporting Evening Program)
- Ph.D. Environmental Science

### **BS ENVIRONMENTAL SCIENCE 4 YEARS DEGREE PROGRAM**

#### **ELIGIBILITY CRITERIA FOR BS-ENVIRONMENTAL SCIENCE**

- The eligibility for admission is F.Sc. Pre-Medical or Pre-Engineering with 60% marks or A-level with equivalent marks.
- All other requirements as per university policy (please see university admission criteria for BS).

### **MS ENVIRONMENTAL SCIENCE [2 YEARS DEGREE PROGRAM]**

#### **ELIGIBILITY CRITERIA FOR MS ENVIRONMENTAL SCIENCE**

- All the applicants with minimum 16 years of educations (BS/M.Sc./Equivalent) in the subject of Environmental Science/ Botany/ Chemistry/Zoology/Physics/ Agriculture/MBBS/Pharmacy/Geography are eligible.
- All other requirements as per university policy (available on website)

### **PH.D. ENVIRONMENTAL SCIENCE**

#### **ELIGIBILITY CRITERIA FOR PH.D.**

- All the applicants with minimum 18 years of education (M.Phil./MS/Equivalent) in the subject of Environmental Science/ Botany/Zoology/Chemistry/Physics/ Agriculture/MBBS/Pharmacy/Geography/ Wild life and Fisheries are eligible.
- All other requirements as per university policy (available on website)

### **SPECIALIZATIONS OFFERED**

- Sustainable Water Resource Management
- Biodiversity
- Climate Change
- Environmental Biotechnology
- Environmental Monitoring
- Environmental Green Chemistry
- Environmental Toxicology
- Environmental Nanotechnology
- Solid waste management
- Alternate Energy Resources
- Bio-fuel Techniques
- Applied Microbiology
- Environment and Health
- Occupational Health & Safety
- Conservation
- Environmental Plant Pathology
- Phytochemistry
- Soil and Environment

## FACULTY OF SCIENCE & TECHNOLOGY

### LIST OF FACULTY

**Prof. Dr. Tahira Aziz Mughal**, (Chairperson) Ph.D. Chemistry (LCWU) Postdoc (PU). Area of Specialization: Environmental Management, Climate Change, Phytochemistry.

**Prof. Dr. Arifa Tahir**, (TTS), Ph.D. Botany (PU). Area of Specialization: Environmental Microbiology, Climate Change/Conservation, Water Treatment Technologies.

**Dr. Nadia Ghani**, (TTS) Associate Professor, Ph.D. Zoology (PU). Area of Specialization: Environmental Toxicology

**Dr. Numrah Nisar**, (TTS) Associate Professor, Ph.D. (Cell and Molecular Biology, UK).

Area of Specialization: Environmental Monitoring, Environmental Biotechnology.

**Dr. Sofia Nosheen**, Assistant Professor, Ph.D. Environmental Chemistry (UAF).

Area of Specialization: Environmental Chemistry, Sustainable, Green Chemistry.

**Dr. Ammara Fatima**, (TTS) Assistant Professor, Ph.D., Plant Nutrition (JLU, Germany).

Area of Specialization: Environmental Biotechnology, Environmental Stress Physiology.

**Dr. Moneeza Abbas**, Assistant Professor Ph.D. Zoology (LCWU). Area of Specialization: Environment and Health, Environmental Pollution and Management

**Dr. Amina Zafar**, Assistant Professor, Ph.D. Environmental Science (LCWU) (Bronze Medalist LCWU). Area of Specialization: Environmental Monitoring, Environmental Impact Assessment, Environmental Health.

**Dr. Hina Chaudhry**, Lecturer, Ph.D. Environmental Science (LCWU). (Gold Medalist LCWU),

Area of Specialization: Environmental Monitoring, Occupational Health, Climate Change, Conservation.

**Mrs. Zaira Ahmad**, Lecturer, (Silver Medalist LCWU), Ph.D. (in progress PU). Area of Specialization: Conservation Biology, Sustainable Development

**Mrs. Zahra Asghar**, Lecturer, (Bronze Medalist LCWU), Ph.D. (in progress LCWU). Area of Specialization: Environmental Monitoring, Environment and Health

**Mrs. Saima Atif**, Lecturer, Ph.D. (in progress LCWU).

Area of Specialization: Environmental Monitoring.

