



UNDERGRADUATE PROGRAMS

ALLIED HEALTH SCIENCES CURRICULA 2024





GOVERNOR



Effective healthcare services are the backbone of a society. Allied Health Sciences are integral to an effective healthcare landscape of a country. To potentiate the training and education of the Allied Health Sciences is a visionary step. The efforts made by the University of Health Sciences (UHS), Lahore, to revamp the curricula of Allied Health Sciences and Nursing is praiseworthy. The new curricula would provide the students an engaging educational environment that is intended to encourage and empower them to become competent, sympathetic, and patient-centered healthcare professionals. These curricula will allow the university to produce graduates well- adapted with the recent global advancements in healthcare technology.

My personal vision for the affective development of healthcare professionals is well addressed in the current curriculum. The additional training of skills related to Professionalism, Ethics, Research and Leadership will equip the graduates to prove their mark in the global health forums.

I congratulate University of Health Sciences to put in the work to develop curricula which are contextualized with local practices and aligned with international standards by incorporating the existing educational and societal needs. The development of these curricula is the testament to the educational standards that UHS strives for by improving the learning experience of students based on constant innovation and excellence. Allied health professionals and Nurses hold an integral position in the healthcare industry, so I believe that these newly introduced curricula will contribute in producing graduates having not only the required professional expertise but also the ethics and moral values needed to become a useful member of the society.

Muhammad Baligh-ur-Rehman
Governor
Government of Punjab, Pakistan



CHIEF MINISTER

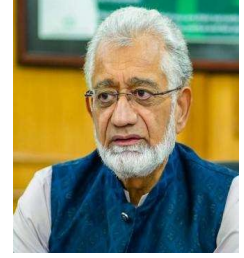
It gives me great pleasure to acknowledge the efforts of University of Health Sciences, Lahore in launching the updated curricula for Allied Health Sciences and Nursing students, in order to equip them with the global best practices in the field. The new curricula would, no doubt, enable our students acquire latest skill set, professionalism, ethics, research and leadership, needed for materializing my vision of their greater global recognition and better international employability.

Allied Health Professionals and Nurses work in unison to support the integrated healthcare system. With the upkeep of their curricula, University of Health Sciences has made a commendable contribution in equipping them with the cutting-edge knowledge, tools and techniques being employed internationally for better service delivery in the healthcare sector. It also goes without saying that the incorporation of global educational standards in curricula would enable the students learn soft skills like good manners and social etiquettes, which will maximize their professional success.

Moreover, in order to ensure their better global acceptability, I would urge upon our graduates to be more proficient in English and Arabic Languages because better proficiency in these languages can further enhance their employment opportunities internationally, especially in the services and research sectors.

I appreciate the efforts of University of Health Sciences in devising a state of the art curricula for its students in the field of Allied Health Sciences and Nursing, and assure the faculty of Allied Health Sciences and Nursing of the University of Health Sciences of our full support and backing in getting this new curricula implemented.

Syed Mohsin Raza Naqvi
Chief Minister
Government of Punjab, Pakistan



HEALTH MINISTER

University of Health Sciences Lahore, being a lead health science university in Punjab, consistently evolves its educational standards to keep them aligned with the global and national requirements for producing best graduates. Revamped Allied Health Science and Nursing curricula are the latest examples of this tradition. These curricula have been prepared to enrich the educational knowledge and expertise of the students and to prepare them to excel in the field of Allied Health Sciences and Nursing for building a healthier and promising future for our society.

I believe that by adopting the new curricula, the university will produce allied health professionals and nurses who can deliver improved health services that are required for bringing health-sector reforms. The strength of a curricular document depends on the joint efforts of the educators and the students, so I am confident that the educational efforts made by UHS in designing these curricula will prepare our young graduates for all the future global challenges. I also believe that this will foster them to come forth with the aim of improving the quality of human life.

Prof. Dr. Javed Akram
Health Minister
Government of Punjab, Pakistan



HEALTH SECRETARY

I find it very satisfying that these revamped curricula of Allied Health Sciences and Nursing prepared by UHS are detailed and carefully drafted documents with inputs from key stakeholders. Specialized Health Care & Medical Education Department encourages the innovative and revolutionary efforts taken by the university in enhancing the quality of healthcare education to produce qualified professionals. These curricula will enable the students to have an understanding of the recent advancements in healthcare industry, which will empower them to develop creative ideas for the progress of the wider healthcare sector. Allied health sciences and Nursing are the backbone of the healthcare system and these curricula certainly have a strong potential to produce professionals committed to better health and wellbeing of the public. The additional focus towards professionalism, ethics, research, communication and leadership will ensure the production of professionals that are needed for an advanced and refined society. My best wishes are with the University of Health Sciences in implementing these curricula for achieving the desired goals.

Ali Jan Khan
Secretary, Specialized Healthcare & Medical Education
Government of Punjab, Pakistan



VICE CHANCELLOR

I am thankful to **Allah** for being able to develop a structured, revamped, set of curricula for all the allied health disciplines being governed by the University of Health Sciences Lahore. The revamping process was the need of the time and its development was carried out in a truly contextualized manner with a broad-based intellectual influx by the leaders of the discipline.

The prospects of allied health sciences are promising at a global level and are influenced by various factors, including advancements in healthcare technology and changes in healthcare delivery models.

The revolutionary changes in the healthcare landscape of our country and the global outreach that we are striving for requires an enhanced role of the Allied health professionals with ever evolving roles and integral positions in the healthcare industry. With an increasing focus on preventive healthcare and interdisciplinary care models, in the ages ahead of AI and digital world the opportunities for allied health professionals require more diverse responsibilities, collaboration with other healthcare providers, and contribution to a comprehensive patient care.

Our curricula and the commencement of the Semester based educational system will ensure global employability for our students in the near future In sha Allah.

Prof Ahsan Waheed Rathore
Vice Chancellor
University of Health Sciences Lahore



PRO VICE CHANCELLOR

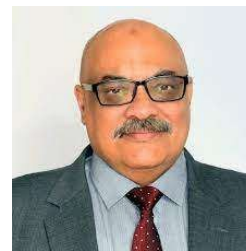


University of Health Sciences envisions a standardized, structured, globally accredited quality education for all its students in all its affiliated institutes. Allied Health Sciences being one of the integral facets of the healthcare education remains a vital dimension of our institutional ideology. Current transition to the semester system and the revamping of the Allied Health Sciences curriculum reflects a visionary commitment to adaptability and excellence in healthcare education. Emphasizing the need for innovation and relevance in the constantly evolving field of allied health sciences, the University remains dedicated to preparing students for the dynamic challenges of modern healthcare. The revamped curricula integrate the cutting-edge technologies, interdisciplinary approaches, and industry-relevant skills within the curriculum to ensure that graduates are well-equipped to contribute meaningfully to the healthcare sector. This initiative not only aligns with the university's mission to foster academic excellence but also serves as a testament to its forward-thinking approach to shaping the future healthcare workforce. The novel additions of Professionalism, Ethics, Research, Leadership and English skills will hopefully inspire a sense of purpose and relevance among students and faculty, encouraging them to actively participate in the transformation of allied health sciences education based on a semester system.

Prof Nadia Naseem
Pro-Vice Chancellor
University of Health Sciences Lahore



DIRECTOR MEDICAL EDUCATION DEPARTMENT



Allied Health Sciences forms a strong backdrop to healthcare systems globally. University of Health Sciences has been governing and monitoring the Allied Health Sciences programs across the province. The University being cognizant with the ever-evolving need of the curricular evaluation and need to address the emerging content for the different disciplines undertook an initiative for the revamp of the curricula of Allied Health Sciences. Current volume has nine revamped curricula which have been developed methodically in accordance with the standards defined by the national regulatory authority 'Higher Education Commission'. Keeping the global in vogue educational practices as a benchmark, the university is transitioning to a semester-based system for all Allied Health Sciences undergraduate programs. The approach to curriculum development was methodical and contextualized. Healthcare leaders from all the respective disciplines were identified and onboarded for the defining the required content, identifying the ratio of knowledge and skills, and formulating outcomes for the programs. The identified healthcare leaders were provided a platform by constituting the respective Subject Advisor Committees. All the elements of course design ranging from content, modes of information transfer, assessment methodology, table of specification and outcomes were aligned by the subject experts. The University took a parallel initiative of stakeholder input by corresponding with all the affiliated colleges for any input, amendment, or addition they may require at this juncture of curriculum development. The feedback and suggestions from these affiliated institutions was incorporated in the revamping process. Finally, the revamped curricula was subjected to an evaluation by another set of subject experts before being approved by the statutory process of the University of Health Sciences. The meticulous effort, stakeholder inclusion, leadership insights, and diverse inputs, has made it possible to come up with a claim of curricula which are structured, fully contextualized, of international caliber, and hold a potential of global employability for the students. To further ensure global employability and international accreditations

the University of Health Sciences under the directive of the worthy Vice Chancellor has commenced English proficiency and affective domain training modules for the students. These curricula will yield the required results as intended by the collaborative efforts of the Department of Medical Education, Department of Allied Health Sciences, focal persons from UHS, subject experts from our advisory committees and the faculties of the affiliated colleges, In sha Allah. Curricula are live documents. They can and should be kept alive by constant positive feedback and updating, by all stakeholders. So, keep collaborating and working for a joint cause for our 'Allied Health Professionals' of tomorrow.

Lt. Col. (R) Dr. Khalid Rahim Khan, TI(M)
Director, Medical Education Department
University of Health Sciences Lahore



DIRECTOR



INSTITUTE OF ALLIED HEALTH SCIENCES

Since its establishment in 2002, UHS is dedicated to produce world-class Allied Health Professionals who will uphold and advance globally. The vision is to produce competent skillful healthcare professionals who can contribute and play their best role in healthcare system.

Allied Health Science is without any doubt the backbone of the healthcare industry of any country. It is the well-formed and sound knowledge of medicine that makes any community healthier and allows for the growth of a nation. The purpose of Institute of Allied Health Sciences is to provide a strong foundation to Allied health professionals in the skills required to support the health care team in diagnosing, managing and rehabilitating patients. We commit to our standards which ensure that our graduates are morally upright and ready to serve the humanity with sheer commitment and responsible conduct.

We at UHS, are committed to creating an environment that fosters student leadership through innovative and proven teaching methods. We have always followed a multidisciplinary approach based on market trends, technologies, corporate ethics and core values that contribute to the all-round development of a student. We pledge to promote medical education via innovation by integrating social responsibility, research, and education to prepare our students for leadership roles in the world of health. We are all excited to start this academic year filled with some stimulating new challenges and opportunities. To empower our students so that they can reach their potential and achieve their academic, as well as their social, emotional, and physical development targets, UHS has designed the new Semester-based Curriculum adhering to the needs of this ever-changing global world.

The new semester system will allow more learning and greater engagement with and reflection on the subject matter. A stronger core curriculum will impart fundamental

competencies. There is also a greater emphasis on interdisciplinary and applied learning, including a final-year honours Capstone project to solve problems drawn from real clinical settings and scenarios.

Dr. Saba Khaliq
Director, Institute of Allied Health Sciences
University of Health Sciences Lahore

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PREAMBLE

University of Health Sciences (UHS), Lahore is a leading university aiming to keep its graduates apt with the ever-emerging global health challenges, evolving educational methodologies and emerging technological advancements. Established in 2002, UHS has emerged as the foremost health sciences educational institution in Pakistan boasting affiliations with 128 colleges and institutes and a diverse student body including approximately 106,916 undergraduate and 9,157 postgraduate students registered with it. As a visionary force in medical education, UHS regulates and coordinates the activities of medical education, training & research in healthcare throughout the province of Punjab. Allied health are the medical professionals who work to prevent, diagnose and treat diseases and illnesses. They also apply management and administration skills to support health care systems, and apply scientific principles and evidence-based practices to assist patients. The World Health Organization (WHO) estimates there is currently a worldwide shortage of about 2 million allied health professionals (considering all health workers aside from medical and nursing personnel) needed in order to meet global health goals. UHS has initiated a ground breaking paradigm shift to revamp curriculum and assessment of allied health sciences as demanded by the modern health care system. Department of Medical Education has launched a revolutionary initiative involving affiliated institutions of UHS offering Allied Health Sciences degree programs. This initiative aims to revolutionize Allied Health Sciences in Pakistan. The Department of Medical Education serves the purpose of facilitating the transition from offering traditional to modern medical education system. On one hand, curriculum revamp is a national affair, as it is expected to define the knowledge and abilities that are seen to be

most valuable in a society and necessary to prepare the future. On the other hand, it can be influenced by international trends, such as globalization, and international student assessments also reflect this. Curriculum revamp is an intersection between these forces. Curriculum revamp has indeed long been considered from a “top-down” perspective, but has progressively shifted towards a more “bottom-up” approach, emphasizing the central role of teachers in the process.

