

GRADUATE CATALOGUE

AKU Medical College

2023-2024



آغا خان یونیورسٹی

THE AGA KHAN UNIVERSITY

This document provides insights into the graduate programmes and courses available at AKU-MC (Aga Khan University - Medical College). The details provided here are subject to revision in accordance with the official information/material provided by the AKU Registrar's Office or on their official website.

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The Aga Khan University Medical College

The Aga Khan University (AKU) is a pioneering institution of higher education and research that is committed to the development of human capacities through the discovery and dissemination of knowledge, and application through service. We seek to prepare individuals for constructive leadership roles, fuel scientific discovery and shape policy. We believe in empowering women and the disadvantaged, strengthening pluralism and partnering with world-renowned institutions to address problems that affect millions of people.

A not-for-profit institution, the AKU Medical College was founded in 1983 by His Highness the Aga Khan. In the early 2000s, the University expanded its footprint to Kenya, Tanzania, Uganda, Afghanistan and the United Kingdom. At the Medical College, we attach great importance to the professional, personal and intellectual development of our students. Our aim is to produce responsible healthcare professionals who are not only contributing members of society but go on to become the next generation of leaders in their fields.

Our educational programmes adhere to the highest international standards, with the aim of developing professionals with excellent competencies and progressive life-long learning abilities, the drive to pursue excellence and improve the lives of the communities they serve. At AKU, students flourish in a supportive environment that embraces diversity, fosters learning, enables leadership and collaboration, and stresses finding novel solutions that are relevant to our local context. Our graduates go on to study and work at eminent universities and organizations around the world, making a different “whenever” they are.

AKU is open to all, regardless of race, religion, gender or geographic origin. Two-thirds of the students and half of the faculty members are women. Admission is based on merit, with a needs-sensitive financial assistance programme. While AKU does not discriminate on faith, gender or national origin, the student's acceptance is selective in nature. The selection process varies by academic programme, but a common criterion includes fluency in English.





Graduate Degrees Offered

The Graduate Programmes offered by the AKU Medical College are designed for professionals and basic scientists who have academic and research interests in disease aetiology and management of health care delivery systems, pertinent to Pakistan and developing countries. They feature continuous evaluation systems based on students' presentations, formal assessments of coursework, examinations and defence of the thesis/dissertation.

Following Graduate Programmes are being offered:

- PhD in Biological Sciences
- PhD in Population and Public Health
- PhD in Clinical Sciences
- PhD in Nursing
- Master of Philosophy in Biological and Biomedical Sciences
- Master of Health Policy and Management
- Master of Science in Epidemiology and Biostatistics
- Master of Science in Public Health
- Master of Health Professions Education



Doctor of Philosophy (PhD) in the Faculty of Health Sciences

The PhD programme in the Faculty of Health Sciences (FHS) at Aga Khan University is central to its mission of producing research based knowledge that is relevant to the developing world and which will have an impact. This is an interdisciplinary and multidisciplinary programme accredited by the Higher Education Commission (HEC) in Pakistan.

Following are the disciplines/streams in which PhD is offered:

- ▶ Biological Sciences
- ▶ Population and Public Health
- ▶ Clinical Sciences
- ▶ Nursing

Programme Director: Prof. Zahra Hasan

Description of PhD Disciplines/Streams

<p style="text-align: center;">Biological Sciences Dr Kiran Iqbal</p>	<p style="text-align: center;">Population and Public Health Dr Rozina Nuruddin</p>	<p style="text-align: center;">Clinical Sciences Dr Yawer Saeed</p>	<p style="text-align: center;">Nursing Dr Laila Ladak</p>
<p>Research training within this discipline will include studies in the fields of Anatomy, Biochemistry, Cell Biology, Immunology, Microbiology, Pathology, Pharmacology and Physiology. Candidates will be expected to undertake a novel doctoral thesis project in one of the above-mentioned fields.</p>	<p>The programme is designed for a wide variety of candidates, such as epidemiologists and biostatisticians, social and behavioural scientists, environmental scientists, health professionals and health administrators with an interest in population health. The principles of epidemiology, biostatistics, social and behavioural sciences, environmental health and health policy and management will form the core of this discipline. Through coursework, students would acquire a broad knowledge of the population and public health; they would be required to pursue an in-depth study in an area of specialization within the population health framework.</p>	<p>Clinical research involves interactions with patients, diagnostic clinical materials or data, or populations in the following areas: (1) disease mechanisms (etiopathogenesis); (2) clinical knowledge, detection, diagnosis and natural history of the disease; (3) therapeutic interventions including clinical trials of drugs, devices and instruments; (4) translational research; (5) behavioural research. This may also include health services research, including outcomes, and cost effectiveness. Doctoral-level training in clinical sciences will strengthen candidates' knowledge in a specific clinically important area with applications of research methodologies for conducting diverse clinical research.</p>	<p>The focus of this stream is to provide candidates with rigorous training in research that is offered through coursework and mentorship with the aim of developing clinical scholars and faculty members capable of scientific inquiry for innovative practice and knowledge development for human healthcare. Candidates will be required to produce an original piece of research that is important for human health from the perspective of nursing.</p>

SEMESTER ONE		
Course Code	Course	Credits
Core courses mandatory for all PhD students		
BIOS 9001 A008	Biostatistics in Health Care	3.0
PHDR 9001 A008	Scientific Writing	3.0
ETHC 9001 A008	Ethics in Healthcare Research	2.0
Total Semester Credits		8.0
SEMESTER TWO		
Biological Sciences-Discipline Specific Courses		
CELB 9001 A008	Cell and Molecular Biology I	3.0
CELB 900 5 A008	Cell and Molecular Biology II	3.0
Total Semester Credits		6.0
Clinical Sciences-Discipline Specific Courses		
CELB 9001 A008	Cell and Molecular Biology I	3.0
CELB 900 5 A008	Cell and Molecular Biology II	3.0
Total Semester Credits		6.0
Nursing Sciences-Discipline Specific Courses		
NURS 9001 A020	Theoretical Basis of Nursing II	3.0
NURR 9001 A020	Advanced Qualitative Research	3.0
Total Semester Credits		6.0
Population & Public Health-Discipline Specific Courses		
HSYS 9012 A008	Public Health: Principles, Surveillance & Socioeconomic Determinants	3.0
PHDR 9007 A008	Principles of Epidemiology & Research Ethics	3.0
Total Semester Credits		6.0

SEMESTER THREE		
Elective Courses (Biological Sciences, Population & Public Health & Nursing Sciences)		
PHDR 9002 A020	Mixed Method Research	3.0
PHDR 9005 A008	Design of Experiments & Regression Methods 1	3.0
HSYS 9002 A008	Comparative Organization of Health Care Systems	3.0
MGMT 9001 A008	Organizational Management	3.0
HSYS 9011 A0 08	Knowledge Synthesis: Systematic Reviews in Health and Social Sciences	
Total Semester Credits		6.0

Credit Hours	
Mandatory Courses	08
Stream Specific Courses	06
Elective Courses	06
Research	06
Total	26



MPhil in Biological and Biomedical Sciences

The MPhil in Biological and Biomedical Sciences is an interdisciplinary and multidisciplinary programme designed to produce competent, confident and productive biomedical scientists. The programme welcomes meritorious applicants from a wide range of disciplines within health sciences with a mission to educate them with broad-based integrated concepts of basic health sciences in the field of research-based education. The MPhil programme is accredited by the HEC, Pakistan and enables the graduates to have the choice to join academia, and the industry or pursue PhD studies as it dove-tails with AKU's PhD Programme in Health Sciences.