**Ms. Fakhra Aslam**, Lecturer, (LCWU), Ph.D. (in progress LCWU).

Area of Specialization: Solid Wastes Management, Environmental Monitoring.

**Ms. Rabia Shehzadi**, Lecturer, Ph.D. (in progress LCWU).

Area of Specialization: Waste Water Treatment, Disaster Risk Assessment.

#### Contact Details:

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## **FACULTY OF SCIENCE & TECHNOLOGY**

### **DEPARTMENT OF GEOGRAPHY**

#### **OVERVIEW**

The Department of Geography has the honor to be one of the oldest departments of Lahore College for Women University, Lahore. Right from the beginning, Geography department has been producing knowledgeable students at intermediate and graduate levels. The Department owes a great deal of gratitude to the eminent teachers and professors like Mrs. Bilquis Qureshi, Dr. Maryam Khan, Ms. Ruqia Rafique, Mrs. Akram, Mrs. Saeeda Karamat, Mrs. Sadiqa Nasir and Mrs. Bushra Sharif who contributed towards the progress and betterment of department and worked as the Head of the department respectively. The department launched BS (4-Year) Degree Program in 2011. Presently, Ms. Sahar Zia is working devotedly as the Incharge of the Department. As a step towards academic development, department aims to start MS

#### **LEARNING OBJECTIVES**

- To create understanding of Physical and cultural environment
- To develop skills for analytical study of man-environment interaction
- To develop skills in map reading and cartography
- To introduce simple quantitative methods in geography
- To enhance understanding of physical and cultural milieu of Pakistan and its provinces
- To create understanding of GIS and Remote Sensing, among the students
- To enable students to carry out research projects independently, including data collection, data processing and data presentation in a report, thesis, ACP (Active citizenship Program)
- To enhance communication and presentation skills

#### **OUTCOME**

Students shall be able to:

- Have understanding of Geography as a subject so that they become professionals and have the capability to adapt to any challenge that may offer within their careers
- Work in environmental based organizations e.g. EPA, that deal with the results of man-environment interaction and methodologies to combat them
- Become efficient map interpreters
- Apply quantitative techniques in geography and be able to draw conclusions
- To understand Pakistan's geographical landscape and economic conditions, and serve in institutions like, Statistical Bureau, Dept. of Demography etc.
- Understand the conceptual framework of spatial and attribute data models, and perform complex analysis and presenting the results using Arc GIS and other advanced software
- Achieve educational standards, precisely writing and presentation skills

#### **DEGREE PROGRAM OFFERED**

- BS Program

#### **ELIGIBILITY CRITERIA**

- F.A, FSc, I.Com or Equivalents are eligible to apply for BS Geography. With at least 60% Marks
- All other requirements as per university admission policy (please see university eligibility criteria for BS admission).

## FACULTY OF SCIENCE & TECHNOLOGY

### LIST OF FACULTY

**Ms. Sahar Zia** BS Geography (P. U), M.Phil. Geography (P.U) Lecturer  
Incharge Geography Department

**Mrs. Aysha Faisal** (On study leave) M.Sc. (P.U), M.Phil. (CSAS) P.U, Diploma (GIS)  
PIMS, Assistant Professor

**Ms. Nausheen Mazhar** (On study leave) M.Sc. (P.U), M.A (Eng. Lit.) P.U, PGD (GIS)  
PIMS M. Phil (GCUL) Lecturer

**Ms. Rehana Mehar Ali** BS (Hons) Geography (GCU) M.S. Geography (GCUL)  
Lecturer

**Ms. Amna Afzal** M.Sc. (P. U) M.S.. Geography (GCUL) Lecturer

### List of Visiting Faculty

**Ms. Rubab Zafar** M.Sc Geography ((P. U), M.Phil. Geography ((P.U) Visiting  
Lecturer

**Ms. Iqra Ashraf** M.Sc Geography ((P.U) MS Remote sensing and GIS (NUST  
Islamabad) Visiting Lecturer

**Ms. Anum liaqut** M.Sc Geography ((P. U) M.Phil. ((P.U) Visiting Lecturer

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## FACULTY OF SCIENCE & TECHNOLOGY

### DEPARTMENT OF MATHEMATICS

#### OVERVIEW

Mathematics is a language to delineate every science and technology. The Department of Mathematics is one of the oldest and most diverse departments within the University, which covers Mathematics (both Pure and Applied) in different programs. It was established during pre-partition days. Mrs. Ali Muhammad was the head of department, when the college was shifted to the present building in 1951. Dr. Imrana Kausar is presently working as the Head of the Department.