The Department of Medical Education with the help of UHS Allied Health Sciences faculty and Alumni of UHS working internationally, has carefully redesigned the entire curriculum, fostering inter-professional learning and transitioning Allied Health Sciences degree programs to a uniform semester system in accordance with the guidelines set forth by the Higher Education Commission of Pakistan. After curriculum revamp, courses are ingeniously categorized into three pillars:

1-General Courses providing a foundational understanding of essential technical knowledge.

2-Interdisciplinary courses fostering teamwork and coordination across various Allied Health Science disciplines.

3-Subject-specific courses designed to cultivate expertise in each degree program.

This curriculum revamp involves a change in the learning objectives, specifically determining the competencies, knowledge, values, and attitudes that students should acquire.

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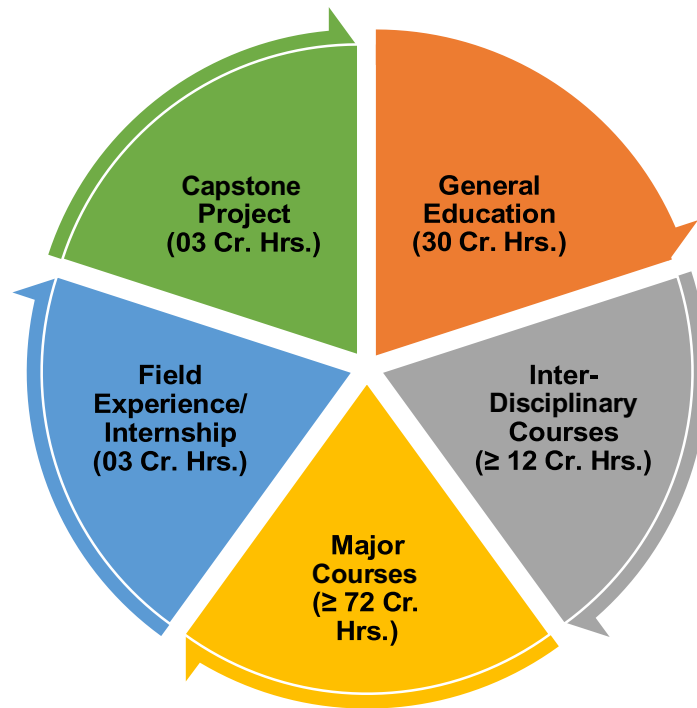
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MODEL SCHEME



Four Years Degree: 120-144 Credit Hours

Five Years Degree: 160-180 Credit Hours

GENERAL COURSES		
COURSE CODE	COURSE TITLE	CREDIT HOURS
GEFE	Functional English	03
GEEW	Expository Writing	03
GEQR-I	Quantitative Reasoning-I	03
GEQR-II	Quantitative Reasoning-II	03
GEICP	Ideology and Constitution of Pakistan	02
GEIS	Islamic Studies	02
GEICT	Applications of Information and Communication Technologies (ICT)	03 (2+1)
GEE	Entrepreneurship	02
GECCM	Civics and Community Engagement	02
GENS	Natural Sciences	03 (2+1)
GEAH	Arts & Humanities	02
GESS	Social Sciences	02
	TOTAL	30
INTERDISCIPLINARY COURSES		
COURSE CODE	COURSE TITLE	CREDIT HOURS
IDBB	Basic Biochemistry	03
IDBA	Basic Anatomy	03
IDBP	Basic Physiology	03
IDGP	General Pathology	03
	TOTAL	12
EPC	ENGLISH PROFICIENCY COURSES	12
PERL	PERLs	08



GENERAL EDUCATION COURSES

FUNCTIONAL ENGLISH

Credit Hours: 03 (03+0)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Apply enhanced English communication skills through effective use of word choices, grammar, and sentence structure.
2. Comprehend a variety of literary / non-literary written and spoken texts in English.
3. Effectively express information, ideas, and opinions in written and spoken English.
4. Recognize inter-cultural variations in the use of English language and to effectively adapt their communication style and content based on diverse cultural and social contexts.

Course Content:	MCQs	SEQs
I. Foundations of Functional English: <ol style="list-style-type: none"> i. Vocabulary building (contextual visage, synonyms, antonyms, and idiomatic expressions). ii. Communicative grammar (subject-verb-agreement, verb tenses, fragments, run-ons, modifiers, articles, word classes, etc.). iii. Word formation (affixation, compounding, clipping, back formation, etc.). iv. Sentence structure (simple, compound, complex and compound-complex). v. Sound production and pronunciation. 	15	03
II. Comprehension and Analysis: <ol style="list-style-type: none"> i. Understanding purpose, audience, and context ii. Contextual interpretation (tones, biases, stereotypes, assumptions, inferences, etc.) iii. Reading strategies (skimming, scanning, SQ4R, critical reading, etc.) iv. Active listening (overcoming listening barriers, focused listening, etc.) 	15	03
III. Effective Communication: <ol style="list-style-type: none"> i. Principles of communication (clarity, coherence, conciseness, courteousness, correctness, etc.) ii. Structuring documents (introduction, body, conclusion, and formatting) iii. Inclusivity in communication (gender-neutral language, stereotypes, cross-cultural communication, etc.) iv. Public speaking (overcoming stage fright, voice modulation and body language) 	15	03

v.	Presentation skills (organization content, visual aids and engaging the audience)		
vi.	Informal communication (small talk, networking, and conversational skills)		
vii.	Professional writing (business e-mails, memos, reports, formal letters, etc.)		

Recommended Books / Reading Materials:

1. "High School English Grammar and Composition" by H. Martin & P.C. Wren.
2. Technical Communication: Principles and Practice (3rd Edition) by Meenakshi Raman and Sangeeta Sharma. Oxford University Press
3. The Art and Science of Business Communication (4th Edition) by P.D Chaturvedi and Mukesh Chaturvedi. Pearson.
4. College Writing Skills with Readings by John Langan (8th Edition) McGraw Hill.
5. Patterns for College Writing: A Rhetorical Reader and Guide (12th edition) by Laurie G. Kirszner and Stephen R. Mandell. Bedford/St. Martin's

Additional Reading:

1. "Understanding and Using English Grammar" by Betty Schramper Azar.
2. "English Grammar in Use" by Raymond Murphy.
3. Style: Lessons in Clarity and Grace by Joseph M. Williams and Joseph Bizup
4. "The Blue Book of Grammar and Punctuation" by Jane Straus.

EXPOSITORY WRITING

Credit Hours: 03 (03+0)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Understand the essentials of the writing process integrating pre-writing, drafting, editing and proof reading to produce well-structured essays.
2. Demonstrate mastery of diverse expository types to address different purposes and audiences.
3. Uphold ethical practices to maintain originality in expository writing.

Course Content:	MCQs	SEQs
I. Introduction to Expository Writing: <ol style="list-style-type: none"> i. Understanding expository writing (definition, types, purpose, and applications). ii. Characteristics of effective expository writing (clarity, coherence, and organization). iii. Introduction to paragraph writing. 	05	1
II. The Writing Process: <ol style="list-style-type: none"> i. Pre-writing techniques (brainstorming, free-writing, mind-mapping, listing, questioning, and outlining etc.). ii. Drafting (three stage process of drafting techniques). iii. Revising and editing (ensuring correct grammar, clarity, coherence, conciseness etc.). iv. Proof reading (fine-tuning of the draft). v. Peer review and feedback (providing and receiving critique). 	05	1
III. Essay Organization and Structure: <ol style="list-style-type: none"> i. Introduction and hook (engaging readers and introducing the topic) ii. Thesis statement (crafting a clear and focused central idea) iii. Body Paragraphs (topic sentences, supporting evidence and transitional devices) iv. Conclusion (types of concluding paragraphs and leaving an impact) v. Ensuring cohesion and coherence (creating seamless connections between paragraphs) 	05	1
IV. Different Types of Expository Writing: <ol style="list-style-type: none"> i. Description ii. Illustration iii. Classification iv. Cause and effect (exploring causal relationships and outcomes) v. Process analysis (explaining step-by-step procedures) vi. Comparative analysis (analyzing similarities and differences) 	10	2
V. Writing for Specific Purposes and Audiences:	10	2

<ul style="list-style-type: none"> i. Different types of purposes (to inform, to analyze, to persuade, to entertain etc.). ii. Writing for academic audiences (formality, objectivity, and academic conventions). iii. Writing for public audiences (engaging, informative and persuasive language). iv. Different tones and styles for specific purposes and audiences. 		
<p>VI. Ethical Considerations:</p> <ul style="list-style-type: none"> i. Ensuring original writing (finding credible sources, evaluating information etc.). ii. Proper citation and referencing (<i>American Psychological Association (APA)</i>, <i>Modern Language Association (MLA)</i>, or other citation styles). iii. Integrating quotes and evidence (quoting, paraphrasing, and summarizing). iv. Avoiding plagiarism (ethical considerations and best practices). 	10	2

Recommended Books / Reading Materials:

1. "The Norton Field Guide to Writing" by Richard Bullock, Maureen Daly Goggin, and Francine Weinberg
2. "American Psychological Association". Manual of the American Psychological Association (7th edition).
3. "The Art and Science of Business Communication" (4th Edition) by P.D Chaturvedi and Mukesh Chaturvedi. Pearson.
4. "College Writing Skills with Readings" by John Langan (8th Edition) McGraw Hill.
5. "Patterns for College Writing: A Rhetorical Reader and Guide" (12th edition) by Laurie G. Kirszner and Stephen R. Mandell. Bedford/St. Martin's

Additional Reading:

1. "The St. Martin's Guide to Writing" by Rise B. Axelrod and Charles R. Cooper.
2. "Style: Lessons in Clarity and Grace" by Joseph M. Williams and Joseph Bizup.
3. "Good Reasons with Contemporary Arguments" by Lester Faigley and Jack Selzer.
4. "Writing Today by Richard Johnson-Sheehan and Charles Paine

QUANTATIVE REASONING (I)

Credit Hours: 03 (03+0)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Fundamental numerical literacy to enable them work with numbers, understand their meaning, and present data accurately.
2. Understanding of fundamental mathematical and statistical concepts.
3. Basic ability to interpret data presented in various formats including but not limited to tables, graphs, charts and equations etc.