The programme offers MPhil in Biological and Biomedical Sciences in four specialities/streams:

- ▶ Anatomy
- ▶ Physiology
- ▶ Biochemistry
- ▶ Pharmacology

Programme Director: Prof. Rehana Rehman

SEMESTER ONE

Course Code	Course	Credits
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Core courses mandatory for all MPhil

HSYS-8001-A028	Cellular, Molecular & Genetic Sciences: Knowledge and Application	4.0
BBSR-8001-A028	Research Methodology	3.0
BIOS-8001-A028	Biostatistics and Data Visualization in R	3.0
SMNR-8001-A028	Research Seminars in Health Sciences	3.0
Total Semester Credits		13.0

SEMESTER TWO

Elective Courses (select three as per the stream)

HSYS-8010-A028	Clinically and Radiologically Oriented Human Anatomy (Anatomy)	4.0
HSYS-8006-A028	Principals of Laboratory Animal Sciences (Anatomy/Physiology/Biochemistry/Pharmacology)	4.0
HSYS-8003-A028	Neurosciences(Anatomy/Physiology)	4.0
HSYS-8002-A028	Cardiovascular and Respiratory Sciences (Anatomy/Physiology/Biochemistry)	4.0
HSYS-8008-A028	Essentials of Pharmacology and its Applications in Clinical Medicine (Pharmacology)	4.0
HSYS-8004-A028	Endocrine and Reproductive Sciences (Anatomy/Physiology/Biochemistry/Pharmacology)	4.0
HSYS-8005-A028	Insight into Adverse Drug Reactions (Anatomy/Physiology/Biochemistry/Pharmacology)	4.0
	Pharmacoepidemiology: vision and application (Pharmacology)	4.0
HSYS-8009-A028	Bioinformatics(Biochemistry)	4.0
HSYS-8007-A028	Introduction to Microbiology and Immunology (Biochemistry)	4.0
HSYS-8005-A028	Contemporary Concepts in Cancer and Virology (Anatomy/Physiology/Biochemistry/Pharmacology)	4.0
Total Semester Credits		6.0

Note: Selection of elective courses will be based on availability of courses and stream requirements

Credit Hours	
Mandatory Courses	13
Subject Specific Courses	12
Research Thesis	06
Total	31



Master of Health Policy and Management

The Master of Health Policy and Management (MHPM) is a pioneering programme in Pakistan, designed to train professionals from developing countries to address the challenges in the domains of the health system environment including health planning, policy analysis, institutional management and health systems research and development. The programme is recognized by the HEC, Pakistan, and offers high-quality education in a blended learning style with both, theory and practice.

The programme offers full-time and part-time study options. It also offers standalone courses in:

- ▶ Health Promotion
- ▶ Education and Advocacy
- ▶ Organisational Management
- ▶ Quality Management in Health Services

Programme Director: Dr Narjis Rizvi

SEMESTER ONE

Course Code	Course	Credits
MGMT-7001-A029	Organizational Management	3.0
HSYS-7011-A029	Public Health: Principles, Surveillance & Socioeconomic Determinants	3.0
HSYS-7004-A029	Comparative Organization of Healthcare Systems	3.0
HPMR-7003-A029	Biostatistics & Survey Sampling Methods	3.0
Total Semester Credits		12.0

SEMESTER TWO

HPMR-7002-A029	Research Design & Methods	4.0
HPMR-7001-A029	Protocol Development & Literature Review	3.0
HSYS-7008-A029	Human Resources for Health	3.0
Total Semester Credits		10.0

SEMESTER THREE

HSYS-7007-A029	Health Policy Formulation & Analysis	3.0
HSYS-7012-A029	Quality Management in Health Services	3.0
HSYS-7009-A029	Health Economics & Financing	3.0
Elective Courses (select one)		
HSYS-7010-A029	Health Sector Reform & Evaluation	3.0
HSYS-7003-A029	Health Promotion & Advocacy	3.0
HSYS-7002-A029	Reproductive Health: Policy & Programme Management	3.0
Total Semester Credits		12.0

Note: Selection of elective courses is based on the availability of courses in a particular semester

SEMESTER FOUR

Course Code	Course	Credits
HSYS-7005-A029	Public Health Law & Ethics	3.0
Elective Courses (select one)		
MGMT-7002-A029	Strategic Planning	3.0
HSYS-7006-A029	Economic Evaluation: Theory & Practice	3.0
Total Semester Credits		6.0

Credit Hours	
Mandatory Courses	34
Elective Courses	06
Research Thesis	06
Total	46



Master of Science in Epidemiology and Biostatistics

The Master of Science in Epidemiology and Biostatistics (MSc-Epi&Bio) programme is designed to train health professionals to have an in-depth knowledge of epidemiology, biostatistics and their application in analysing major health issues, with a focus on regional problems and needs in the developing country context. Graduates of the programme are enabled to play a leading role in the field of community health by analysing major issues and problems within the communities. The programme also offers specialisation in clinical research.

This track is designed for academicians, clinical researchers, residents, fellows, nurses, young faculty and individuals in medical and allied fields who wish to pursue a career in clinical cum research work.

The programme offers full-time and part-time study options. It also offers selected courses as "Standalone Courses" for individuals wishing to enhance their knowledge in specific areas.

Programme Director: Dr Shafquat Rozi

Clinical Research Track

SEMESTER ONE		
Course Code	Course	Credits
EPBR-7011-A005	Principles of Epidemiology & Research Ethics	3.0
EPBR-7012-A005	Biostatistics & Survey Sampling Methods	3.0
HSYS-7009-A005	Public Health: Principles, Surveillance & Socioeconomic Determinants	3.0
EPBR-7009-A005	Evidence-based Literature & Systematic Reviews	3.0
Total Semester Credits		12.0
SEMESTER TWO		
EPBR-7008-A005	Critical Appraisal of Literature & protocol development	3.0
EPBR-7001-A005	Study Design	3.0
EPBR-7014-A005	Design of Experiments & Regression\ Methods I	3.0
	Research Methods & Applications for Digital Health (CRT Specific)	3.0
Total Semester Credits		9.0
SEMESTER THREE		
EPBR-7015-A005	Multivariate Analysis and Regression Methods II	3.0
EPID-7006-A005	Advanced Epidemiology	3.0
	Quality Management of Health Services (CRT Specific)	3.0
	Pharmacoepidemiology & Advanced Topics in Clinical Trials (CRT specific)	3.0
Total Semester Credits		12.0

SEMESTER FOUR		
EPBR-7010-A005	Data Management & Scientific Writing for Publications	3.0
	Thesis	6.0
Total Semester Credits		9.0

Credit Hours	
Mandatory Courses	30
Elective Courses	09
Research Thesis	06
Total	45

Note: Selection of elective courses is based on the availability of courses in a particular semester

Regular Track

SEMESTER ONE		
Course Code	Course	Credits
EPBR-7011-A005	Principles of Epidemiology & Research Ethics	3.0
EPBR-7012-A005	Biostatistics & Survey Sampling Methods	3.0
HSYS-7009-A005	Public Health: Principles, Surveillance & Socioeconomic Determinants	3.0
EPBR-7009-A005	Evidence-based Literature & Systematic Reviews	3.0
Total Semester Credits		12.0

SEMESTER TWO		
EPBR-7008-A005	Critical Appraisal of Literature & protocol development	3.0
EPBR-7001-A005	Study Design	3.0
EPBR-7014-A005	Design of Experiments & Regression\ Methods I	3.0
Elective Courses (select one)		
EPID-7014-A005	Infectious Diseases & Environmental Epidemiology	3.0
EPID-7016-A005	Nutrition & Non-Communicable Diseases Epidemiology	3.0
Total Semester Credits		12.0

SEMESTER THREE		
EPBR-7015-A005	Multivariate Analysis and Regression Methods II	3.0
EPID-7006-A005	Advanced Epidemiology	3.0
Out of three, two electives should be selected		
EPBR-7013-A005	Demography & Reproductive Health Epidemiology	3.0
HSYS-7011-A005	Research in Injury Prevention & Control	3.0
HSYS-7012-A005	Research Methods in Mental Health	3.0
Total Semester Credits		12.0

Note: Selection of elective courses is based on the availability of courses in a particular semester

SEMESTER FOUR		
EPBR-7010-A005	Data Management & Scientific Writing for Publications	3.0
Thesis		6.0
Total Semester Credits		9.0

Credit Hours	
Mandatory Courses	30
Elective Courses	09
Research Thesis	06
Total	45



Master of Science in Public Health

The Master of Science in Public Health (MSPH) programme is designed to address the ever-evolving need for trained public health professionals in Lower Middle-Income Countries (LMICs) of the region. The programme is recognised by HEC, and through its innovative curriculum, aims to develop public health leaders to manage and find solutions to the plethora of health problems the population of Pakistan and countries in the region face.

To cater to the needs of professionals, the programme also offers part-time study options.