Mathematics as a subject in BSc was introduced in 1958. M.Sc classes were initiated in 1996. Currently, department offers 4-years BS program, MS in mathematics and PhD in mathematics.

Graduates of the university are expected to apply their skills to solve multifaceted problems in an ever-changing world and mathematics plays a vital part in cultivating the skills and framework needed to tackle such challenges. It is also one of the best supporting subjects for many other disciplines. Graduates from the department take up positions in diverse fields like business, industry, planning and environmental organizations etc. If you are a potential undergraduate student, we invite you to join us in exploring the exciting opportunities.

#### LEARNING OBJECTIVES

- It is desired to produce a pool of students equipped with the tools and strategies necessary to provide solutions to the mathematical problems. The graduates must be capable of contributing to industrial, managerial and educational fields through their innovative approach.
- Students will be capable of problems identification and finding their optimal solution.
- To develop a cultural of innovative research

#### OUTCOMES

- Qualified graduates can serve the nation as teachers, researchers, bankers as well as entrepreneurs.
- The graduates can contribute as full time researchers in different research organizations and teachers.

#### DEGREE PROGRAMS OFFERED

- BS Mathematics
- BS Mathematics (Self-Support Evening Program)
- MS Mathematics
- PhD Mathematics

BS Mathematics	Physics, Statistics
Self Supporting BS Mathematics	Physics, Statistics

#### ELIGIBILITY CRITERIA

Overall first division in intermediate or equivalent exams. At least 60% marks in elective Mathematics of 200 marks.

## FACULTY OF SCIENCE & TECHNOLOGY

### MS PROGRAMS

MS Mathematics	***
PhD in Mathematics	***

### ELIGIBILITY CRITERIA FOR MS

- Sixteen years of education (BS/MSc)

### ELIGIBILITY CRITERIA FOR PhD

- Eighteen years of education (M.Phil/MS)

### DURATION OF EACH PROGRAM

BS Programs	4 years
MS Programs	2 years
Ph.D Program	3-5 years

### TOTAL CREDIT HOURS

BS Programs	135 CR
MS Programs	36 CR
Ph.D Program	18CR (Course Work) + Thesis

### LIST OF FACULTY

**Dr. Imrana Kousar** Chairperson/ Associate Prof. Ph.D., Specialization: Algebraic Graph Theory

**Dr. Misbah Irshad** Associate Prof., Ph.D. , Specialization: Digital Image Processing, Soft Computing

**Dr. Maria Hussain** Associate Prof., Ph.D. , Specialization: Computer Aided Geometric Design

**Dr. Uzma Bashir** Assistant Prof., Ph.D., Specialization: Computer Aided Geometric Design

**Dr. Mrs. Shazia Javed** Assistant Prof., Ph.D., Specialization: Digital Signal Processing, Optimization Theory

**Mrs. Shabana Zain** Assistant Prof., M. Phil

**Mrs. Sadia Jabeen** Assistant Prof., M.Sc.

**Mrs. Shazia Tariq** Assistant Prof., M. Phil

**Miss Shamsa Ishaq** Assistant Prof., M.Phil, Specialization: Ergodic Theory & Symbolic Dynamics

**Dr. Tahira Sumbal Shaikh** Assistant Prof., Ph.D., Specialization: Computer Aided Geometric Design

**Dr. Salma Kanwal** Assistant Prof., Ph.D. Specialization: Graph Theory

**Dr. Saima Nazeer** Assistant Prof., Ph.D., Specialization: Graph Theory

**Dr. Sehrish Iftikhar** Assistant Prof., Ph.D., Specialization: General Relativity & Cosmology

**Dr. Kanwal Nazir** Assistant Prof., Ph.D., Specialization: Modified Theories, Cosmology



## FACULTY OF SCIENCE & TECHNOLOGY

**Mrs. Marwa Khalid Cheema** Assistant Prof. M. Phil

**Mrs. Tayba Arooj** Lecturer, M. Phil , Specialization:Fractal Theory

**Dr. Sara Shafiq** Lecturer, Ph.D., Specialization: Semiring Theory

**Mrs. Naila Sajid** Lecturer, M. Phil

**Miss Sidra Saleem** Lecturer, M. Phil

**Mrs. Sana Zahra** Lecturer, M. Phil

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## FACULTY OF SCIENCE & TECHNOLOGY