Course Content:	MCQs	SEQs
I. Numerical Literacy: <ol style="list-style-type: none">i. Number system and basic arithmetic operations.ii. Units and their conversions, dimensions, area, perimeter, and volume.iii. Rates, ratios, proportions, and percentages.iv. Types and sources of data.v. Measurement scales.vi. Tabular and graphical presentation of data.vii. Quantitative reasoning exercises using number knowledge.	15	03
II. Fundamental Mathematical Concepts: <ol style="list-style-type: none">i. Basics of geometry (lines, angles, circles, polygons etc.).ii. Sets and their operations.iii. Relations, functions, and their graphs.iv. Exponents, factoring and simplifying algebraic expressions.v. Algebraic and graphical solutions of linear and quadratic equations and inequalities.vi. Quantitative reasoning exercises using fundamental mathematical concepts.	15	03
III. Fundamental Statistical Concepts: <ol style="list-style-type: none">i. Population and sample.ii. Measures of central tendency, dispersion, and data interpretation.iii. Rules of counting (multiplicative, permutation and combination).iv. Basic probability theory.v. Introduction to random variables and their probability distributions.vi. Quantitative reasoning exercises using fundamental statistical concepts.	15	03

Recommended Books / Reading Materials:

1. "Quantitative Reasoning: Tools for Today's informed Citizen" by Bernard L. Madison, Lynn and Arthur Steen, 2nd Edition, Pearson, 2012.
2. "Quantitative Reasoning for the information Age" by Bernard L. Madison and David M. Bressoud.
3. "Fundamentals of Mathematics" by Wade Ellis, 2008.
4. "Quantitative Reasoning: Thinking of Numbers" by Eric Zaslow, 1st Edition, Cambridge University Press, 2020.
5. "Thinking Clearly and Data: A Guide to Quantitative Reasoning an Analysis" by Ethan Bueno de Mesquita and Anthony Fowler, Princeton University Press, 2021.
6. "Using and Understanding Mathematics: A Quantitative Reasoning Approach" By Bennet, J. O., Briggs, W.L., & Badalamenti, A, 7th Edition, Pearson, 2018.
7. "Discrete Mathematics and its Applications" By Kenneth H. Rosen, 8th Edition, Mc Graw Hill, 2018.
8. "Statistics for Technology: A Course in Applied Statistics" by Chatfield, C, 3rd Edition, Routledge.
9. "Statistics: Unlocking the Power of Data" by Robin H. Lock, Patti Frazer Lock, Kari Lock Morgan, and Eric F. Lock, 3rd Edition, Wiley, 2020.

QUANTATIVE REASONING (II)

Credit Hours: 03 (03+0)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Understanding of logic and logical reasoning.
2. Understanding of basic quantitative modeling and analyses.
3. Logical reasoning skills and abilities to apply them to solve quantitative problems and evaluate arguments.
4. Ability to critically evaluate quantitative information to make evidence-based decisions through appropriate computational tools.

Course Content:	MCQs	SEQs
I. Logic, Logical and Critical Reasoning: <ol style="list-style-type: none">i. Introduction and the importance of logic.ii. Inductive, deductive, and abductive approaches of reasoning.iii. Proportions, arguments (valid; invalid), logical connectives, truth tables and propositional equivalences.iv. Logical fallacies.v. Venn Diagrams.vi. Predicates and quantifiers.vii. Quantitative reasoning exercises using logical reasoning concepts and techniques.	15	03
II. Mathematical Modelling and Analyses: <ol style="list-style-type: none">i. Introduction to deterministic models.ii. Use of linear functions for modeling in real-world situations.iii. Modeling with the system of linear equations and their solutions.iv. Elementary introduction to derivatives in mathematical modeling.v. Linear and exponential growth and decay models.vi. Quantitative reasoning exercises using mathematical modeling.	15	03
III. Statistical Modeling and Analyses: <ol style="list-style-type: none">i. Introduction to probabilistic models.ii. Bivariate analysis, scatter plots.iii. Simple linear regression model and correlation analysis.iv. Basics of estimation and confidence interval.v. Testing of hypothesis (z-test, t-test)vi. Statistical inference in decision making.vii. Quantitative reasoning exercises using statistical modeling.	15	03

Recommended Books / Reading Materials:

1. "Using and Understanding Mathematics: A Quantitative Reasoning Approach" By Bennet, J. O., Briggs, W.L., & Badalamenti, A, 7th Edition, Pearson, 2018.
2. "Discrete Mathematics and its Applications" By Kenneth H. Rosen, Rosen, 8th Edition, Mc Graw Hill, 2018.
3. "Discrete Mathematics with Applications" By Susanna S. Epp, 4th Edition, Cengage Learning, 2010.
4. "Applied Mathematics for Business, Economics and Social Sciences" by Frank S Budnick, 4th Edition, McGraw Hill.
5. "Elementary Statistics: A Step-by-Step Approach" by Allan Bluman, 10th Edition, McGraw Hill, 2017.
6. "Introductory Statistics" by Prem S. Mann, 7th Edition, Wiley, 2010.
7. "Applied Statistical Modeling" by Salvatore Babones, 1st Edition, SAGE Publications Ltd, 2013.
8. "Barons SAT" by Shavron Weiner Green, M.A and Ira K. Wolf, 26th Edition, Barrons Educational Series, 2012.

IDEOLOGY AND CONSTITUTION OF PAKISTAN

Credit Hours: 02 (02+0)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Demonstrate enhanced knowledge of the basis of the ideology of Pakistan with special reference to the contributions of the founding fathers of Pakistan.
2. Demonstrate fundamental knowledge about the Constitution of Pakistan 1973 and its evolution with special reference to state structure.
3. Explain about the guiding principles on rights and responsibilities of Pakistani citizens as enshrined in the Constitution of Pakistan 1973.

Course Content:	MCQs	SEQs
I. Introduction to the Ideology of Pakistan: <ol style="list-style-type: none"> i. Definition and significance of ideology. ii. Historical context of the creation of Pakistan (with emphasis on socio-political, religious, and cultural dynamics of British India between 1857 till 1947). iii. Contributions of founding fathers of Pakistan in the freedom movement including but not limited to Allama Muhammad Iqbal, Muhammad Ali Jinnah., etc. iv. Contributions of women and students in the freedom movement for separate homeland for Muslims of British India. 	05	01
II. Two-Nation Theory: <ol style="list-style-type: none"> i. Evolution of the Two-Nation Theory (Urdu-Hindi controversy, Partition of Bengal, Simla Deputation 1906, Allama Iqbal's Presidential Address 1930, Congress Ministries 1937 Lahore Resolution 1940). ii. Role of communalism and religious differences. 	05	01
III. Introduction to the Constitution of Pakistan: <ol style="list-style-type: none"> i. Definition and importance of a constitution. ii. Ideological factors that shaped the Constitution(s) of Pakistan (Objectives Resolution 1949). iii. Overview of constitutional developments in Pakistan. 	05	01
IV. Constitution and State Structure: <ol style="list-style-type: none"> i. Structure of Government (executive, legislature, and judiciary). ii. Distribution of powers between federal and provincial governments. iii. 18th Amendment and its impact on federalism. 	05	01
V. Fundamental Rights, Principles of Policy and Responsibilities:	05	01

<ul style="list-style-type: none"> i. Overview of fundamental rights guaranteed to citizens by the Constitution of Pakistan 1973 (Articles 8-28). ii. Overview of Principles of Policy (Articles 29-40). iii. Responsibilities of the Pakistani citizens (Article 5). 		
<p>VI. Constitutional Amendments:</p> <ul style="list-style-type: none"> i. Procedures for amending the Constitution. ii. Notable constitutional amendments and their implications. 	05	01

Recommended Books / READING MATERIALS

1. "The Struggle for Pakistan" by I.H. Qureshi.
2. "Pakistan the Formative Phase" by Khalid Bin Sayeed, 2nd Edition, Oxford University Press, 1991.
3. "Ideology of Pakistan" by Sharif-ul-Mujahid.
4. "Constitutional and Political Development of Pakistan" by Hamid Khan.

Supplementary Books

5. "The Making of Pakistan: A Study in Nationalism" by K.K. Aziz, Sang-E-Meel Publication, 2002.
6. "The. Constitution of Pakistan 1973". Original.
7. "The Struggle for Pakistan: A Muslim Homeland and Global Politics" by Ayesha Jalal, Belknap Press: An Imprint of Harvard University Press; Bilingual edition, 2017.
8. "The Idea of Pakistan" by Stephen P. Cohen, 2nd Edition, Brookings Institution Press, 2006.

ISLAMIC STUDIES

Credit Hours: 02 (02+0)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Demonstrate enhanced knowledge of Islamic foundational beliefs, practices, historical development, spiritual values, and ethical principles.
2. Describe basic sources of Islamic law and their application in daily life.
3. Identify and discuss contemporary issues being faced by the Muslim world including social challenges, gender roles and interfaith interactions.

Course Content:	MCQs	SEQs
I. Introduction to Islam: <ol style="list-style-type: none"> i. Definition of Islam and its core beliefs. ii. The Holy Quran (introduction, revelation, and compilation). iii. Hadith and Sunnah (compilation, classification, and significance). iv. Key theological concepts and themes (Tawhid, Prophet hood, Akhirah etc.) 	05	1
II. Sirah of the Holy Prophet (Peace Be Upon Him) as Uswa-i-Hasana: <ol style="list-style-type: none"> i. Life and legacy of the Holy Prophet PBUH. ii. Diverse roles of the Holy Prophet PBUH (as an individual, educator, peace maker, leader etc.) 	05	1
III. Islamic History and Civilization: <ol style="list-style-type: none"> i. World before Islam. ii. The Rashidun Caliphate and expansion of Islamic rule. iii. Contribution of Muslim scientists and philosophers in shaping world civilization. 	05	1
IV. Islamic Jurisprudence (Fiqh): <ol style="list-style-type: none"> i. Fundamental sources of Islamic jurisprudence. ii. Pillars of Islam and their significance. iii. Major schools of Islamic Jurisprudence. iv. Significance and principles of ijtiḥad. 	05	1
V. Family and Society in Islam: <ol style="list-style-type: none"> i. Status and rights of women in Islamic teachings. ii. Marriage, family, and gender roles in Muslim society. iii. Family structure and values in Muslims society. 	05	1
VI. Islam and the Modern World: <ol style="list-style-type: none"> i. Relevance of Islam in the modern world (globalization, challenges, and prospects). ii. Islamophobia, interfaith dialogue, and multiculturalism. iii. Islamic viewpoint towards socio-cultural and technological changes. 	05	1

References / Reading Materials:

1. "The Five Pillars of Islam: A Journey Through the Divine Acts of Worship" by Muhammad Mustafa Al-Azarni.
2. "The Five Pillars of Islam: A framework for Islamic Values and Character Building" by Musharraf Hussain.
3. "Towards Understanding Islam" by Abul A' la Mawdudi.
4. "Islami Nazria e Hayat" by Khurshid Ahmad.
5. "An Introduction to Islamic Theology" by John Renard.
6. "Islamic Civilization Foundations Belief & Principles" by Abu1 A' la Mawdudi.
7. "Women and Social Justice: An Islamic Paradigm" by Dr. Anis Ahmad.
8. "Islam: Its Meaning and Message" by Khurshid Ahmad.

NATURAL SCIENCES (BIOPHYSICS)

Credit Hours: 03 (02+01)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Acquire Knowledge of the fundamental concepts of physics in the context of biological systems.

Course Content	MCQ	SEQ
I. Essentials of thermodynamics i. Basic principles of different forms of energy- Heat and Thermodynamics ii. Concept of entropy iii. Enthalpy and Gibb's free energy iv. Boltzmann distribution	5	01
II. Molecular Transport in living cells i. Diffusion, random motion, diffusion equation ii. Osmosis, osmotic pressure in liquid and gas iii. Diffusion across membrane iv. Membrane potential.	3	0.5
III. Methods of studying macromolecules i. Viscosity measurements ii. Chromatographic methods; and free-boundary electrophoresis iii. Sedimentation velocity, and sedimentation equilibrium.	3	01
IV. Interactions of molecules in 3-D space-determining binding and dissociation constants i. Intermolecular interactions ii. Interamolecular interactions	3	0.5
V. Biomolecular Structure i. DNA ii. RNA iii. POLYPEPTIDES	5	0.5
VI. Biophysical processes i. Biomechanics ii. Bioenergetics iii. Biomagnetism	3	01
VII. Physics of ion channels.	5	0.5
VIII. Order and disorder in biological systems	3	01

Practical	OSPE
Determination of the optical density (absorbance) of Bromophenol blue dye through spectrophotometer Determination of pressure at the bottom most position of a cylinder using the concept of thermodynamic principle	03

Derivation of Beer-Lambert Law Separation of components of two different colored liquids using thin layer Chromatography	
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Recommended Books/ Reading Materials:

1. Nelson P, 2004. Biological Physics, Energy, Information and Life. 1st Edition; WH Freeman & Company.
2. Kirsten et al., 2010. Introduction to Biological Physics for the Health and Life Sciences. 2nd Edition; John Wiley & Sons.
3. Davidovits P, 2013. Physics for Biology & Medicine. 4th Edition; Academic Press.
4. Newman, 2010. Physics of the Life Sciences. Springer.
5. Duncan, 1975. Physics for Biologist. Blackwell Science.