Programme Director: Dr Asaad Nafees

SEMESTER ONE

Course Code	Course	Credits
MPHR-7002-A030	Principles of Epidemiology & Research Ethics	3.0
MPHR-7001-A030	Biostatistics & Survey Sampling Methods	3.0
HSYS-7002-A030	Public Health: Principles, Surveillance & Socioeconomic Determinants	3.0
HSYS-7001-A030	Comparative Organization of Healthcare Systems	3.0
Total Semester Credits		12.0

SEMESTER TWO

HSYS-7002-A030	Protocol Development & Literature Review	3.0
MPHR-7003-A030	Behavioural and Social Science Approach in Public Health	3.0
Elective Courses (select two)		3.0
To be confirmed	Public Health Approach of NCD	
HSYS-7011-A030	Reproductive Health: Concepts & Applications	3.0
To be confirmed	Study Design	3.0
MPHR-7004-A030	Evidence-based Literature & Systematic Review	3.0
HSYS-7005-A030	Design of Experiments & Regression Methods-I	
MPHR-7005-A030	Research Methods & Applications for Digital Health	
Total Semester Credits		12.0

SEMESTER FOUR

To be confirmed	Global Health	
Total Semester Credits		

SEMESTER THREE

HSYS-7006-A030	Environment and Climate Change	3.0
Elective Courses (select three)		
HSYS-7007-A030	Quality Management in Health Services	3.0
HSYS-7008-A030	Demography & Reproductive Health Epidemiology	3.0
HSYS-7004-A030	Public Health Nutrition	3.0
MPHR-7006-A030	Research in Injury Prevention & Control	3.0
MPHR-7007-A030	Research Methods in Mental & Behavioural Health	3.0
HSYS-7009-A030	Human Resources for Health	3.0
MGMT-7001-A030	Organizational Management	3.0
To be confirmed	Public Health Approach to NCD prevention and control	3.0
To be confirmed	Reproductive Health: Policy & Program Management	3.0
Total Semester Credits		3.0

Credit Hours	
Mandatory Courses	24
Elective Courses	15
Research Thesis	06
Total	45



Master of Health Professions Education

The goal of the Master of Health Professions Education (MHPE) programme is to develop excellent teachers, innovators, researchers and leaders in health professions education. The programme is designed to produce educationists who can use the best evidence in education to make informed decisions for improving the standards of undergraduate, postgraduate and continuing health professions education within the region and beyond. The programme is accredited by the HEC in Pakistan.

Programme Director: Dr Tabassum Zehra

SEMESTER ONE-(February-June, 2022)

Course Code	Course	Credits
HPED-7002-A017	Curriculum Development in Health Professions Education	4.0
HPED-7004-A017	Programme Evaluation in Health Professions Education	3.0
HPED-7010-A017	Quantitative Research Methodologies in Health Professions Education	4.0
Total Semester Credits		11.0

SEMESTER TWO-(August to December, 2022)

HPED-7011-A017	Qualitative Research Methodologies in Health Professions Education	3.0
HPED-7020-A017	Issues in Health Professions Education	4.0
HPED-7005-A017	Leadership in Health Professions Education	4.0
Total Semester Credits		11.0

SEMESTER THREE-(January to April, 2023)

HPED-7016-A017	Teaching & Learning I in Health Professions Education	3.0
HPED-7017-A017	Teaching & Learning II in Health Professions Education	4.0
ELEC-7004-A017	Cognitive Psychology	3.0
Total Semester Credits		10.0

Note: Selection of elective courses is based on the availability of courses in a particular semester

SEMESTER FOUR-(July to October, 2023)

Course Code	Course	Credits
HPED-7018-A017	Assessment I in Health Professions Education	3.0
HPED-7019-A017	Assessment II in Health Professions Education	4.0
To be confirmed	Elective	3.0
Total Semester Credits		10.0

Credit Hours	
Mandatory Courses	36
Elective Courses	06
Research Thesis	06
Total	48

Course Description

MPhil Biological and Biomedical Sciences (BBS)

Courses in the catalogue are subject to changes and availability. Students are advised to contact programme directors for details.

HSYS-8001-A028 | 4.0 | Dr Fazal Arain **Cellular, Molecular & Genetic Sciences: Knowledge and Application**

This course lays the foundations of multidisciplinary integrated concepts of anatomy, biochemistry and physiology on one hand, and microbiology, pathology and pharmacology on the other hand. It is designed to elucidate the relationships between cell biology, molecular biology and molecular genetics by connecting how cell functions are driven by molecules and are controlled by genes. It provides an opportunity for students to learn and investigate the basics of cell biology, molecular biology and molecular genetics and integration of these concepts to develop a better understanding of physiological processes.

BBSR-8001-A028 | 3.0 | Dr Rehana Rehman **Research Methodology**

The course assists students in identifying, discussing and formulating a research problem, and enables graduate students in selecting and applying appropriate research approaches, data management and presenting their results. It helps students to understand why a particular research approach and methodology is more applicable than others for specific research questions.

BIOS-8002-A028 | 4.0 | Dr Najeeha Iqbal **Biostatistics and Data Visualization in R**

This course has been designed to address given challenges in basic science research. We are moving away from old bench science research to multi-omics and data-driven hypothesis-based research. Our students are not prepared for such challenges and don't carry the arsenal of data tools that have prime importance in the next level of research as Ph.D. or Post-doctoral fellows. Moreover, this course will provide an overview of the Biostatistics and laboratory Mathematics and Data visualization, with specific emphasis on learning R studio and R software to analyze, interpret complex data sets related to biological sciences, commonly used in NGS, Mass-Specs platforms. The course includes the introduction of selected biological data sets available online for modeling and generating new hypotheses to enable basic scientists to think out of the box and design new experiments with an unconventional approach. This can only be achieved when students are exposed to modern tools and technologies such as learning R software, and analyses of big data sets.

SMNR-8001-A028 | 3.0 | Dr Zuhair Yusuf **Research Seminars in Health Sciences**

This course introduces students to multidisciplinary research done in major thematic areas inside and outside AKU. The goal of this course is to develop an understanding of cutting-edge research being carried out worldwide. This module will burnish their presentation and critical thinking skills while promoting their generic interests in the research arena.

HSYS-8010-A028 | 4.0 | Dr Zuhair Yusuf
Clinically and Radiologically Oriented Human Anatomy

This course provides students with a greater understanding of advanced human anatomy including appropriate radiological anatomy, microscopic anatomy and embryology. The modules presented emphasize clinically- and surgically-relevant anatomy and are aimed exclusively at health professionals. Students have access to anatomy books in the FHS library and during the practical sessions have access to human cadaveric and plastic teaching material in a purpose-built facility of Anatomy Learning Studio.

HSYS-8006-A028 | 4.0 | Dr Tashfeen Ahmad
Principals of Laboratory Animal Sciences

This course develops an understanding of the core concepts required to carry out preclinical studies involving laboratory animals or animal specimens. It is designed in an integrated manner composed of multidisciplinary elements of teaching and research involving the development of animal models reflecting human ailments. This course will develop a thorough understanding of the ethical use of animals, the rationale for using animals, the selection of specific animal species in multidisciplinary research and the translational value of animal-based diseased models.

HSYS-8008-A028 | 4.0 | Dr Salman Siddiqui
Essentials of Pharmacology and its Applications in Clinical Medicine

This course will comprehend students' concepts regarding the rational drug prescription and use of medicines, as well as major classes, clinical uses and therapeutic index of important medications used to treat different diseases e.g. cardiovascular, neurological, and respiratory. It will also focus on therapeutic options for diabetes, peptic ulcer, cancer and viral infections patients. This course will provide an in-depth understanding of pharmacodynamic impact of these medicines such as therapeutic action (s) and underlying mechanism (s) including molecular pathway(s). Furthermore, it will encompass the pharmacokinetics (absorption, distribution, metabolism and excretion) of these drugs. This course will augment their competence to pursue their career in medical, biomedical sciences, and research.

HSYS-8003-A028 | 4.0 | Dr Fazal Arain
Neurosciences

This course deals with multidisciplinary integrated concepts of the nervous system. This understanding of basic science concepts enables students to understand clinical problems and derive solutions. This knowledge will form the basis of evidence-based medicine from bench to bedside. The analysis of current scientific literature on the topics will be critically debated in the context of premise and conclusion.

HSYS-8002-A028 | 4.0 | Dr Satwat Hashmi
Cardiovascular and Respiratory Sciences

This course deals with the multidisciplinary integrated concepts of heart, circulation and respiration components of human physiology. The understanding of basic science concepts enables students to understand clinical problems to derive solutions. This forms the basis of evidence-based medicine from bench to bed.

HSYS-8004-A028 | 4.0 | Dr Rehana Rehman
Endocrine and Reproductive Sciences

This course deals with multidisciplinary integrated concepts of Endocrine and Reproductive system. This understanding of basic science concepts enables students to understand clinical problems to derive solutions. This knowledge will form the basis of evidence based medicine from bench to bedside.

HSYS-8005-A028 | 4.0 | Dr Shagufta Khan
Insight into Adverse Drug Reactions

This course provides students with sound concepts regarding the adverse effects of drugs including the underlying mechanism(s). It enables students to understand the pharmacodynamics of drugs at molecular, cellular, tissue and system levels. This course also focuses on the possible safe use of medicine, identification of adverse drug reactions as well as their management options in different populations including pregnant women, nursing mothers, pediatric and geriatric. It provides students with knowledge and practical skills to pursue their career in medical and biomedical sciences, education and research.