### DEPARTMENT OF PHYSICS

#### OVERVIEW OF DEPARTMENT:

Physics is an existing intellectual adventure that inspires young people and expands the frontiers of our knowledge about nature. It generates fundamental knowledge needed for the future technological advances that will continue to drive the economic engines of the world. It contributes to the technological infrastructure and provides trained personnel needed to take advantage of scientific advances and discoveries. Physics is an important element in the education of chemists, engineers and computers scientists, as well as practitioners of the other physical and biomedical sciences. Physics extends and enhances our understanding of other disciplines, such as the earth, agricultural, chemical, biological, environmental science, astrophysics and cosmology subjects of substantial importance to all peoples of the world. It also improves our quality of life by providing the basic understanding necessary for developing new instrumentation and techniques for medical applications, such as CT scan, magnetic resonance imaging, positron emission tomography, ultrasonic imaging and laser surgery, nano medicine and drug delivery system.

The department of Physics was established in 1951. Mrs. Hajra Khan was the first head while Miss Naeema Mohsin, Mrs. Qaisra Shiraz Khan and Prof. Mrs. Yasmeen Ali were the other former heads of Physics department. Presently Prof. Dr. Rehana Zia is the head of Physics department. B.Sc classes were started in 1958 and later B.Sc (Hons) classes were conducted in the 1960's. M.Sc program was started in 1966. Ph.D program has been successfully launched in 2003. Currently department enroll students for 4 year BS (Physics) program, 2 year MS (Physics) and Ph.D. program.

#### LEARNING OBJECTIVES

- To provide sound basic education in Physics for students planning career in science, engineering and other disciplines.
- To encourage students to participate in research projects appropriate to their academic abilities and experience.

To prepare and train students for advanced studies and specialization in recently emerging technologies

- To encourage creativity analytical thinking, critical analysis and innovative problem solving skills.

To develop scientific attitude and demonstrate professional skills in teaching and research.

- To provide opportunity for considerable personal development

#### OUTCOMES

- Students have the ability to do small independent project and work independently with multi-disciplinary team.
- Students with advanced capabilities in leadership and management can provide significant intellectual contributions in the fields of Physics.
- Students can use the techniques, skills and modern scientific tools necessary for professional practice.
- Students can apply knowledge of Physics and other specialties in everyday of life.
- Students can conduct empirical research and think analytically



## FACULTY OF SCIENCE & TECHNOLOGY

### DEGREE PROGRAMS OFFERED:

- BS Physics
- MS Physics
- Ph.D. Physics

### BS PROGRAM (4-YEAR DEGREE PROGRAM)

#### ELIGIBILITY CRITERIA:

- Students who have passed Intermediate (Pre Medical) are not allowed for BS-Physics.
- Students who have passed Inter (Pre Engineering/ ICS) with more than 60% marks are allowed.
- A-Level and equivalent with good grades and pre-engineering subjects.
- All other requirements as per university policy (available on website).

**Duration:** 4 Years, **Total Credit hours:** 136

### MS PROGRAM (2-Year Degree Program)

#### Eligibility Criteria

- Minimum 16 years of education BS/MSc Degree in Physics or equivalent
- All other requirement as per University policy (available on website).

**Duration:** 2 Years, **Total Credit hours:** 36

### Ph. D PROGRAM

#### Eligibility Criteria

- Minimum 18 years of education M.Phil/ MS in Physics or equivalent is required in the relevant field.
- All other requirement as per University policy (available on website)