ARTS & HUMANITIES (BEHAVIOURAL SCIENCES)

Credit Hours: 02 (02+0)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Accurately describe the influence and potential implications of culture and community context on health behaviors, beliefs and outcomes, as well as how physicians should appropriately integrate this knowledge into patient care.
2. Build a comprehensive, accurate, and relevant patient history using an approach that supports a therapeutic alliance between patient and physician and that displays self-awareness and reflective practice.
3. Effectively explain to a patient, using the principles of shared decision- making, the patient's medical condition and/or treatment options (for common conditions and risk factors) within the context of that patient's background, education and belief systems.
4. Provide patient-centered behavioral guidance, and explain the appropriate theoretical model that supports the approach.
5. Accurately describe how social determinants of health influence health outcomes and how physicians can incorporate this knowledge in the care of patients.
6. Accept and report personal errors, discuss the potential sources of errors, and develop an action plan to reduce the risk of future errors.

Course Content	MCQ	SEQ
I. Introduction to Behavioral Sciences and its importance in health: i. Bio-Psycho-Social Model of Health Care and the Systems Approach ii. Normality Vs Abnormality iii. Professionalism and desirable Attitudes in Health Professionals	02	0
II. Life Cycle: i. Behavioral aspects of development through lifecycle (Infancy, Childhood, Adolescence, Adulthood) ii. Death and Dying and Bereavement	04	01
III. Biological and Psychological basis of Behavior: Psychodynamic factors (Learning, Memory, Thinking, Perception, Motivation, Personality, Intelligence, Emotions and Stress)	07	02

IV. Social and Anthropological basis of Behavior: i. Sociological aspects of health and illness (Social Class, Gender, Health belief model, Stigma, Sick role, Ethnicity, Groups, Illness and Sickness) ii. Anthropological aspects of Health (Culture, sensitive assessment, Health disparity and Health inequality)	07	01
V. Illness and healthcare professional relationship: i. Medical Communication (Medical interview, non-pharmacological interventions, Breaking bad news, Crisis intervention) ii. Coping with the disability (Coping, Stress, Anxiety, Self-help groups, Pain management, Psychosocial aspects of disability) iii. Doctor patient relationships (Psychological reactions, Models of doctor pt. relationship, Treatment adherence, Psycho-trauma & Post Traumatic Stress Disorder) iv. Psychosocial aspects of disease and illness (Various medical conditions, Disability including intellectual disability)	10	02

Recommended Books/ Reading Materials

1. "Psychology and sociology applied to medicine: An illustrated color text", 3rd ed. by Beth alder2004
2. "Behavioral Science in Medicine", 2nd Ed., Barbara Fadem 2012
3. "Handbook of Behavioral sciences", 3rd Ed. MH Rana 2012
4. "Integrating Behavioral sciences in healthcare",2nd Ed. Asma Humayun and Michel Herber 2011

SOCIAL SCIENCES (MEDICAL SOCIOLOGY)

Credit Hours: 02(02+0)

Learning Outcomes/Objectives:

By the end of this course, students will be able to:

1. Understand the historical progression and evolution of healthcare systems and practices.
2. Analyze the interconnectedness of body, mind, illness, and environmental factors shaping health outcomes.
3. Critically evaluate diverse theories, research methodologies, and ongoing debates in medical sociology.

Course Content:	MCQs	SEQs
I. Evolution of Health and Healing i. Historical Development of medical practices and knowledge. ii. Evolution of Healthcare Systems and Treatment Modalities. II. Body, Mind, Illness, and Environment i. Impact of Environmental factors on health and Disease ii. Interconnection between Physical and Mental Health	5	1
III. Theories, Research, and Debates of Medical Sociology i. Overview of Medical Sociology Theories ii. Research Methods in Medical Sociology iii. Current Debates and Controversies in Medical Sociology IV. Social, Environmental, and Occupational Factors in Health and Illness i. Influence of Socioeconomic Status on Health ii. Impact of Environment and Living Conditions on Health iii. Occupational hazards and Health Implications	5	1
V. The meaning of Health and Illness from the Patient's Perspective i. Patient's Subjective Experience of health and Illness ii. Cultural and Social Influences on Perception of Health and Illness iii. Patient Empowerment and Decision-Making in Healthcare VI. Historical Transformation of health Professions and the Health Workforce i. Evolution of Healthcare Professions and Roles ii. Changes in Healthcare Delivery Systems. iii. Impact of technological Advancements on Healthcare Professions.	5	1
VII. Social and Cultural Factors Surrounding the Creation and labeling of Diseases i. Social Construction of Diseases and Illnesses ii. Cultural Interpretations and Stigmatization of diseases.	8	2

<ul style="list-style-type: none"> iii. Medicalization and Pathologization of Behavior. <p>VIII. Disparities in Health, Access to Healthcare, and the Healthcare received</p> <ul style="list-style-type: none"> i. Socioeconomic Disparities in Health Outcomes. ii. Access Barriers to Healthcare services. iii. Quality Discrepancies in Healthcare Provision. 		
<p>IX. Organizational and ethical issues in medicine including rising costs and medical technology; and health care reform.</p> <ul style="list-style-type: none"> i. Rising Healthcare costs and Technology. ii. Healthcare Reforms and Ethical Considerations. iii. Patient Rights, Consent, and Ethical Dilemmas in Medicine. 	7	1

Recommended books / Reading Materials

1. "Medical Sociology" by William Cockerham, 15th Edition. B/W Illustrations
Published September 30, 2021, by Routledge.
2. "A Sociology of Health" by David Wainwright, 2008
3. "The Sociology of Health and Illness Critical Perspective"s,11th Edition by
Peter Conrad, Valerie Leiter Published: June 2023
4. "The Sociology of Health, Illness, and Health Care: A Critical Approach", 7th
Edition by Rose Weitz, 2016.



PERLs MODLUE

PERLs Module

Attributes	Competencies	Portfolio Entries Per Semester							
PROFESSIONALISM SKILLS		1	2	3	4	5	6	7	8
Communicator	1. Demonstrate non-verbal, verbal, written and electronic communication skills								
	2. Communicate effectively with patients and families								
Caring & Empathic	3. Demonstrate respect of diversity in gender, age, culture, race, religion, disabilities, and sexual orientation for patients, peers, colleagues, and other health professionals.								
	4. Demonstrate empathy in patient encounters								
Responsible & Accountable	5. Follow the dress code and rules and regulation of the institution and the profession								
	6. Demonstrate punctuality								
	7. Demonstrate availability and timely delivery of patient care as and when required								
	8. Take responsibility of one's actions and be accountable to patients and teachers								
Team Player	9. Work respectfully and effectively with their peers, seniors, and juniors								
	10. Participate in different team roles								
	11. Work with other health professionals to establish and maintain a climate of mutual respect, dignity								
Self-Aware	12. Identify personal strengths and areas of improvement								
	13. Identify limits in one's own level of knowledge and expertise								
	14. Show willingness to seek help through advice and support in patient care when required								
ETHICS SKILLS									
Ethical Practitioner	15. Obtain verbal and written informed consent								
	16. Comply with relevant laws and regulation including the minimum standards of health delivery and demonstrate patient safety in all aspects of healthcare delivery								
Ethical Researcher	17. Maintain research participants confidentiality								

	18. Demonstrate awareness of publication ethics								
Digital Citizen	19. Keep professional data and information safe								
	20. Design a professional digital footprint								
	21. Understand cyberbullying, harassing, sexting, or identity theft								
RESEARCH SKILLS									
Evidence based practitioner	22. Make informed decisions based on up-to- date scientific evidence								
	23. Locate credible scientific data								
Writer & Presenter	24. Develop a research proposal								
	25. Develop a research report/article								
	26. Present in college or on scientific forums								
LEADERSHIP SKILLS									
Resilient & Adaptable	27. Demonstrate flexibility in adjusting to changing environments								
	28. Demonstrate healthy coping mechanisms to respond to stress								
Systems thinker	29. Recognize own role as contributor towards management and leadership in health services								
	30. Identify new advancements in guidelines, standards, technologies, and services that can improve patient outcomes								
Self-directed learner	31. Seek active feedback from colleagues, and other health professionals								
	32. Incorporate reflection in routine practice to set and track learning goals								
	33. Seek membership in professional networks and societies								



INTER- DISCIPLINARY COURSES

BASIC BIOCHEMISTRY
03 CREDIT HOURS
(45 MCQs + 09 SEQs)

Learning Outcomes/Objectives:

By the end of the course, students will be able to

1. Apply chemical principals to biological phenomena.
2. develop knowledge of the structure and function of the major classes of biological molecules and their role in cellular structure, function and bioenergetics.
3. Know the clinical outcomes of any change in the structure and functions of these biological molecules.

Course Content:	MCQs	SEQs
I. Introduction i. Introduction of carbohydrates ii. Introduction of lipids. iii. Bioenergetics and oxidative phosphorylation.	07	01
II. Carbohydrate metabolism i. Glycolysis, TCA (Tricarboxylic acid cycle) ii. Gluconeogenesis, Glycogen metabolism, metabolism of monosaccharaide and disaccharides, Pentose phosphate shunt, iii. Glycosaminoglycan and Glycoproteins	06	01
III. Dietary lipid metabolism i. Fatty acid metabolism ii. Cholesterol metabolism.	06	01
IV. Proteins and Protein Metabolism i. Amino acids, structure of proteins ii. Globular proteins, hemoglobin, myoglobin iii. Disposal of nitrogen, amino acid degradation and synthesis,	10	02
V. Vitamins, minerals and diabetes mellitus	04	01
VI. Enzymes i. Classifications, functions, ii. regulation and diagnostic significance, iii. Michaelis Menten equation.	04	01
VII. Cell i. Cell structure, ii. Cell to cell signaling and cytoskeleton, iii. Receptors iv. Water and PH balance, v. The feed/fast cycle, vi. Metabolic effects of insulin and glucagon.	06	01
VIII. DNA RNA and Protein structure i. DNA structure ii. RNA structure i. Protein structure	02	01

Recommended Instructional / Reading Materials:

1. Lippincott's illustrated review by Pamela C.Champe latest edition (8th)
2. Harpers Illustrated Biochemistry by Peter J Kennelly, Victor W Rodwell latest edition (32nd)

BASIC PHYSIOLOGY

**03 CREDIT HOURS
(45 MCQs + 09 SEQs)**

Learning Outcomes/Objectives:

The students will be able to:

1. Describe the physiological aspects that govern the functions of the human body as a whole.
2. Describe the role of cell, blood, skin and body fluids in maintenance of homeostasis.
3. Describe how communication and coordination take place in the body with the help of endocrine and nervous systems
4. Discuss the functions of individual organ systems such as nerve and muscle, cardiovascular system, renal system, digestive system, respiratory system and reproductive system.
5. Understand how these individual systems interact to yield an integrated physiological response in human beings

Course Content:	MCQs	SEQs
Cell and homeostasis Homeostasis and control mechanisms Basic functions of cell and its organelles	4	1
Nerve and Muscle RMP, Action potential: Origin, phases Types of muscles, differences between skeletal, smooth and cardiac muscles, structure and mechanism of contraction of skeletal muscle, neuromuscular transmission	4	1
Heart and circulation Properties of myocardium, rhythmical generation of cardiac impulse, tachycardia and bradycardia, cardiac cycle, heart sounds Classification and functions of blood vessels, types of circulation, types of blood flow, functions of lymphatic system, arterial blood pressure and its short term and long-term control, circulatory shock	6	1
Blood Physiology Composition and functions of blood RBC: synthesis and functions, anemia WBCs: Classification and functions Immunity: definition, types Platelets: physical characteristics and functions, mechanisms of hemostasis ABO blood groups and transfusion reactions	5	1
Respiration Mechanics of breathing, lung compliance, lung volumes and capacities, transport of oxygen and carbon dioxide	4	1
Renal, Body fluids Body fluid compartments, structure and functions of the kidney and nephron, GFR and its determinants, micturition reflex	4	1
GIT Basic structure and functions of alimentary tract, GI motility (small and large intestine), secretions of saliva and gastric juice, vomiting reflex, defecation reflex	4	1
CNS Basic organization of the nervous system, types of neurons and	6	1

nerves, types and properties of synapses, types of neurotransmitters, Functions of spinal cord, sensory cortex, motor cortex, basal ganglia, cerebellum, thalamus, hypothalamus Divisions and functions of the autonomic nervous system		
Endocrinology Hormones: definition, classification Functions of pituitary hormones, thyroid hormones, adrenocortical hormones, pancreatic hormones, parathyroid hormone	6	1
Skin and body temperature Functions of skin, mechanisms of heat production and heat loss, role of hypothalamus	2	

Recommended Instructional / Reading Materials:

1. Guyton and Hall Textbook of Physiology 14th ed
2. Ross and Wilson Anatomy and Physiology in Health and Illness, 13th ed.