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Pharmacoepidemiology: vision and application

This course helps students in understanding the basic principles of clinical pharmacology, pharmacoepidemiology and their application in research. It includes a range of basic concepts and few advance concepts that are necessary for understanding pharmacoepidemiology. Initially, the course introduces the basic principles and methods of epidemiology and application to clinical pharmacology (pharmacoepidemiology) and clinical research. It then introduces the drug testing process and approval by regulatory authorities. The use and selection of different study designs are discussed to evaluate the utilization, effectiveness and safety risks of pharmaceutical products. Practical issues related to pharmacoepidemiology research will be introduced including bias and confounding, ethical issues, and conflict of interest. Finally, the applications of pharmacoepidemiology in rational drug use and therapeutic risk management as well as relevant policies and regulations are discussed to guide the students for good practice.

HSYS-8009-A028 | 4.0 | Dr Ambrin Fatima
Bioinformatics

In the age of contemporary biology, the use of computers has become a necessity. Since the completion of the Human genome project, the amount of genomic and proteomic data available in the databases or generated in different laboratories has grown at an exponential rate. Analysis of such huge data is simply impossible for humans; therefore, computational biology or bioinformatics has emerged as a field concerned with storage, manipulation, extraction, and analysis of valuable information from all this new data. Developing an understanding of the principles, processes and techniques in the field of computational biology has become incumbent for any science student considering a degree in any area of biology.

HSYS-8007-A028 | 4.0 | Dr Fareena Bilwani
Introduction to Microbiology and Immunology

The microbiology component of this course covers topics such as bacterial taxonomy, classification, nomenclature; nutritional requirements for bacterial growth, sterilization technique, diagnostic microbiology, antimicrobial therapy and drug resistance. In the immunology part, students are introduced to the integrated function of the cells and the molecules of the innate and adaptive arms of the immune system. In addition, students conceptualize the process by which innate immunity kicks in an adaptive immune response. In addition to tumour immunology, it also touches upon current concepts of host-microbe interaction, mucosal immunology, and the immunological basis of vaccines.

HSYS-8011-A028 | 4.0 | Dr Kulsoom Ghias

Contemporary Concepts in Cancer & Virology

Hallmarks of cancer, such as evasion of apoptosis and angiogenesis, underlie the onset and progression of cancer. Like cancer cells, viruses hijack physiological processes to initiate and sustain tumour growth. Viruses can also bring about changes in the cell milieu, such as produce chronic inflammation, or induce chronic immune activation which leads to onset or progression of cancer. Viruses also can evolve in response to immune or drug pressures that can affect the virus interaction with the cell. Overall, these processes can affect the disease outcome. The course utilizes classic and contemporary literature to critically analyse the pathways and processes involved in viral pathogenesis, carcinogenesis, and viral oncogenesis.

The course will introduce contemporary molecular concepts in the areas of Cancer, Virology, and Viral Oncology through critical reading of scientific literature, and through supporting lectures delivered by the contributing faculty.

HSYS-8013 –A028 | 4.0 | Dr Fazal Arian

Brain-Body Axis: Development, Structure and Function (Anatomy/Physiology)

This course is intended to help students develop multidisciplinary integrated concepts of the nervous system and its association with anatomy. It will enable students to relate the developmental origins of the nervous system with the function of the human body as well as differentiate the development, structure and function of the brain-body axis and body-brain loop. It will also help the students to understand the relationship of cellular organization and electrochemical communication of the nervous system with body functions. The students will learn the mechanisms and processing of neural pathways involved in sensory and motor functions.

Course Description

Community Health Sciences (CHS)

MGMT-7001-A029 / MGMT-7001-A030/ MGMT-9001-A008
Organizational Management | 3.0 | Dr Ahsana Nazish

This course is intended to help students gain a better understanding of some of the common challenges that managers regularly face in organizations. By understanding these challenges, students will be more prepared to successfully manage and lead the organizations where they belong. This course will introduce students to central theories, principles, and frameworks about managing organizations and will help participants understand and apply these ideas to their own experiences. In this course, students will examine ways in which organizations can be structured to effectively respond to changes in the external environment. They will learn effective management skills required to facilitate change and achieve results through efficient mobilization and utilization of the workforce and other resources. Students will learn about organizational culture and begin to uncover some of the ways that managers can influence culture.

HSYS-7004-A029/ HSYS-7001-A030 | 3.0 | Dr Narjis Rizvi
Comparative Organization of Health Systems | Dr Sana Hyat

This course builds students' knowledge in health systems development through introduction of essential health system's building blocks as defined by World Health Organization. The course also familiarizes students about the health system issues and challenges with special reference to Low-And-Middle-Income Countries (LMICs) including Pakistan. Case studies are presented describing different models of healthcare systems from high-, middle- and low-income countries. Through this, students' understanding of health system and its components will be widened. Moreover, they will acquire skills to critically appraise different health systems/organizations and identify their relative strengths and limitations. The course is highly interactive relying on interactive lectures, group discussions, field visits and students' presentations.

Courses in the catalogue are subject to changes and availability. Students are advised to contact programme directors for details.

3.0 | Dr Hasan Salman Siddiqi

Pharmacoepidemiology & Advanced Topics in Clinical Trails

First part of course will include a range of basic concepts and few advanced concepts that are necessary for understanding Pharmacoepidemiology. Initially it will focus on understanding the basic principles of epidemiology and their application to Pharmacoepidemiology, followed by drug approval and testing process and the data sources will be discussed in detail. Use and selection of different study designs will be introduced to evaluate the pharmaceutical products, their safety, effectiveness and utilization. Moreover, some practical issues related to research will be introduced that will include bias and confounding, ethical issues, cost effectiveness, conflict of interest, adherence and persistence in Pharmacoepidemiologic research. Finally, the applications of Pharmacoepidemiology studies in rational drug use and therapeutic risk management as well as relevant policies and regulations will be discussed to guide the students for good practice.

Second part of course addresses clinical trials specifically comprising of three modules: 1) An in-depth review of trial design, including a review of randomized controlled trials and cluster-randomized trials from the Study Design course. The introduction of specialized trial design strategies, including factorial design, step-wedge design, equivalence/non-inferiority trials, cross-over trials, and other trial designs. The course will provide an introduction to statistical methods for trials, including sample size estimation and analytic approaches. 2) A review of key regulatory, ethical and procedural requirements for conduct of clinical trials, including details of the good clinical practice procedures, IRB/ERC requirements, clinical trial registration, as well as data safety and monitoring. 3) Specific challenges for clinical trials in different clinical specialty areas including vaccinology, oncology, neurology, maternal-child health and HIV/AIDS.

HPMR-7003-A029/ EPBR-7012-A005/ MPHR-7001-A030
/EPBR- 9012-A005 | 3.0 | Ms Fauzia Hasnani
Biostatistics & Survey Sampling Methods (BSSSM)

This course is centred around basic statistical principles and different methods of survey sampling with their application to quantitative research in health sciences. The purpose is to help students understand and apply the basic descriptive and inferential statistical techniques and important survey sampling methods with application in health sciences. It will draw on examples of basic biostatistics, probability, inferential statistics (estimation and hypothesis testing) for means, proportions and variances, non-parametric tests, different terminologies used in survey sampling, sampling techniques, sample size determination, and different techniques to determine the population size in biological and environmental sciences. Students will be introduced to Statistical package STATA. Assessment will be through home assignments, quizzes, class presentations and seminar, and mid and end-of-semester examinations

HPMR-7002-A029 | 4.0 | Dr M. Asim, Dr Uzma Shamsi
Research Design & Methods (Qualitative & Quantitative)

The purpose of this course is to help students develop a theoretical, practical, and critical understanding of the epidemiologic (quantitative) and the qualitative research paradigms, the scope of the two, core concepts, respective designs, principles & methods, correct vocabulary and their appropriate applications & interpretation in population health and Health Systems Research (HSR). In practice, it has become increasingly important to apply the mixed methodology approach for population health, systems & policy research. Broadly, this course has much to offer to those studying health sciences, epidemiology, health systems & services and policy development. This will also be helpful for students in carrying out health, policy, social science and implementation research within health delivery systems.

EPBR-7001-A005/ PPHR-9001-A008
| 3.0 | Dr Bilal Ahmed Usmani
Study Design

A quantitative approach of epidemiology has served public health in the past in defining health problems (what) and for computing the magnitude of health problems according to time place and person characteristics (when, where, and who) as well as for determining the causes of these problems (why and how) thus generating numerical data through clinical trials and observational studies. Then the emergence of social medicine led to the paradigm shift and social epidemiology surfaced. New methodologies evolved for understanding the complex social phenomenon relative to human behaviour and the “qualitative approach” has gained ground as a valid method for comprehending the “social reality” as it exists. The qualitative approach aims to develop an in-depth understanding of the social phenomenon, selection of variables, indices, tool development or modifications and verification or triangulations of findings. This course builds on the basic understanding of study design developed in the Principles of Epidemiology course and will extend the conceptual base for study designs (quantitative, Mixed Methods (MM)). During the first two third of the semester period, the course will cover advanced principles and application of different quantitative research study designs such as cross-sectional, case-control (with its variants), cohort and ecological studies. In addition, we will also provide students with an introduction to the theoretical underpinnings of experimental study design and their application to relevant research questions. During the later portion of the course, we will introduce the most commonly used qualitative research methodologies which are appropriate for the mixed methods approach.