**Duration:** 3-5 Years, **18 Credit Hours for Course Work in 2-Semester**

### LIST OF FACULTY

**Prof. Dr. Zohra Nazir Kayani**, COD/Professor, M.Sc., Ph.D. (PU)

**Prof. Dr. Safia Iftikhar**, Professor/ director academics M.Sc. (LCWU), M.Phil (QAU), Ph.D. (UET)

**Dr. Rozina Chaudhary**, Associate Prof.M.Sc, (LCWU), M.Phil (GCU) Ph. D (GCU)

**Ms. Ghazala Shaheen**, Associate Prof.M.Sc., M.Phil (PU)

**Ms. Ambreen Mirza**, Associate Prof. M.Sc, M.Phil (PU)

**Mrs. Alliya Qamar**, Assistant Prof. M.Sc, M.Phil (PU)

**Dr. Lubna Mustafa**, Assistant Prof. (On Study Leave) M.Sc., M.Phil (PU), Ph.D. (LCWU)

**Dr. Riffat Sagheer**, Assistant Prof. M.Sc. (PU), M.Phil (UET), Ph.D. (LCWU)

**Mrs. Maryam Fayyaz**, Assistant Prof. M.Sc. (PU), MS (LCWU)

**Mrs. Farah Iftikhar**, Assistant Prof. M.Sc. (PU)

**Mrs. Ruby Shaheen**, Assistant Prof M.Sc. (PU) MS (LCWU)

**Dr. Aneeqa Sabah**, (TTS), Assistant Prof. M.Sc, M.Phil (PU), Ph. D (Thiland)

**Mrs. Sahar Tasleem**, Assistant Prof. M.Sc, M.Phil (PU)

## FACULTY OF SCIENCE & TECHNOLOGY

**Dr. Madeeha Riaz**, Assistant Prof. M.S, Ph. D (LCWU)

**Dr. Zeba Israr** (TTS), Assistant Prof. M.Sc, M.Phil Ph. D (GCU)

**Dr. Munazza Mohsin**, Assistant Prof. M.Sc (Pu), Ph. D (Austria)

**Dr. Salma Waseem**, Assistant Prof. M.Sc, M.Phil (PU), Ph.D. (LCWU)

**Dr. Shafaq Arif**, Assistant Prof. M.Sc, (GCU), M.Phil (UET), Ph.D. (LCWU)

**Dr. Talat Saeed**, Assistant Prof. M.Sc. (GCU), M.Phil(UET, Ph.D. (LCWU)

**Mrs. Afshan Rashid**, Lecturer M.Sc. (PU), MS (LCWU)

**Mrs. Hina Irfan**, Lecturer (On Study Leave) M.Sc. (PU), MS (LCWU)

**Dr. Saima Khalid**, Lecturer M.Sc. (GCU), M.Phil (UET), Ph.D. (LCWU)

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## FACULTY OF SCIENCE & TECHNOLOGY

### DEPARTMENT OF ZOOLOGY

#### OVERVIEW

Zoology department was established in 1956. Prof. Dr. Farkhanda Manzoor is the present head of the Department. Currently Zoology department enrolls students for 4 years Bachelors degree (BS Zoology), 2 years MS regular self-supporting evening program and Doctoral degree programs (Ph.D Zoology). A number of original research papers from the faculty and students have been published in refereed journals. Research projects from HEC and other funding agencies have been won by the faculty members and are successfully accomplishing. A biannual journal entitled 'Journal of Innovative Sciences' is also issued under the Society for Promotion of Science and Technology, Zoology Department, LCWU, Lahore. The journal has recently been awarded 'Z category' by Higher Education Commission of Pakistan. The Department successfully has organized "International Conferences on New Trends in Natural Sciences".

In 2019 Learning Innovation Division (LID) of HEC, in collaboration with Lahore College for Women University, organized a 3-days workshop on "New Curriculum of Zoology". HEC invited 23 faculty members from various Universities of Pakistan. Department of Zoology won the first of project of LCWU under Technology Development Fund Program of HEC "Introduction of innovative In-Pond Raceways System Technology in Pakistan". After years of underwhelming performance, the society was revived in 2015 by the honorable Chairperson, Prof. Dr. Farkhanda Manzoor who renamed the society to "Zoological Sorority" in honor of the female Zoology students. The sorority has since conducted annual events such as seminars, workshops, lectures, awareness walks and Milaad events. The annual Departmental year book was also launched in 2019 by the Sorority. Department conducted an awareness session and walk on Coronavirus for faculty members and students on 10th March, 2020.

#### LEARNING OBJECTIVES

- To impart knowledge about animal sciences through wide range of subjects related to natural sciences.
- To teach different methods of exploration, investigation, organization of data and its utilization in practical life with reference to animal biology.
- To prepare and train students for advanced studies and specialization in recently emerging technological and interdisciplinary fields such as Biodiversity, Wildlife and Conservation, Molecular Biology and genetics, Entomology, Parasitology, Aquaculture, Genetics, Physiology, immunology and Endocrinology.