BASIC ANATOMY
03 CREDIT HOURS
(45 MCQs + 09 SEQs)

Learning Outcomes/Objectives:

The students will be able to:

1. Have an understanding of the Basic structural components of human body
2. Comprehend the basic anatomical structure of human organs and systems

Course Content:	MCQs 45	SEQs 09
I. General Anatomy: Descriptive anatomical terms of Planes, axes, and general body organization Basic structure of skin, musculoskeletal, vascular and nervous systems.	06	01
II. Gross Anatomy of Digestive system Basic structural overview of Oral Cavity, pharynx, esophagus, stomach, small, large intestine and major abdominal viscera.	05	01
III. Gross Anatomy of Urinary system Basic structural overview of Kidney, ureter, bladder and urethra	03	01
IV. Gross Anatomy of cardiovascular & lymphatic system Basic structural overview of Heart, Pericardium, arterial, venous and Lymphatic systems.	05	01
V. Gross Anatomy of respiratory system Basic structural overview of Nose, paranasal sinuses, larynx, trachea, bronchus, pleura, lungs and diaphragm	03	01
VI. Gross Anatomy of reproductive system Basic structural overview of <u>Male:</u> Testis, spermatic cord, penis and prostate <u>Female:</u> Ovaries, fallopian tubes, uterus, vagina, vulva and breast.	04	01
VII. Gross Anatomy of endocrine system: Basic structural overview of Pituitary, thyroid, parathyroid, thymus, adrenal gland and pancreas (endocrine part).	03	
VIII. Gross Anatomy of Nervous system & special sensory organs Basic structural overview of Brain, Spinal cord, Ear, Eye, Taste buds, Nose.	03	01
IX. Gross Anatomy of Musculoskeletal system: Basic structural overview of axial and appendicular skeleton and muscles of upper and lower limb	05	01
X. Histology: Histology of Cells, Epithelium, Connective tissue, Cartilage, Bone, Muscle, cardiovascular, Blood and Lymphoid system	08	01

Recommended Instructional / Reading Materials:

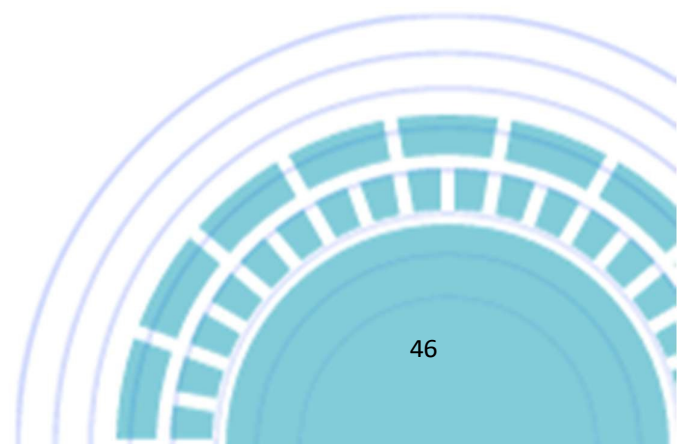
1. Snell's Clinical Anatomy by Regions Latest Edition (Chapter 1)
2. Waugh, Anne, Grant, Allison. 2014. Ross and Wilson's anatomy and physiology in health and illness
3. Histology by Prof. Laiq Hussain



**Allied Health Sciences
Curricula 2024**



**BS DENTAL
TECHNOLOGY
CURRICULUM**



BS DENTAL TECHNOLOGY

1. Introduction To Program

Dental Technology is field of dentistry where technicians design and construct dental appliances to improve oral health. Dental technologists are members of the dental healthcare team who work in the laboratory on prescription from a dental clinician. The BS (Hons) Dental Technology program of UHS is a 4 years program that focuses on developing skills of the student to meet updated requirements of dental technology in terms of the design, construction, repair or alteration of dental prosthetic, restorative and orthodontic devices.

2. Aims of the Program

The aim of BS (Hons) Dental Technology program is to equip the students with relevant professional knowledge, skills, techniques and ethical values to enable them to apply their acquired expertise at level between the doctors and the patient for efficient health service delivery.

3. Objectives of the Program

Dental Technology education and training should enable the student to:

- Develop accuracy and meticulousness to attain high levels of ethics and technical proficiency.
- Assess the technical and non-technical skills in a standardized and reproducible environment.
- Strengthen the decision power and exercise appropriate judgment skills, to be applied especially during crisis.
- Develop good leadership, problem solving and administrative skills.
- Develop and analyze innovative strategies for effective communication with the patients and the allied healthcare personnel.
- Demonstrate interdisciplinary team building strategies for effective coordination between various Allied Health Disciplines.
- Demonstrate understanding of the basic concepts of professional behavior and legal implications of the work environment.
- Demonstrate the knowledge of his / her role in health care delivery system.
- Establish and maintain continuing education as a function of growth and maintenance of professional competence.

4. Learning Outcomes of the Program

Dental Technology education and training should enable the student to:

- Understand the current advances in dental technology and learn updated knowledge and skill.
- Describe the role of the dental technician in health care settings.
- Demonstrate a capacity to design, implement and evaluate technical skills at the individual or community level.
- Understand, use, manage and handle problems in dental equipment and dental materials and new. advances in appliance uses, application and environment through referrals for protection and recycling.

- Assisting a Dentist in making dental ceramics.
- Recommending & designing the dental structures for a patient and designing the dental accessories.
- Demonstrate the acquisition or update of dental health knowledge and skills relevant to their professional practice.
- Have an understanding of the scope, scientific basis, capabilities and limitations of the major subject areas within dentistry.
- Be proficient in understanding, diagnosis and basic dental care procedures.
- Work as technical assistants to dental surgeons for dental surgeries.
- Understand their own limitations when fabrication restoration and thus know when to refer for specialist advice.
- Understand and undertake all health research and to apply key findings into dental health practice.
- Help in establishment of better technical facilities in a hospital.
- Be updated with mechanical, chemical and other relevant Engineering disciplines.
- Involved in procedures of high-quality dental research e.g implant

5. Carrier Opportunities of the Graduates

- Setting up their own dental laboratory
- Teaching
- Post graduations in fields relevant
- Working in research and development with International dental companies
- Become technical advisors

6. Program Details

Courses (with Learning objectives, Content, Reference Books/Materials)

- General Subjects (Minimum 30 Credit Hours)
- Interdisciplinary (Minimum 12 Credit Hours)
- Major Subjects (Minimum 72 Credit Hours)
- Capstone Project (03 Credit Hours)
- Internship/Field Experience (03 Credit Hours)

7. Program Structure

GENERAL SUBJECT	
11 Courses	
30 Credit Hours	
Subject	Credit Hours
1. Arts and Humanities	02+0
2. Natural Sciences	02+01
3. Social Sciences	02+0
4. Functional English	03+0
5. Expository Writing	03+0
6. Quantitative Reasoning (I and II)	06 (2x03)
7. Ideology and Constitution of Pakistan	02+0
8. Islamic Studies	02+0
9. Applications of Information and Communication Technologies (ICT)	02+01

10. Entrepreneurship	02+0
11. Civics and Community Engagement	02+0

INTERDISCIPLINARY SUBJECTS	
04 Courses	
12 Credit Hours	
Subject	Credit Hours
1. General Pathology	03+0
2. Basic Anatomy	03+0
3. Basic Biochemistry	03+0
4. Basic Physiology	03+0

ENGLISH PROFICIENCY COURSES
12 Credit Hours

PERLs
08 Credit Hours

MAJOR SUBJECTS	
27 Courses	
72 Credit Hours (Minimum)	
Subject	Credit Hours
1. Tooth Morphology	03
2. Dental Occlusion	02
3. Fundamentals of Science of Dental Materials	02
4. Oral Biology	03
5. Prosthetic Dental Materials	03
6. Partial Denture Acrylic	04
7. Oral Pathology	03
8. Restorative Dental Materials	02
9. Periodontology	02
10. Fundamentals of orthodontics	03
11. Cast Partial Denture	04
12. Fundamentals of fixed Prosthodontics	04
13. Fundamentals of Oral and maxillofacial radiology	02
14. Fixed Metal Restorations	04
15. Preventive Dentistry	02
16. Myofunctional Orthodontics	03
17. Complete Denture Prosthodontics-I	04
18. Complete Denture Prosthodontics-II	03
19. Digital Dental technology	03
20. Biosafety and Biowaste Management	03
21. Removable Orthodontic Appliances	04
22. Maxillofacial Prosthodontics	02
23. Implant Dentistry	02

24. Fixed orthodontic appliances	04
25. Advanced Prosthodontics	03
26. Ceramic Restorations-I	03
27. Ceramic Restorations-II	03
Total	80

CAPSTONE PROJECT

03 Credit Hours

INTERNSHIP/ FIELD EXPERIENCE

03 Credit Hours

SCHEME OF STUDIES

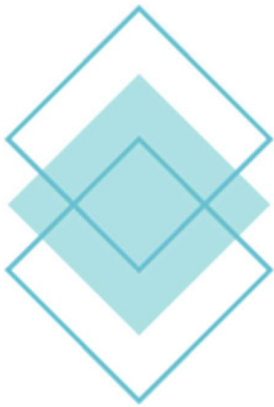
SEMESTER	COURSE CODE	COURSE TITLE	THEORY	PRACTICAL	CREDIT HOURS
1st Semester	GEFE	Functional English	03	0	03
	GEQR	Quantitative Reasoning-I	03	0	03
	GENS	Natural Sciences	02	1	03
	GEAH	Arts and Humanities	02	0	02
	GEICP	Ideology and Constitution of Pakistan	02	0	02
	IDC	Basic Biochemistry	03	0	03
	PERL-I	PERL-I	01	0	01
Total Credit Hours					17
2nd Semester	GEEW	Expository Writing	03	0	03
	GEQR	Quantitative Reasoning-II	03	0	03
	GESS	Social Sciences	02	0	02
	GEIE	Islamic Studies/Ethics	02	0	02
	BAN	Basic Anatomy	03	0	03
	BPH	Basic Physiology	03	0	03
	PERL-II	PERL-II	01	0	01
Total Credit Hours					17
3rd Semester	GEE	Entrepreneurship	02	0	02
	GECCM	Citizenship Education and Community Engagement	02	0	02
	GEICT	Applications of Information and Communication Technologies	02	1	03
	GPA	General Pathology	03	0	03
	TM	Tooth Morphology	02	1	03
	DO	Dental Occlusion	01	01	02
	EPC-1	English Proficiency-1	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					18
4th Semester	FSDM	Fundamentals of Science of Dental Materials	02	0	02
	OB	Oral Biology	03	0	03
	PDM	Prosthetic Dental Materials	02	1	03
	PDA	Partial Denture Acrylic	01	3	04