HSYS-7013-A005/ MPHR-7005-A030

3.0 | Dr Abdul Momin Kazi, Dr. Shafquat Rozi
Research Methods & Applications for Digital Health

Today digital health makes high quality healthcare accessible to hard-to-reach areas. As health systems undergo digital transformation, it is important to consider informatics approaches in curriculum content, research and for learning activities of health professionals. According to the WHO estimates, there is a shortage of around 4.3 million physicians, nurses and allied health workers worldwide and at the same time need of health services is rising. Therefore, digital technologies of all kinds have become essential resources in health care and their utilization is growing even further in the coming era. This course is unique in the country and the region as no such course is being offered by any other education institutions currently in LMIC's. It will increase digital health awareness among health care professionals, build their capacity, and support them to effectively design and implement research methods in digital health. The curriculum will enable health care personnel to adopt and apply digital health applications effectively.

EPBR-7008-A005 | 3.0 | Dr Muslima Ejaz

Critical Appraisal of Literature & Protocol Development (CAPD)

The overall objectives of this course are to enable students to acquire skills in elements of research design and conduct a study, answering a specific research question. The course aims to impart skills in critically analyzing research papers with the purpose to identify a research question, focusing on the development of the research protocol.

EPBR-7009-A005/ MPHR-7004-A030/ CLTR-9001-A008/

EPBR-7009-A005 | 3.0 | Dr Shiyam Sunder Tikmani
Evidence-based Literature & Systematic Review

Through this course, students will be able to critically appraise available clinical evidence related to therapy, prevention, application of a diagnostic test, and prognosis for making decisions in clinical care/public health. Through interactive sessions, presentations and journal club participation, students will be able to acquire knowledge and skills to perform Systematic Review. Moreover, students will learn how to conduct a literature search and develop a search strategy for Systematic Reviews. This in turn will help them to formulate research question/s for therapy, prevention, diagnostic tests, prognosis, harm, and systematic reviews, describe principles of systematic review for Randomized Control Trials, and differentiate between strengths of clinical evidence and grades of recommendation. The assessment for this course involves JC presentation, peer assessment, facilitator assessment, end of course exam, and final report of Cochrane protocol.

HPMR-7001-A029/ HSYS-7002-A030

| 3.0 | Mr Waqas Hameed

Protocol Development & Literature Review

This course enables students to develop a research proposal with a focus on health system research. The course would sequentially take students through the steps of identification of important areas of public health research (in particular health systems research) with statement of the problem and formulating research question, review the current state of available evidence, critical appraisal of available evidence, conceptual framework, study design, variables and their level of measurement, sampling frame and sample size, analysis plan, ethical standards and consideration, management concerns and feasibility. The course will also introduce the student to the basic steps for conducting systematic review. Secondly, it also introduces students to introduction to a public health program implementation, coverage and quality of services. The project development component will enable participants to acquire the skills of writing a proposal for developing a public health project or program. Students will be given an opportunity to present an outline of the project/program that they have developed.

HSYS-7007-A029

| 3.0 | Dr Shifa Habib

Health Policy Formulation & Analysis

This course is planned to familiarize students with the importance of policy formulation and analysis in the context of the wider health system. It will provide an understanding of different expressions of policy and the intricacies of the policy process. The course will highlight issues such as interaction among various stakeholders, power structures and players, political decision-making, and the influence of external political factors on agenda setting, policy formulation and implementation. A policy framework will assist in analyzing policy success and failures and assessing policy options. The course will also focus on issues and challenges pertinent to health policy in developing countries. Student learning and analytical understanding will be consolidated with case studies as well as specific readings on different topics through selected texts.

HSYS-7008-A029/ HSYS-7009-A030

| 3.0 | Dr Narjis Rizvi

Human Resources for Health

The course emphasizes the importance of human resource in improving health outcomes. It introduces the basic concepts, approaches and models for human resource analysis, planning and management. It builds on the concept of health labour markets and their influence on health workforce planning. The course also introduces the World Health Organization's 'Workforce Indicators for Staffing Needs (WISN)' software that can be used to determine the staff requirements of a health institution/entity. Strategies for effective workforce management are also presented including leadership, training & development, motivation, communication, and supportive supervision. Students are familiarized with tools that enhance human resource management capacities such as job description, and performance appraisal and incentives.

HSYS-7012-A029/ HSYS-7007-A030

| 3.0 | Dr Narjis Rizvi

Quality Management in Health Services

This course offers a 'systems approach' to quality management in health-care. The course introduces various methodologies for both measuring and improving healthcare quality. Methods will be introduced to develop quality improvement plans for defect prevention, continuous process improvement, and outcome-driven systems guided by patients' needs. It will present techniques that measure aspects of the structures, processes and outcomes of care, as well as levels of patient satisfaction. It familiarizes students with regional systems (e.g. EMRO / WPRO) which utilize these quality measurement techniques to evaluate and improve quality. Students will be able to apply quality improvement skills to address the organization's operational challenges. They will be provided an opportunity to apply these methods in two settings including hospitals (public and private) and non-government healthcare organizations.

HSYS-7009-A029

| **3.0** | **Dr Ashar Malik**
Health Economics & Financing

The course emphasizes the role of health economics theories and skills that are essential for better analysis of health policies, programs, and healthcare management. With the help of skills developed in this course, participants will be able to broaden their perspectives on public health and medical care. This course will provide an opportunity for participants to learn the application of methods of health economics to their respective professional settings for example uniqueness of health and health spending, healthcare market structures, supply and demand mechanisms, and the economic aspect of disease epidemiology. The particular focus of the course is healthcare markets and health systems of regional countries including Pakistan developed.

HSYS-7010-A029

| **3.0** | **Dr Maryam Huda**
Health Sector Reform & Evaluation

This course will provide support to the participants to familiarize themselves with a structured approach for identifying health sector deficiencies and developing sustainable reform policies to improve health system's performance. The course enhances critical thinking on what is meant by health sector reform, its conceptual basis and exposes participants to different aspects of reform including financing, regulation, purchasing, organization etc., in the context of low- and middle-income countries. Furthermore, it develops essential skills of monitoring and evaluation of health sector performance, adoption of appropriate tools and frameworks, and identification of key performance indicators to track progress on reform initiatives.

HSYS-7003-A029

| **3.0** | **Dr Zarak Ahmed**
Health Promotion, Education & Advocacy

Enables students to identify and address the key health problem, undertake the health needs assessment across multiple domains (social, epidemiological, behavioural, environmental, educational, ecological and policy), and propose health promotion interventions programs in various settings. While developing the health promotion program, students will also learn practical tools for program monitoring and evaluation. The course will also facilitate learners to develop "behavior change communication messages" to promote health. Another key aspect of the course is to learn the art of health advocacy and mediation to promote health. During that process, students will be acquainted with key principles of advocacy while addressing the complex social and environmental determinants of health in resource-constrained settings.

HSYS-7002-A029/ HSYS-7011-A030

| **3.0** | **Dr Fareeha Sheikh**
Reproductive Health: Policy & Programme Management

This course introduces the basic principles of developing and managing reproductive health (RH) programs in LMICs. The course will inform students about; a shift in conceptual approach from MCH to RH, the unfinished agenda of RH in LMICs, challenges related to RH policy along with practice gaps, and the integrated versus vertical approach in RH. It will introduce the essential components of an RH program and equip students with skills to assess the district RH profile and develop a district RH program comprising of service package; medicines, supplies, and logistics; workforce; financial and management plans; key performance indicators and Monitoring and Evaluation (M&E) framework. Strategies that can be used to address challenges and enhance the pace of progress to achieve RH targets will also be presented, including integration of RH with health, community involvement to strengthen RH programs, and mainstreaming of gender in RH programs.

HSYS-7005-A029

| 3.0 | Dr Shifa Habib

Public Health Law & Ethics

This course focuses on the concepts of rights, ethics and equity and how these concepts relate to public health law. The three concepts are to be understood in relation to each other, and in the context of health and well-being, as well as laws regulating public health. The students will engage in the study of law as a tool for promoting population health and well-being at international and national levels. The course explores the processes of legislation, regulation and implementation of laws related to public health at various levels of the State. The roles of various stakeholders involved in influencing and implementing public health legislation and regulations will be extensively explored through case studies and examples.