#### OUTCOMES

After the completion of the degrees students will be able to have:

- Skill in asking relevant critical questions regarding animals and their ecological associations as well as finding, comprehending and summarizing relevant information on zoological topics.
- Prepare successfully to compete in job placement.
- Understand broadly how to use various instrumental techniques effectively and will be capable enough to provide mediatory steps for the specific areas of concerns.

## FACULTY OF SCIENCE & TECHNOLOGY

### DEGREE PROGRAMS OFFERED

- BS Zoology Morning self-support evening program
- MS Zoology Morning + self-supporting
- Ph.D. Zoology (Regular)

### BS PROGRAM

#### Eligibility Criteria:

- F.Sc. with Pre-medical with more than 60% marks
- A-Level and equivalent with good grades and pre-medical subjects.
- All other requirement as per university policy (please see university admission criteria for BS)

**Duration:** 4 years

**Total credit hours:** 136 CR

### MS PROGRAM

#### Eligibility Criteria for MS

- 16 years of education having BS/M.Sc. degree in Zoology or equivalent
- The candidates must have obtained 2.5/4.00 CGPA in semester or 50% marks in annual system.
- All other requirements as per University policy (available on university website).

**Duration:** 2 years

**Total credit hours:** 36

### SPECIALIZATIONS OFFERED\*

- Entomology and Vector Biology
- Environmental Biology
- Fisheries & Aquaculture
- Molecular Biology, Microbiology and Genetics
- Pathophysiology and Parasitology
- Physiology and Endocrinology
- Public Health

\* Specialization will be offered according to specialization requested by the student and availability of the faculty.

### Ph.D PROGRAM

#### Eligibility CRITERIA

- 18 years of education. MS/M.Phil in Zoology/ or Equivalent
- The candidates must have obtained 3.00/4.00 CGPA in semester or first division in annual system.
- Candidates working in Government/ semi-government institutions must have to submit NOC from concerned organization.
- All other requirement as per University policy (available on university website).
- Admission in Ph.D. program will be carried out twice a year, in spring and in autumn depending on the availability of the seats.

**Duration:** 3-5 years

**Total credit hours:** 18CR(Course Work )+ Thesis



## FACULTY OF SCIENCE & TECHNOLOGY

### SPECIALIZATIONS OFFERED\*

- Entomology & Vector Biology
- Environmental Biology/ Biodiversity
- Fisheries & Aquaculture
- Molecular Biology, Microbiology and Genetics
- Pathophysiology and Parasitology
- Physiology and Endocrinology
- Public Health

\* Specialization will be offered according to specialization requested by the student and availability of the faculty.

### LIST OF FACULTY

**Prof. Dr. Farkhanda Manzoor**, (Chairperson of Department) M.Sc., Ph.D. (PU), M. Ed. (Sci. Edu), Postdoc. (USA), PGD in Environmental Law (PU) Professor

**Prof. Dr. Farzana Rashid**, M.Sc., M.Phil. (PU), Ph.D. (BUCT, China), M. Ed. (Sci. Edu), Professor

**Dr. Husna Malik**, M.Sc. (PU), Ph.D. (LCWU) Associate Professor (For College Section)

**Dr. Saima Sharif**, M.Sc., Ph.D. (PU) Associate Professor (TTS)

**Dr. Sumera Sajjad**, M.Sc., M.Phil., Ph.D. (QAU) Assistant Professor (TTS)

**Dr. Farah Ashfaq**, M.Sc. (PU), Ph.D. (LCWU) Assistant Professor (For College Section)

**Dr. Shaqufta Naz**, M.Sc., M.Phil., Ph.D. (PU) B.Ed. (AIOU) Assistant Professor (TTS)

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**Dr. Zakia Kanwal**, M.Sc. (UAF), Ph.D. (Netherlands) Assistant Professor (TTS)

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**Dr. Mahnoor Pervez**, MS, Ph.D. (LCWU) Lecturer

**Ms. Ayesha Tahir**, MS, (LCWU) Lecturer

### Technical Staff

**Mr. Babar Amjad Khan**, Computer Lan Technician

**Mr. Naveed Ahmad**, Lecturer Assistant

**Mr. Taswar Hussain**, Lecturer Assistant

**Mr. Tariq Akhlaq**, Lecturer Assistant

**Iram Waqar**, Lecturer Assistant

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