	OP	Oral Pathology	02	1	03
	EPC-2	English Proficiency-2	02	0	02
	PERL-IV	PERL-IV	01	0	01
Total Credit Hours					18
5th Semester	RDM	Restorative Dental Materials	01	1	02
	PD	Periodontology	02	0	02
	FO	Fundamentals of orthodontics	01	2	03
	CPAD	Cast Partial Denture	02	2	04
	FFP	Fundamentals of fixed Prosthodontics	02	2	04
	FOMR	Fundamentals of Oral and maxillofacial radiology	01	1	02
	EPC-3	English Proficiency-3	02	0	02
	PERL-V	PERL-V	01	0	01
Total Credit Hours					20
6th Semester	FMR	Fixed Metal Restorations	01	3	04
	PCD	Preventive Dentistry	02	0	02
	MO	Myofunctional Orthodontics	01	2	03
	CPD-I	Complete Denture Prosthodontics-I	02	2	04
	CPD-II	Complete Denture Prosthodontics-II	01	2	03
	EPC-4	English Proficiency-4	02	0	02
	PERL-VI	PERL-VI	01	0	01
Total Credit Hours					19
7th Semester	DDT	Digital Dental technology	02	01	03
	BBM	Biosafety and Biowaste Management	03	0	03
	RO	Removable Orthodontic Appliances	01	3	04
	MP	Maxillofacial Prosthodontics	01	1	02
	In	Internship/Field Experience	03	0	03
	EPC-5	English Proficiency-5	02	0	02
	PERL-VII	PERL-VII	01	0	01
Total Credit Hours					18
8th Semester	IMD	Implant Dentistry	01	1	02
	FOP	Fixed orthodontic appliances	01	3	04
	ADP	Advanced Prosthodontics	02	1	03
	CR	Ceramic Restorations-I	01	2	03

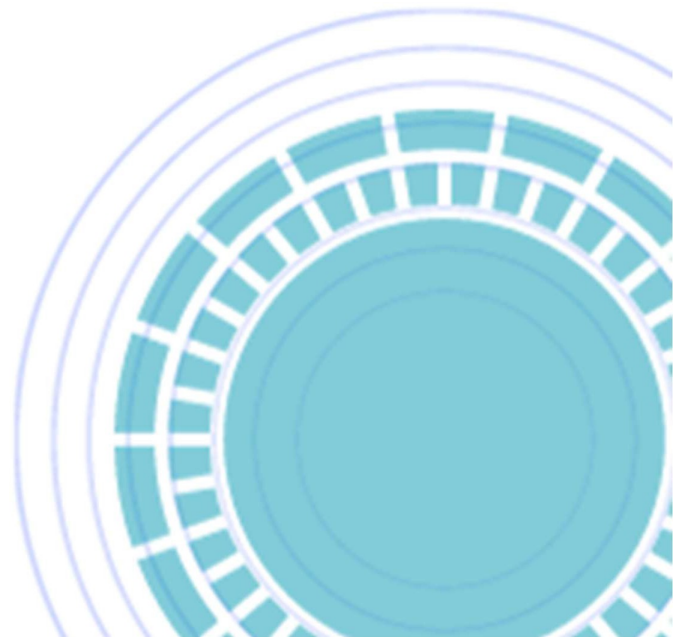
	CR	Ceramic Restorations-II	01	2	03
	Cap	Capstone Project	03	0	03
	EPC-6	English Proficiency-6	02	0	02
	PERL-VIII	PERL-VIII	01	0	01
Total Credit Hours					21



**Allied Health Sciences
Curricula 2024**



BS MEDICAL IMAGING TECHNOLOGY CURRICULUM



BS. MEDICAL IMAGING TECHNOLOGY

Introduction to Programme:

The Medical Imaging Technology course is a four-year undergraduate program designed to provide students with foundational knowledge in radiological investigations. The focus is on imparting essential technical skills for the operation and maintenance of diverse imaging equipment, including X-ray machines, ultrasound/Echocardiography devices, magnetic resonance imaging (MRI) scanners, computed tomography (CT) scanners, nuclear medicine, and specialized Interventional Radiology/cardiac equipment. In response to the expanding healthcare sector in Pakistan, there is a demand for proficient medical imaging technologists capable of operating and maintaining imaging equipment. These professionals play a vital role in supporting radiologists and physicians in image interpretation, ensuring patient safety during imaging procedures, and contributing significantly to the diagnosis, treatment, and monitoring of various medical conditions.

SPECIFIC LEARNING OUTCOMES

Following competencies will be expected from a student completing 4 years degree course in Medical Imaging Technology. The student should be proficient to:

- Provide quality patient care in routine as well as advanced imaging procedures
- Use digital imaging and information technology equipment competently, through the application of the principles and theories of its operation
- Evaluate performance characteristics of equipment
- Implement an effective radiation protection program
- Apply the knowledge of human sectional anatomy to related clinical procedures
- Apply clinical imaging protocols to specialized imaging procedures
- Apply the principles of management, organizational behavior, supervision, budgeting, human resource management, and labor relations in a medical imaging environment
- Enhance human interaction and performance in the clinical environment by integrating liberal education principles

The MI Technologist should be able to integrate seven areas of key importance in the imaging departments. The seven areas include **patient care, use of technology, optimization of dose, clinical responsibility, organization, quality assurance and education and training.**

Competency statements:

1. Patient Care

- Perform proper identification of the patient
- Ensure that the patient gives or has given informed consent having first given the patient a clear explanation of the procedure to ensure his cooperation.
- Meet ethical/moral considerations
- Ensure that no previously performed imaging procedure has already provided the information requested.

- Ensure that a relevant clinical history has been obtained
- Ensure that no concurrent treatment or investigation will prevent a good result
- Ensure that any preparatory instructions, pre medications or contrast media have been administered correctly
- Ensure that an appropriate check regarding pregnancy has been performed and that appropriate action has been taken.
- Consider the radiation protection status of the patient
- Perform appropriate after-care
- Use appropriate facilities and methods to prevent cross infection with particular emphasis on precaution standards for blood borne pathogens, specifically HIV and hepatitis.
- Evaluate the patient's condition prior to the examination in order to make judgment as to the best method to use.
- Initiate basic life-support methods if necessary.
- React appropriately to other emergency situations
- Give intravenous injections for the purpose of imaging provided that the appropriate training and authorization has been given.

2. Use of Imaging Technology

- Make a judgment as to the purpose of the request and take the correct action.
- Position the patient, source of radiation, image recording device and any ancillary equipment such that the final image is optimum.
- Make a judgment as to necessary adaptations to departmental protocols and take appropriate action.
- Use the equipment safely and correctly
- Ensure that any error in the final image is not due to incorrect usage of equipment.
- Select suitable combinations of exposure factors and image recording materials to produce optimum images allowing for the patient's conditions.
- Maintain and control all the steps involved in the production and storage of a permanent of visible image.
- Assess the resultant image for suitability for its purpose.

Where digital imaging is involved, in addition to the previously stated elements, the MIT must be competent to:

- Apply a detailed knowledge of anatomy in different sectional planes in order to be able to correlate the position of the patient with the require three-dimensional information.
- Select programs.
- Give advice as to the likely quality of the image using the parameters selected e.g. use of compensating filters, timing of injection, selection of exposure factors etc.
- Record, adapt and reconstruct data to obtain optimum image quality.
- Store and retrieve information.
- Assess the resultant images for suitability for interpretation and diagnosis.

3. Optimization of dose

- Select and manipulate the exposure factors and image recording materials such that the dose to the patient is minimized whilst giving the optimum image.
- Ensure that all equipment to be used is fully fit for its purpose.
- Use all equipment and methods in order to ensure minimization of dose to patient, staff and public and to ensure that no person receives unnecessary irradiation.

- Ensure that any protocols relating to the imaging of patients of child-bearing capability are applied.
- Fulfill any requirements for the recording of dose.
- Take appropriate action in radiological emergency situations.

4. Clinical Responsibility

- Be professionally accountable for his actions.
- Make judgments as to his professional limitations and take appropriate action.
- Maintain confidentiality of information.

5. Organization

- Efficiently organize the performance of an individual examination.
- Efficiently organize work within the area for which he is responsible.
- Ensure compliance with all applicable legislation relating to his work.

6. Quality Assurance

The MIT must be competent in assessing the quality of his work. Regard should be given to each of the headings above (1 - 6)

7. Education and Training

The MIT must be competent to share his knowledge and clinical experience with the students of MIT program in a professional manner.

Scope & Employment Perspective of Program

Medical Imaging Technology (MIT) is a specialized field in healthcare, utilizing imaging modalities for diagnosis and treatment. The program in MIT in Pakistan offers promising career prospects due to the field's significance and increasing demand for skilled professionals. Graduates can pursue opportunities in hospitals, imaging centers, clinics, and research institutions.

Some potential job roles include:

A. Clinical Setup: Public/ Private Sectors:

- MRI Technologist
- CT Technologist
- Ultrasound Technologist
- Echo Technologists
- Mammography Technologist
- Nuclear Medicine Technologist
- Cath Lab Technologist
- Interventional technologists

B. Corporate Setup:

- Clinical Application Specialist
- MIT Team lead Manager

C. Academics and Research:

- Programme Coordinator
- Research Supervisors
- Lecturer etc.

The demand for skilled medical imaging technologists is increasing in Pakistan due to expanding healthcare infrastructure and advancing technology. As the importance of early diagnosis and preventive healthcare rises, these professionals are in high demand. To enhance career prospects, staying updated on the latest advancements, obtaining certifications, and gaining practical experience through internships are essential. Continuous learning ensures competitiveness and opens opportunities for career growth in Pakistan's healthcare sector. International job opportunities are also available, especially in Gulf countries and the UK.

d. Further studies after graduation:

- Masters of science in Medical Imaging technology (MSMIT)
- Masters of science in diagnostic ultrasound (MSDU)
- Ms. in Biomedical Engineering (BMES)
- Masters in Health Administration
- Masters in Public Health
- Doctor of philosophy in Medical Imaging Technology (PH-MIT)
- Doctor of philosophy in Diagnostic ultrasound (PH-DU)

1. General Education (30 Credit Hours)

Subjects	Credit Hours
1. Arts and Humanities	02
2. Natural Sciences	03
3. Social Sciences	02
4. Functional English	03
5. Expository Writing	03
6. Quantitative Reasoning (I and II)	06
7. Ideology and Constitution of Pakistan	02
8. Islamic Studies	02
9. Applications of Information and Communication Technologies (ICT)	03
10. Entrepreneurship	02
11. Civics and Community Engagement	02
Total	30

2. Interdisciplinary Courses (57 Credit Hours)

Subjects	Credit Hours
1. Basic Anatomy	03

2. Basic Physiology	03
3. General Pathology	03
4. Basic Biochemistry	03
Total	12

3. Field Experience (03 Credit Hours)

Subjects	Credit Hours
Internship/Field Experience	03

4. Capstone Project (03 Credit Hours)

Subjects	Credit Hours
Research Project	03

5. Majors

MAJOR SUBJECTS	
Courses	
72 Credit Hours (Minimum)	
Subject	Credit Hours
1. Gross and Imaging Anatomy-I	02+02
2. Gross and Imaging Anatomy-II	02+02
3. General Radiology-I	02+01
4. General Radiology-II	02+01
5. Pharmacology and clinical decision making in Imaging	03+00
6. Medicine	03+00
7. Neuroanatomy	02+01
8. Biostatistics	02+00
9. Contrast Media	02+00
10. Radiation Sciences for Technologist	03+00
11. Radiobiology & Radiation Protection	03+00
12. Ultrasound Physics and Instrumentation	02+01
13. Ultrasound & Doppler Imaging	02+02
14. MRI-I	02+01
15. MRI-II	02+02
16. Echocardiography	02+01
17. Mammography	02+01
18. Fluoroscopy & Special Radiological Techniques	02+01
19. Angiography & Interventional Radiology-I	02+01
20. Angiography & Interventional Radiology -II	02+01
21. Computed Tomography-I	02+01
22. Computed Tomography-II	02+02
23. Patient centered Care	01+02
24. Surgical Imaging	03+00
25. Imaging Informatics	00+02
26. Nuclear Medicine-I	02+01
27. Nuclear Medicine-II	02+02
28. Medical Physics	03+00

29. Scientific Inquiry & Research Methodology	02+01
Total	92

ELECTIVE SUBJECTS	
--- Courses	
Subject	Credit Hours
1. Advanced Ultrasound	01+01
2. Advanced computed Tomography	01+01
3. Advanced MRI	01+01
4. Advanced Nuclear Medicine	01+01

ENGLISH PROFICIENCY COURSES
12 Credit Hours

PERLs
08 Credit Hours

Note:

- Total Credit Hour in 4 years = 136
- This scheme of curriculum is also applicable to the annual system; in which two consecutive semesters will be considered as one professional year.