EPBR-7011-A005/ MPHR-7002-A030/ EPID-9007-A008

| 3.0 | Dr Muslima Ejaz

Principles of Epidemiology & Research Ethics (POERE)

The purpose of this course is to introduce the core concepts, principles, methods, and practical approaches of epidemiology and provide a basic understanding of biomedical research ethics including both clinical and community-based research ethics. The course will enable students to recognize the use of epidemiology as a research tool to address a health problem and to provide sound evidence for improving the health of the population and healthcare practices. The course is structured around four main areas: principles and methods of epidemiology; epidemiologic approach to address health problems; application of epidemiology to improve public health and clinical practice; and ethical principles and their applications in research practice. The assessment for this course involves homework assignments, quizzes, mid-course assignments, presentations on ethical issues, and end-of-course assignments on epidemiology and ethics

MGMT-7002-A029

| 3.0 | Ms Nousheen Pradhan

Strategic Planning

Strategic planning is creating a vision for the future and managing progress towards planned outcomes. It is an effective management process that bridges the gap between long-term vision and day-to-day tactical decisions at the organization/ program level. Students will be trained in developing vision, mission statements, goals, and strategic objectives and articulate a clear planning process by developing logical framework. Furthermore, they will learn skills to undertake situation analysis, priority setting, costing and developing monitoring & evaluation frameworks for a district or an organization. Throughout the course, particular emphasis will be placed on the importance of strategic planning in an ever-changing healthcare environment.

HSYS-7006-A029

| 3.0 | Dr Maryam Huda

Economic Evaluation: Theory & Practice

This course is designed to give students a solid background in health economic principles and their application in the field of health and medicine for decision-making purposes. Decision-making is a crucial element in the field of medicine and resource allocation is at the heart of decision-making in the health care sector. Health policymakers and health insurers have to decide what to promote, what to discourage, and what to pay for. Together, these decisions determine the quality of health care that is provided in a resource constraint environment. Economic evaluation is an approach used to support decision-makers in allocating resources by providing tools to compare the costs and benefits associated with multiple alternative scenarios or interventions. This course introduces the basic principles of economic evaluation as applied to healthcare interventions, the different types that are available and the various stages and techniques that need to be applied to generate results.

HSYS-7009-A005/ SYS-7011-A029/ HSYS-7002-A030/

HSYS-9012-A008 | 3.0 | Dr Imran Naeem

Public Health: Principles, Surveillance & Socioeconomic Determinants

This course helps students to appreciate/recognize the relationship between public health on one hand, and socioeconomic determinants of health on the other. The purpose of the course is to introduce the principles, core concepts and practical approaches used in public health. The course is structured around three main areas: public health problems, health determinants and health systems and provides students with an insight into social and economic factors that affect health at downstream to upstream levels and inequalities in health. It would also focus on essential public health functions including public health surveillance of both infectious and non-infectious diseases, and emergency preparedness. Students are required to work on a case study which includes the burden of the problem and associated risk factors and the identification of options and interventions. Student work in groups and make presentations. They also submit a term paper individually.

EPID-7014-A005

| 3.0 | Dr Zafar A. Fatmi, Dr Bilal A. Usmani, Dr Imran Nisar

Infectious Diseases & Environmental Epidemiology

The course will address dual themes “Environmental Epidemiology and Infectious Diseases”. It will draw on examples of common environmental and occupational health concerns and infectious diseases of developing and developed countries that have impacts from the local to the global geographies. The focus will be on chemical, physical and biological (infectious) agents in air, water and soil affecting human health. The student would understand the importance, centrality, and quality of exposure assessment methods for environmental epidemiological studies. They will understand the methods, tools, and analysis for investigation of the geographical occurrence of disease, hazard surveillance and risk assessment. Students will be taught case studies that will focus on specific disease syndromes such as acute respiratory infections, diarrheal diseases, hepatitis, HIV, tuberculosis, sexually transmitted diseases, malaria, and other

HSYS-7005-A030/ EPBR-7014-A005/ EPBR-9014-A005

| 3.0 | Dr Shafquat Rozi

Design of Experiments & Regression Methods-I

This course is designed to enable students to critically analyse the theories, concepts, and practices in quantitative research. It includes the application of non-parametric tests for more than two independent samples, one factor and two factors ANOVA, repeated measures ANOVA, introduction to the linear & logistic regression models, estimation and interpretation of regression coefficients, testing for the significance of the coefficients, model building strategies and assessment of model adequacy. Statistical packages STATA will be used for data analysis. The students will be able to apply one factor, two factors ANOVA (with and without replications), Randomized Block Designs and repeated measures ANOVA and their non-parametric counterparts. Construct appropriate linear & logistic regression models to data from epidemiological studies using STATA software, interpretation and hypothesis testing of regression coefficients in the model and evaluate the fit of the regression model. Assessment will be through home assignments, project proposal & presentation, quizzes and mid & end of semester examination.

vector-borne diseases of relevance to developing countries. Methods for infectious disease epidemiology will include definitions and nomenclature, outbreak investigations, disease surveillance, correlation of study design with the research question (landmark case-control and cohort studies on infectious disease epidemiology), laboratory diagnosis, molecular epidemiology, dynamics of transmission, and assessment of vaccine effectiveness. The course will also introduce the quantitative behaviour of infectious disease transmission and lay a foundation for a basic understanding of model parameterization. The interaction between population demographic, social behaviour characteristics and pathogen characteristics will be explored using mathematical modelling. We will also cover aspects of these interactions which lead up to an epidemic or pandemic.

EPBR-7015-A005

| **3.0** | **Mr Syed Iqbal Azam**

Multivariate Analysis and Regression Methods II

This is the third Biostatistics course designed for the students in the MSc. program in Epidemiology & Biostatistics. This may also be useful to those faculty and staff who are involved in advanced quantitative research. The main objective of the course is to introduce important bio-statistical concepts and methods in the analysis of time-to-event data (Survival Time) both parametric and semi-parametric regression methods. In addition, an extension of the logistic regression technique for different epidemiological study designs and for multinomial and ordinal outcomes. Poisson & negative binomial regressions, multilevel modelling, multivariate analysis (factor analysis) and introduction to Bayesian Analysis will also be introduced. Emphasis will be on the applications of these methods in medical science research. Statistical package STATA will be used for data analysis.

HSYS-7008-A030/ EPBR-7013-A005/ EPBR-9013-A005

| **3.0** | **Dr Fareeha Shaikh**

Demography & Reproductive Health Epidemiology

The course will familiarize students with basic demographic analyses using various techniques and ensure their comparability across populations. The student will be able to produce population projections and interpret information gathered by using different demographic methods. The course will help students to conduct effective research for providing evidence in the field of reproductive health using a mix of demographic and epidemiological techniques. The course intends to cover the following main areas: the concept of demography, and its measures and theories of demographic transition; the impact of population growth on the environment and health of developing countries; different analytical techniques to interpret

EPID-7006-A005

| **3.0** | **Dr Rozina Nuruddin**

Advanced Epidemiology

Advanced Epidemiology is a mandatory course for the students enrolled in the Master of Science, Epidemiology & Biostatistics program. It aims to provide a firm conceptual grounding in epidemiological principles by extending students' theoretical knowledge of epidemiology beyond basic principles. The course covers a wide range of methodological issues intended to broaden and extend students' understanding of causal inference in epidemiologic research, measures of occurrence and effect, the concept of interaction and elements of study design with specific emphasis on bias and confounding. Fundamentals of data analysis will be discussed with reference to categorical, stratified and polytomous outcome analysis. Application of epidemiological methods will be discussed in special circumstances such in the area of genetics, while using secondary data and in field. The course is expected to serve as a foundation for epidemiologic methods critical for the successful conduct and interpretation of epidemiologic research.

demographic and RH-related data; different indicators to assess the accuracy of demographic data with particular emphasis on age heaping and its applicability in reproductive health studies; basic principles and current challenges of reproductive health in the global and regional context; basic and specialized reproductive epidemiology methods for reproductive health research and translational research conducted in the area of reproductive health. The assessment for this course involves homework assignments, quizzes, technical briefs, and mid and end-of-course assignments.

HSYS-7011-A005/ MPHR-7006-A030

| 3.0 | Prof. Rashid Jooma, Dr Nadeem Ullah Khan
Research in Injury Prevention & Control

Injuries contribute to 4.5 million deaths attributing to 8% of the global death burden. Moreover, 973 million people suffer injuries that require medical attention. About 90% of injury deaths occur in low- and middle-income countries (LMICs). In Pakistan, road traffic injuries are the sixth most common cause of death. There are gaps in addressing the burden and consequences of injuries in Pakistan as well as in other LMICs. The gaps include limited trained human resources, few formal training programs and courses, and scarce national data on individuals, households, socioeconomic welfare, and society. This course would be an academic effort to fill in training needs.