Credit hours distribution	
Theory	One credit hour shall be equal to one hour of teaching per week throughout the semester.
Practical / lab	One credit hour shall be equal to two hours of lab work per week throughout the semester.
Clinical	One credit hour shall be equal to three hours of clinical work per week throughout the semester.
Research	One credit hour shall be equal to three hours of research work per week throughout the semester.

SCHEME OF STUDIES

SEMESTER	COURE CODE	COURSE TITLE	THEORY	PRACTICAL	CREDIT HOURS
1st Semester	GEFE	Functional English	03	0	03
	GEQR-I	Quantitative Reasoning-I	03	0	03
	GENS	Natural Sciences	02	1	03
	GEAH	Arts & Humanities	02	0	02
	GEICP	Ideology & Constitution of Pakistan	02	0	02
	IDBB	Basic Biochemistry	03	0	03
	PERL-I	PERL-I	01	0	01
Total Credit Hours					17
2nd Semester	GEEW	Expository Writing	03	0	03
	GEQR-II	Quantitative Reasoning-II	03	0	03
	GESS	Social Sciences	02	0	02
	GEIE	Islamic Studies/Ethics	02	0	02
	IDBA	Basic Anatomy	03	0	03
	IDBP	Basic Physiology	03	0	03
		Medical Physics in MIT	03	0	03
	PERL-II	PERL-II	01	0	01
Total Credit Hours					20
3rd Semester	GEE	Entrepreneurship	02	0	02
	GECCM	Civics and Community Engagement	02	0	02
	GEICT	Fundamentals of ICT	02	1	03
	IDGP	General Pathology	03	0	03
	GIA-I	Gross and Imaging Anatomy-I	03	01	04
	GR-I	General Radiography-I	02	01	03
	EPC-I	English Proficiency-I	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					20
4th Semester	GIA-II	Gross and Imaging Anatomy-II	03	01	04
	GR-II	General Radiography-II	02	01	03
	RST	Radiation Sciences for Technologist	03	0	03
	PCD	Pharmacology and Clinical Decision making in Imaging	03	0	03
	MD	Medicine	03	0	03
	BS	Biostatistics	02	01	03
	EPC-2	English Proficiency-2	02	0	02
	PERL-IV	PERL-IV	01	0	01
Total Credit Hours					22

5th Semester	RRP	Radiobiology and radiation Protection	03	00	03
	NA	Neuroanatomy	02	01	03
	UPI	Ultrasound Physics and Instrumentation	02	01	03
	CM	Contrast Media	02	0	02
	MG	Mammography	02	01	03
	FSR	Fluoroscopy and Special Radiological Technique	02	01	03
	EPC-3	English Proficiency-3	02	0	02
	PERL-V	PERL-V	01	0	01
Total Credit Hours					20
6th Semester	ECG	Echocardiography	02	01	04
	SI	Surgical Imaging	02	01	03
	PCC	Patient Centered Care	01	01	02
	UDI	Ultrasound & Doppler Imaging	02	02	04
	II	Imaging Informatics	02	01	03
	AIR-I	Angiography and Interventional radiology-I	02	01	03
	EPC-4	English Proficiency-4	02	0	02
	PERL-VI	PERL-VI	01	0	01
Total Credit Hours					22
7th Semester	AIR-II	Angiography and Interventional Radiology-II	02	01	03
	CT-I	Computed Tomography-I	02	01	03
	MRI-I	Magnetic Resonance Imaging I	02	01	03
	NM-I	Nuclear Medicine-I	02	01	03
	SIRM	Scientific Inquiry & Research Methodology	02	01	03
	Int.	Internship/Field Experience	00	03	03
	EPC-5	English Proficiency-5	02	0	02
	PERL-VII	PERL-VII	01	0	01
Total Credit Hours					21
8th Semester	NM-II	Nuclear Medicine-II	02	02	04
	MRI-II	Magnetic Resonance Imaging-II	02	02	04
	CT-II	Computed Tomography-II	02	02	04
	Res.	Research Project	00	03	03
	ES	Elective Subject	01	01	02
	EPC-6	English Proficiency-6	02	0	02
	PERL-VIII	PERL-VIII	01	0	01
Total Credit Hours					20

MAJOR COURSE

MEDICAL PHYSICS IN MIT (03+0)

Course Objectives

1. Develop basic understanding of medical physics concepts,
2. Develop problem-solving and critical-thinking skills,
3. Learn to integrate and apply various physics concepts to a single problem,
4. Develop scientific communication skills.

Learning Objectives

1. Describe an imaging system and break it down into its components and physical principles, for each of the imaging modalities covered
2. Identify the key factors that affect image quality and address these factors for the different imaging modalities;
3. Learn to communicate the physical principles behind medical technology, radiation safety, and relevant applications.

Table of Specification:

Course Content:	MCQs	SEQs
I. Radiologic physics <ol style="list-style-type: none"> i. Concepts of Radiation ii. Nature of surroundings iii. Sources of Ionizing Radiation iv. Discovery of X-rays v. Development of Modern Radiology 	4	1
II. Electricity <ol style="list-style-type: none"> i. Electric to Electromagnetic Energy ii. Electrostatics iii. Electrodynamics 	5	1
III. Magnetism <ol style="list-style-type: none"> i. Electromagnetism ii. Electromagnetic Effects iii. Electromagnetic Induction iv. Electric Generators and Motors v. The Transformer vi. Rectification 	5	1
IV. Waves and Oscillation V. Radioactivity <ol style="list-style-type: none"> i. Types of Ionizing Radiation ii. Electromagnetic Radiation 	7	1

iii. Photons Everywhere iv. Electromagnetic Spectrum v. Energy and Matter,		
VI. Medical physics and imaging principles: intensity, resolution, contrast	5	1
VII. X-ray Interaction with Matter i. Five Basic Interactions ii. Differential Absorption iii. Contrast Examinations iv. Exponential Attenuation	6	1
VIII. Ultrasound physics i. Waves ii. Reflection, transmission, attenuation, iii. Transducers, ultrasonic transducers,	4	1
IX. Nuclear magnetic resonance physics: magnetic moment, magnetization, relaxation	4	1
X. X-ray imaging, X-ray production & detection	5	1
XI. Radiation exposure principles: safety, risk, radiation protection, Basic Radiation Protection		
XII. PNRA guidelines		
Total	45	09

Recommended Books:

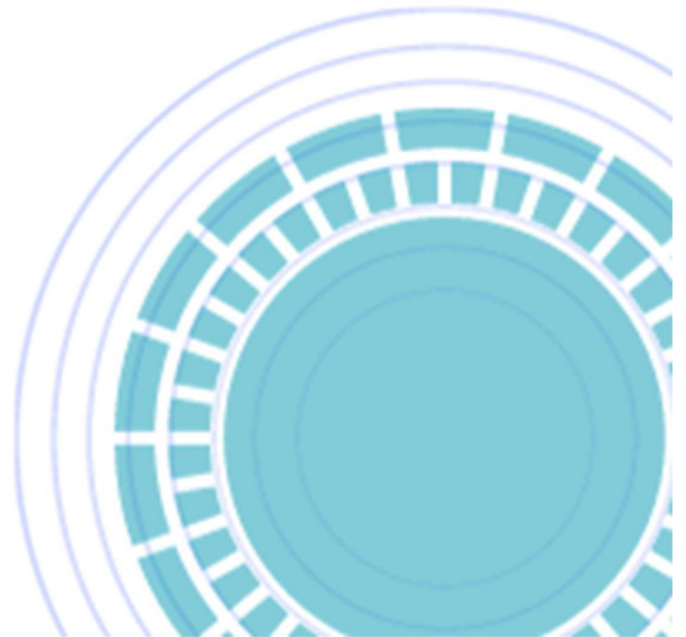
1. "Radiologic Science for Technologists. Physics, Biology, and Protection". 12th Edition - July 22, 2020. Author: Stewart C. Bushong. Hardback ISBN: 9780323749558.
2. "Medical Imaging Physics", by W.R. Hendee and E.R. Ritenour, ISBN 0471382264; available in The Book Store at Western
3. "Physics of Radiology", A.B. Wolbarst, ISBN 0838557694, UWO Library
4. "The Essential Physics of Medical Imaging", J.T. Bushberg, et al., ISBN 0683301187, UWO Library



**Allied Health Sciences
Curricula 2024**



**BS MEDICAL
LABORATORY
TECHNOLOGY
CURRICULUM**



BS MEDICAL LABORATORY TECHNOLOGY

Basic Layout for all Curriculum

1. Introduction To Program:

BS Medical Laboratory Technology (MLT) is an Undergraduate Program by University of Health Sciences is an Allied Health specialty concerned with the diagnosis, treatment and prevention of diseases through the use of clinical laboratory tests. MLT is a vital component of modern healthcare. The work of medical laboratory technologists directly impacts patient outcomes, and their dedication to providing accurate and reliable laboratory results is essential for the effective functioning of the healthcare system. In fact, the practice of modern medicine depends on the laboratory technology so these graduates of MLT will play vital role in medical field.

2. Aims of the Program

Aim of the Program is to produce medical laboratory professionals that will play a critical role in laboratory diagnosis and collecting the information required to give the best care to patients.

3. Objectives of the Program

The Bachelor of Science in Medical Laboratory Technology program offered by UHS is designed to prepare UHS graduates to enter the workforce as competent and skilled medical laboratory professionals, contributing to the diagnosis, treatment, and prevention of diseases through laboratory testing

4. Learning Outcomes of the Program

The learning outcomes of a Bachelor of Science in Medical Laboratory Technology (MLT) program typically cover a range of knowledge, skills, and competencies that prepare students for a successful career in the field. The specific learning outcomes of MLT program offered by UHS are,

I. Core Knowledge:

Demonstrate a comprehensive understanding of the principles and theories underlying medical laboratory science, including anatomy, physiology, biochemistry, and microbiology.

II. Laboratory Techniques:

Develop proficiency in performing a variety of laboratory tests and techniques, including but not limited to hematology, clinical chemistry, microbiology, immunology, and molecular diagnostics.

III. Instrumentation and Technology:

Gain hands-on experience with modern laboratory equipment, automation, and technology used in diagnostic testing. This includes the ability to operate and troubleshoot laboratory instruments.

IV. Specimen Collection and Processing:

Learn proper techniques for collecting, handling, and processing various biological specimens, ensuring the accuracy and integrity of laboratory results.

V. Quality Assurance and Control:

Understand and apply principles of quality assurance and quality control in the laboratory setting to maintain the accuracy, precision, and reliability of test results.

VI. Ethical and Professional Practices:

Demonstrate ethical behavior and adhere to professional standards and regulations in the practice of medical laboratory technology. Understand the importance of patient confidentiality and privacy.