HSYS-7012-A005/ MPHR-7007-A030

| 3.0 | Dr Nargis Asad
Research in Mental Health

Mental disorders impose a significant burden on public health and are among the leading causes of disability worldwide. Research on Mental Health focuses on tools of epidemiology and biostatistics to understand the occurrence and distribution of mental and behavioural disorders across people, space, and time, and investigate the causes and consequences of these disorders in order to develop more effective intervention strategies to treat and prevent them and to promote mental and behavioural health. Mental & Behavioural Health Epidemiology review descriptive and analytic epidemiology for major mental disorders. This course covers a broad range of topics within the mental and behavioural health field combined with a focus on developing research skills in this field.

EPBR-7010-A005 | 3.0 | Mr Syed Iqbal Azam **Data Management & Scientific Writing for Publications**

The course is designed for graduate & post-graduate students. It will address the methodology designed or adapted for the execution of data collection (paper-based or paper-less) & management using computer software like EPIDATA, STATA etc. The course will also help to develop presentation skills using thesis-related research papers and facilitate in preparation of research manuscripts for publication in peer-reviewed local and international journals.

MPHR-7003-A030 | 3.0 | To be confirmed **Behavioural and Social Science Approach in Public Health**

This course has been designed keeping in view of various behavioural and social science disciplines in improving population health with special attention to approaches which influence health behaviour, health policies, lead community participation, and empowerment. Moreover, this course will provide an overview of the social and behavioural sciences and public health, with specific emphasis on the ecological model of community health problem analysis and the development of effective interventions. The course includes selected social and behavioural theories and models used by public health professionals to plan, implement, and evaluate program strategies and policies for the improvement of community health. The assessment of this course involves home assignments, presentations, and mid & end of semester examinations.

HSYS-7006-A030 | 3.0 | Dr Zafar Fatimi
Environment & Climate Change

This course is an overview of the principles of environmental health. The course is intended to develop an understanding of environmental hazards, their effects on health, and various approaches to address these problems. Areas of emphasis are chemical, physical and infectious agents in air, water and soil affecting human health, methodological issues in environmental epidemiology, and global warming and climate change. The students will understand the methods, tools and analysis (time series analysis) for investigation of the geographical occurrence of disease, hazard surveillance and risk assessment. Climate change is considered one of the biggest present and future threats to humankind. It may affect human health through several known direct and indirect pathways and may also influence human health through several unknown pathways. Climate Change also influences and disrupts the social and environmental determinants and has consequences on human health. It can affect the availability of clean air, safe drinking water and sufficient food and can destroy shelter. The course provides practical solutions and interventions (the plan of action) at national, provincial and district level and state levels to reduce the harm caused by climate change. The assessment of this course involves home assignments, seminars on climate change and its impact on health, quizzes, and mid & end semester examinations.

EPID-7016-A005 | 3.0 | Dr Romaina Iqbal
Nutrition & Non-Communicable Diseases Epidemiology

The lives of many individuals across the globe are being affected adversely by non-communicable diseases (NCDs) such as diabetes, heart disease, and stroke. NCDs are no longer restricted to the high-income countries, four out of five deaths due to NCDs today are occurring in middle and low-income countries. People in these countries develop the disease at younger ages, suffer for a longer period- often with modifiable risk factors and preventable complications- and tend to die earlier than individuals from high-income countries. Whereas, the dual burden of over and undernutrition is also prevalent globally. Estimates suggest almost 54% of under 5 children mortality in developing countries can be linked to malnutrition. In this course, the students are introduced to the key concepts and epidemiology of NCDs and Nutrition with special reference to developing countries in general, and Pakistan in particular. The relationship and application of epidemiology in addressing various NCD and nutrition-related public health issues are stressed by sharing research conducted in Pakistan. The epidemiological evidence on nutrition and common NCD risk factors unique to the Pakistani population, and methods for carrying out research in these areas will be discussed. Students will be taught various parameters used in the assessment of a community's nutritional status. The benefits and pitfalls of key nutrition assessment tools for assessing a community's nutritional status will be discussed in detail. Conventional versus latest techniques for assessment of nutritional status at the population level will be covered. Current nutrition issues of relevance for Pakistan and the region shall also be discussed in detail. Assessment would be based on written assignments and class presentations.

HSYS-7004-A030 | 3.0 | Dr Romaina Iqbal
Public Health Nutrition

Low-Middle Income Countries (LMICs) is simultaneously experiencing a double burden of diseases attributed to malnutrition. About 85% of premature deaths occur in LMICs due to nutrition-related Non-Communicable Diseases (NCDs), while Poor nutrition cause nearly half of deaths in children under five. This double burden of malnutrition requires integrated action on malnutrition to achieving the Sustainable Development Goals. For this purpose, integrated knowledge of public health and nutrition sciences as a multi-disciplinary approach is needed. Inadequate local evidence relating to diet, nutrition, and disease outcomes constrains the accurate identification of the problem and policy interventions to tackle the rising burden of under and over-nutrition and chronic disease burdens. Public Health Nutrition (PHN) is an educational discipline that can train candidates to address the alarming rise in malnutrition-related diseases and work in sync with other stakeholders towards ensuring better health for the masses. Public health nutrition as a subject is growing immensely in importance, considering the real potential to reduce the burden of malnutrition & diet related chronic disease. This module will describe the current issues and concepts of public health nutrition. The Public Health Nutrition course will enable students to understand the art and science of public health promotion and prevention via sustainable improvement in nutritional status by developing, managing, and evaluating community-based nutrition and food policy programs. This course combines public, and population health approach with a sound understanding of the science of nutrition. The course includes interactive sessions along with a variety of active learning strategies, including group projects/presentations Journal Clubs and field visit. Assessment will be through assignments, quizzes, project proposal writing and class presentation.

HSYS-7012-A030 | 3.0 | To be confirmed
Global Health

This course is planned to familiarize students with global health concepts and evolution with an understanding and analysis of policies and practices of global health. This course will provide a broader understanding of different expressions of global health policy discourse, intricacies of the policy process, actors and institutions involved and its political economy. The course will further highlight the global health issues of communicable and non-communicable diseases, pandemics, epidemics and various programs from a global perspective along with the desired and actual impact with a special focus on the low- and middle-income countries. The course will also focus on the various stakeholders involved and their power structures, political and other influential players, decision-making process and the external factors involved in global agenda setting. Sessions on technological advancements and innovations in global health will help develop an understanding of the factors influencing their success and failure. Global Health course is also aimed at developing an understanding of the relation between health and sustainable development goals and overall human and social development and how it can be measured and ensured. The aspect of climate change and its impact on global health will also be covered. Student learning and analytical understanding will be consolidated with case studies as well as specific readings on different topics through selected texts. The assessment of this course entails class participation, group presentations, reflective essays and a final project report.

Course Description

Department for Education Development (DED)

Courses in the catalogue are subject to changes and availability. Students are advised to contact program directors for details.

HPED-7002-A017 | 4.0 | Dr Naveed Yousuf, Dr Qamar Riaz **Curriculum Development in Health Professions Education**

ALC-CD in HPE enables students to understand the curricular evolution in HPE and to participate in a step-by-step development of a competency-based innovative curriculum according to the guiding principles. Students have to take into account organizational, social and political factors, utilizing those that may facilitate and overcoming those that may hinder their curriculum planning.

HPED-7004-A017 | 3.0 | Dr M. Tariq, Dr Shazia Babar **Programme Evaluation in Health Professions Education**

This course focuses on the diverse purposes, uses, types, approaches, recent developments, evaluation designs and guidelines for planning, conducting and using programme evaluations for planning and implementation. By the end of this course, students will be able to analyze and use different evaluation approach(es) for effective evaluation of educational programmes, based on the purpose of evaluation. They will develop a plan for programme evaluation of a competency-based curriculum, identifying evaluation trends, developing efficient teamwork, and taking care of the various pitfalls and ethical dilemmas in evaluation.

HPED-7010-A017 | 4.0 | Dr S. Kauser Ali, Dr Naveed Yousuf **Quantitative Research Methodologies in Health Professions Education**

By the end of this course, students will be able to develop educational research proposals using the standard research framework ensuring all anticipated ethical issues are addressed and intellectual/academic rigor is maintained, avoiding plagiarism and using endnote referencing. The students will also be required to identify a researchable problem relevant to quantitative research in HPE, critically appraise and use relevant current literature, frame appropriate research questions, objectives and hypotheses; identify, select and justify the use of appropriate study designs and methods for data collection, data analysis to answer the research question(s) and data presentation.

HPED-7011-A017 | 3.0 | Dr Tazeen S. Ali, Dr S. Kauser Ali **Qualitative Research Methodologies in Health Professions Education**

In this course, the students will be able to identify a researchable problem appropriate for qualitative research in HPE, critically appraise and use relevant literature, frame appropriate research questions and objectives; identify, select and justify the use of appropriate research approaches, and appropriate methods for data collection, management and analyses. The students will also be required to address anticipated ethical issues and develop a rigorous educational research proposal using the standard research framework.

HPED-7020-A017 | 4.0 | Dr Amber Sultan
Issues in Health Professions Education

By the end of the course, the participants will be able to identify and prioritise issues related to students, faculty or mismatch of curricula and services, in undergraduate, postgraduate and continuing health professionals education, identifying their relationships with geopolitical, socioeconomic factors or other factors. Students will identify at least one issue, critically appraise current literature, and propose a solution(s) with justification, keeping in focus the responsibilities of accreditation bodies, medical colleges and universities.

HPED-7005-A017 | 4.0 | Dr Tabassum Zehra, Dr Naveed Yousuf
Leadership in Health Professions Education

This course enables the students to develop a strategic plan for an educational programme and/or leadership challenge at the programmatic or organizational level. They will critically analyze the different leadership theories, approaches and frames based on the strengths and limitations of each; and align the different leadership approaches to the different leadership frames. They will also apply strategic planning, the frames, leadership theories, approaches and the best current literature collectively to identify solutions and a plan of action for an important leadership challenge in their own course or academic programme at their own institution.

HPED-7016-A017 | 3.0 | Dr Azam Afzal, Dr Shanila Sohail
Teaching & Learning I in Health Professions Education

In this course, students will be able to design teaching and learning sessions and programmes in HPE with a thorough grounding in the current theories of learning. Students will be able to evaluate the effectiveness of the various small and large group teaching strategies and conduct teaching sessions based on the principles of learning and learning theories. They will also learn how to contribute to building a conducive learning environment at their own institution(s), develop/enhance their reflection ability, and use information and communications technology to enhance learning.

HPED-7017-A017 | 3.0 | Dr Rahila Ali, Dr Shanila Sohail
Teaching & Learning II in Health Professions Education

By the end of this course, students will be able to teach critical thinking and decision-making skills in clinical teaching; develop and use appropriate instructional material and resources; develop appropriate student support systems, and critically evaluate models of faculty evaluation in the light of scholarship of teaching and learning frameworks, and will be able to use Technology for enhancing learning and develop a teaching portfolio.

ELEC-7004-A017 | 3.0 | Dr Rahila Ali
Cognitive Psychology | Dr Javeria Rehman

The course focuses on cognitive processes underlying the mind and behaviour. The aim of this course is to support educators in facilitating learning by developing metacognitive abilities among their students, cultivating innovative and interactive teaching/learning environments, and gaining awareness of the influence of their own behaviour on learning.

HPED-7018-A017 | 4.0 | Dr Shazia Babar, Dr Sana Saeed
Assessment I in Health Professions Education

This is the basic assessment course that imparts practical assessment planning and innovative assessment methods which lead to enhanced student learning and institutional accountability. The course focuses on assessment methods (how to) and critical appraisal of current best practices appropriate for assessing each curricular competency, with a focus on assessment of critical thinking, clinical reasoning and performance. It highlights the importance of assessment for learning and assessment of learning, with an introduction to the basis of psychometrics.

HPED-7019-A017 | 4.0 | Dr Naveed Yousuf, Dr Sana Saeed
Assessment II in Health Professions Education

The course focuses on the purpose, design, implementation and evaluation of rigorous, robust and fit-for-purpose assessment with a focus on designing a valid and reliable assessment tool relevant to HPE, with emphasis on the participant's involvement within the context of their own profession and institution. The intensive interactive teaching and learning component will focus on test and measurement, and the psychometric properties of tools.

Academic Calendar 2023

SONAM (UG, GRD, PhD); MC (ASDH, GRD, PhD); IED (GRD, PhD)

Spring Semester		Study Break / Summer Semester	
Semester Start	Feb 6	Semester or Study Break Start	Jun 12
Pakistan Day	Mar 23	Eid-ul-Adha	Jun 29 - Jul 1
Ramadan Begins	Mar 23	Ashura-e-Moharram	Jul 31 - Aug 1
Eid-ul-Fitr	April 21 - 23	Semester End	Aug 4
Labour Day	May 1	Exam & Grading (Summer Session)	Aug 7 - 11
Semester End	May 27	Independence Day	Aug 14
Examination	May 29 - Jun 2	End of Study Break	Sep 3
Grading and Progression Review	Jun 5 - Jun 17		
Fall Semester			
Semester Start	Sep 4	Grading & Progression Review	Jan 1 - 12, 2024
Defense Day	Sep 6	Grading of Graduating Class to RWG	Jan 19, 2024
Eid Milad-un-Nabi	Sep 28	Academic Council	TBD
Iqbal Day	Nov 9	Convocation	TBD
Semester End	Dec 22		
Quaid-e-Azam Birthday / Christmas	Dec 25		
Examination	Dec 26 - 29		

Academic Calendar 2024

SONAM (UG, GRD, PhD); MC (ASDH, GRD, PhD); IED (GRD, PhD), FAS (UG)

Spring Semester	
Semester Start	Feb 6 [#]
Examination	May 27 - 31
Semester End	May 31
Grading and Progression Review	Jun 3 - Jun 14

Summer Semester	
Semester Start	Jun 10
Examination	Aug 5 - 9
Semester End	Aug 9
Grading and Progression Review	Aug 12 - 16

Fall Semester	
Semester Start	Sep 2
Examination	Dec 23 - 27
Semester End	Dec 27
Thesis examination and oral defense and viva to be completed by	Dec 27
Grading and Progression Review	Dec 30, '24 - Jan 16, '25
Grading to RWG (Graduating Class)	Jan 17, 2025

Important Dates and Vacations	
Ramadan Begins *	Mar 12
Pakistan Day	Mar 23
Eid-ul-Fitr *	Apr 11 - 13
Labour Day	May 1
Eid-ul-Adha *	Jun 17 - 19
Ashura-e-Moharram *	Jul 16 - 17
Defense Day	Sep 6
Eid Milad-un-Nabi *	Sep 16
Iqbal Day	Nov 9
Quaid-e-Azam Birthday / Christmas	Dec 25

NOTES:

- Students not enrolled in Summer Semester will have vacations from June 3 till September 1, 2024.
- IED, Pakistan Birdging Programme will follow Fall 2024 Semester date.
- All academic activities including oral defence and viva to be completed within semester timelines.

* Subject to the sighting of moon

Monday Feb 5, 2024 is a public holiday (Kashmir Day) therefore semester will commence from Tuesday, Feb 6, 2024.



Links to Important Information

It is the responsibility of the students to make themselves aware of the available resources, rules and regulations of the university.

Admission information for all programmes

<https://www.aku.edu/admissions/Pages/graduate.aspx>

Graduate and PhD Programmes Admission Process Summary

<https://www.aku.edu/admissions/Documents/admission-process-summary.pdf>

Financial Assistance

www.aku.edu/admissions/fees-and-funding

Student Accommodation

<https://www.aku.edu/students/Pages/accommodation-pk.aspx>

Degree Requirements

<https://www.aku.edu/mcpk/graduate/Pages/home.aspx>

General Guidelines for PhD and Master's Theses/Dissertations

<https://www.aku.edu/admissions/documents/policy-phd-master-theses-011.pdf>

Ethics Review Committee (ERC) Home Page

<https://www.aku.edu/mcpk/research/Pages/ethical-review.aspx>

ERC User Manual

<https://www.aku.edu/mcpk/research/Documents/ERC%20Application%20User%20Manual%20Sep-2019.pdf>

Grading System and Academic Standards

<https://www.aku.edu/admissions/Documents/policy-graduate-programme-grading-001.pdf>

Student Code of Conduct and Disciplinary Procedures

<https://www.aku.edu/admissions/Documents/policy-code-of-conduct-009.pdf>

Student Academic Integrity Policy

https://www.aku.edu/mcea/medicine/Documents/017_Student%20Academic%20Integrity%20Policy.pdf

Student Anti-Harassment Policy

<https://www.aku.edu/admissions/Documents/policy-anti-harassment-028.pdf>

Policy on Repeating a Course for which a Passing Grade has been Awarded

<https://www.aku.edu/admissions/Documents/policy-repeating-course-033.pdf>

ERC Frequently Asked Questions

<https://www.aku.edu/mcpk/research/Documents/FAQs%20-%20ERM%20Sep-2019.PDF>

University Policy on Research Misconduct

<https://www.aku.edu/mcpk/research/Documents/FAQs%20-%20ERM%20Sep-2019.PDF>

Academic Accommodation for Students with Disabilities

<https://www.aku.edu/admissions/documents/policy-academic-accommodation-035.pdf>

Academic Progression Policy

<https://www.aku.edu/admissions/documents/policy-academic-progression-041.pdf>

Other AKU Policies

<https://www.aku.edu/registrar/Pages/policies.aspx>

Prof. M. Shahid Shamim

Director of Graduate Studies

Aga Khan University – Medical College

dgs@aku.edu