VII. Critical Thinking and Problem-Solving:

Develop the ability to critically analyze laboratory data, interpret results, and troubleshoot issues that may arise during testing. Apply problem-solving skills to address challenges in the laboratory setting.

VIII. Communication Skills:

Effectively communicate laboratory findings verbally and in writing to healthcare professionals, colleagues, and patients. Develop interpersonal skills for collaborative work within the healthcare team.

IX. Safety Protocols:

Adhere to strict safety protocols and practices in the laboratory environment, ensuring the well-being of oneself, colleagues, and patients.

X. Continuing Education and Professional Development:

Recognize the importance of lifelong learning and stay abreast of advances in medical laboratory science. Pursue opportunities for continuing education and professional development to enhance knowledge and skills.

XI. Clinical Experience:

Gain practical experience through clinical rotations or internships in real-world healthcare settings. Apply theoretical knowledge to actual patient care scenarios and develop competence in performing laboratory tests under supervision.

XII. Research Literacy:

Develop an understanding of research methods and the ability to critically evaluate scientific literature. Some programs may include opportunities for students to engage in research projects.

These learning outcomes collectively will prepare UHS graduates of an MLT program to enter the workforce as competent and skilled medical laboratory professionals, contributing to the diagnosis, treatment, and prevention of diseases through laboratory testing

5. Career Opportunities of the Graduates

Clinical Laboratory Technologist/Technician, Blood Bank Technologist, Microbiology Technologist, Molecular Diagnostics Technologist, Vaccine and Pharma industry, Research Positions, Quality Assurance/Control,

6. Program Details :128 Credit Hours

Sr. No.	Subjects	No of Courses	Credit Hours
1	General Subjects	11	30
2	Interdisciplinary Subjects	4	12
3	Major Subjects	25	85
4	Capstone Project: Internship/Field Experience:	2	06
	Total	42	133

7. Clinical Portfolio Requirements (e.g., Log Books)

Log Books will be mandatory for all Lab, Practical and clinical rotation subjects

8. Assessment (Formative and Summative)

Both Formative and Summative

9. Table of Specifications

TOS of each subject theory and practical are given in details with each subject

10. Program Structure

GENERAL SUBJECT	
11 Courses (30 Credit Hours)	
Subject	Credit Hours
1. Arts and Humanities	02+0
2. Natural Sciences	02+01
3. Social Sciences	02+0
4. Functional English	03+0
5. Expository Writing	03+0
6. Quantitative Reasoning (I and II)	06 (2x03)
7. Ideology and Constitution of Pakistan	02+0
8. Islamic Studies	02+0
9. Applications of Information and Communication Technologies	02+01
10. Entrepreneurship	02+0

11. Civics and Community Engagement	02+0
INTERDISCIPLINARY SUBJECTS	
Subject	Credit Hours
1. General Pathology	03+0
2. Basic Anatomy	03+0
3. Basic Biochemistry	03+0
4. Basic Physiology	03+0
ENGLISH PROFICIENCY COURSES (12 Credit Hours)	
PERLs (08 Credit Hours)	
MAJOR SUBJECTS	
25 Courses 86 Credit Hours (Minimum 72)	
Subject	Credit Hours
1. Histopathology-I	03+01
2. Histopathology-II	03+01
3. Histopathology-III	02+02
4. Hematology-I	03+01
5. Hematology-II	03+01
6. Hematology-III	03+01
7. Chemical Pathology-I	03+01
8. Chemical Pathology-II	03+01
9. Chemical Pathology-III	03+01
10. Microbiology-I	02+01
11. Microbiology-II	02+01
12. Microbiology-III	02+01
13. Microbiology-IV	02+01
14. Blood Banking (Blood Transfusion)	02+01
15. Basic Immunology and Serology	02+01
16. Advance Immunology	02+01
17. Basic Molecular Biology	02+01
18. Molecular Biology and Genetics	03+01
19. Molecular Pathology & Cytogenetics	03+01
20. Basic Laboratory Instrumentations	02+01
21. Biostatistics	03+0
22. Research Methodology	03+0
23. Biosafety and Risk management	03+0
24. Quality control and assurance	03+0
25. PERLS (Professional Ethics)	03+0
Total	85
CAPSTONE PROJECT 03 Credit Hours	
INTERNSHIP/ FIELD EXPERIENCE 03 Credit Hours	

SCHEME OF STUDIES

SEMESTER	COURSE CODE	COURSE TITLE	THEORY	PRACTICAL	CREDIT HOURS 128
1st Semester	GEFE	Functional English	03	0	03
	GEQR	Quantitative Reasoning-I	03	0	03
	GENS	Natural Sciences	02	1	03
	GEAH	Arts and Humanities	02	0	02
	GEICP	Ideology and Constitution of Pakistan	02	0	02
	IDC	Basic Biochemistry	03	0	03
	PERL-I	PERL-I	01	0	01
Total Credit Hours					17
2nd Semester	GEEW	Expository Writing	03	0	03
	GEQR	Quantitative Reasoning-II	03	0	03
	GESS	Social Sciences	02	0	02
	GEIE	Islamic Studies/Ethics	02	0	02
	BAN	Basic Anatomy	03	0	03
	BPH	Basic Physiology	03	0	03
	BLI	Basic Lab instrumentation	02	01	03
	PERL-II	PERL-II	01	0	01
Total Credit Hours					20
3rd Semester	GEE	Entrepreneurship	02	0	02
	GECCM	Civics and Community Engagement	02	0	02
	GEICT	Fundamentals of ICT (Computer Sciences)	02	1	03
	GPA	Gen Pathology	03	0	03
	HP-I	Histopathology -I	03	1	04
	HM-I	Hematology-I	03	1	04
	EPC-1	English Proficiency 1	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					21
4th Semester	HP-II	Histopathology -II	03	1	04
	HM-II	Hematology-II	03	1	04
	Mic-I	Microbiology -1 Basic Bacteriology	02	1	03
	CP-I	Chemical Pathology-I	03	1	04
	BMB	Basic Molecular Biology	02	0	02
	EPC-2	English Proficiency 2	02	0	02
	PERL-IV	PERL-IV	01	0	01

Total Credit Hours					20
5th Semester	HP-III	Histopathology III	02	02	04
	HM-III	Hematology III	03	01	04
	Mic-II	Microbiology II	02	01	03
	CP-II	Chemical Pathology II	03	01	04
	BIS	Basic Immunology and Serology	02	01	03
	EPC-3	English Proficiency 3	02	0	02
	PERL-V	PERL-V	01	0	01
Total Credit Hours					21
6th Semester	Mic-III	Microbiology III	02	1	03
	CP-III	Chemical Pathology III	03	01	04
	MBG	Molecular Biology and Genetics	03	01	04
	BB	Blood Banking (Transfusion Medicine)	02	01	03
	AI	Advance Immunology	02	01	03
	EPC-4	English Proficiency 4	02	0	02
	PERL-VI	PERL-VI	01	0	01
Total Credit Hours					20
7th Semester	Mic-IV	Microbiology IV	02	1	03
	MPC	Molecular Pathology and Cytogenetics	03	1	04
	Ent	Entrepreneurship	02	0	02
	BS	Biostatistics	03	0	03
		Internship/Field Experience	03	0	03
	EPC-4	English Proficiency 4	02	0	02
	PERLVI	PERL-VI	01	0	01
Total Credit Hours					18
8th Semester	QCA	Quality control and Accreditation	03	0	03
	RM	Research Methodology	03	0	03
	BRM	Biosafety and Risk management	02	01	03
	CP	Capstone Project	0	03	03
	EPC-4	English Proficiency 4	02	0	02
	PERLVI	PERL-VI	01	0	01
Total Credit Hours					15

MAJOR COURSES

BASIC LABORATORY INSTRUMENTATION

Credit Hour 3 (2+1)

Learning Objectives:

At the end of the course, student will be able to

1. Understand the use of basic laboratory techniques and instruments

Course Content:	MCQs	SEQs
I. General Labware i. Glassware and Plasticware ii. Bottles iii. Test tubes iv. Graduated Cylinders v. Flasks vi. Cleaning and care of Labware vii. Safety Precautions of Labware	2	1
II. Water purification techniques i. Distillation ii. Deionization iii. Reverse osmosis	3	1
III. Pipettes i. Types of Pipettes ii. Glass pipettes and Micropipettes iii. Calibration of pipettes	5	1
IV. Centrifuge i. Principle of centrifugation ii. Types iii. Quality control	5	1
V. Analytical Balances i. Principle of analytical balances ii. Types iii. Quality control	5	1
VI. Autoclaves	2	0
VII. pH Meter	3	1
VIII. Temperature controlled Equipment i. Ovens ii. Incubators iii. Water Bath iv. Refrigerator and Freezers	3	0
IX. Spectrophotometer i. Derivation of Beer-Lambert Law ii. Application of Beer-Lambert Law iii. Principle of Spectrophotometer iv. Components of Spectrophotometer v. Quality Control of Spectrophotometer	7	1
X. Microscopy	5	1

i. Types of microscopes		
ii. Principal and working of light microscope		
iii. Components of light microscope		

Practical:

List of Practical:	No. of OSPEs
I. Water purification techniques	03
II. Pipettes	
III. Centrifuge	
IV. Analytical Balances	
V. Autoclaves	
VI. pH Meter	
VII. Temperature controlled Equipment	
VIII. Spectrophotometer	
IX. Microscopy	

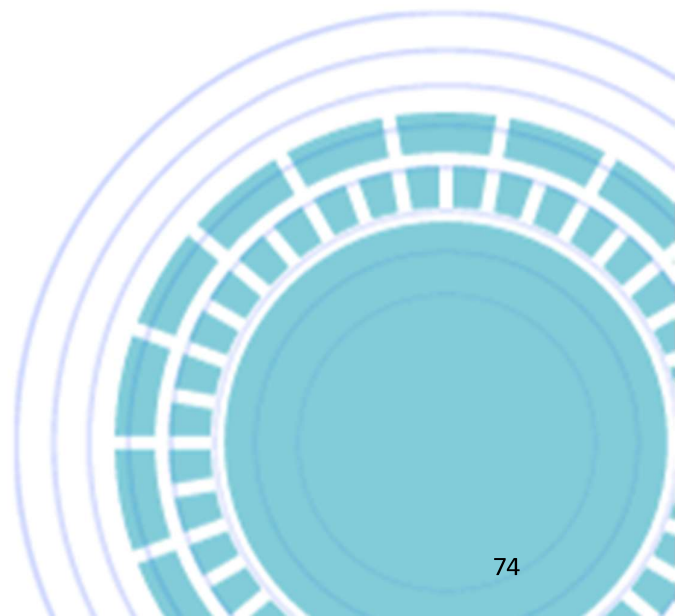
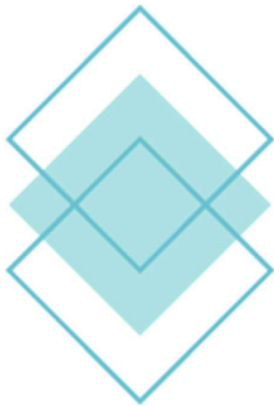
Recommended Books

1. "Basic Clinical Laboratory Techniques" by Barbara H. Estridge Anna P. Reynolds
6th Edition (2012).
2. "Clinical Chemistry: Principles, Procedures, Correlations" by Michael L. Bishop,
Edward P. Fody, Larry E. Schoeff Publisher: Lippincott Williams & Wilkins; 7th
Edition (2013).



**Allied Health Sciences
Curricula 2024**

**BS NUTRITION
CURRICULUM**



BS NUTRITION

Human nutrition and dietetics are indispensable in the pursuit of public health and individual wellness as they serve as the cornerstones of optimizing human health. These disciplines provide the knowledge and expertise needed to understand the intricate interplay between dietary choices and well-being. Through evidence-based practices, they pay to the prevention and management of a myriad of health conditions, thus reducing the burden on healthcare systems. Furthermore, they empower individuals to make informed dietary decisions, ultimately promoting longevity and an improved quality of life.

Regrettably, the oversight of this critical sector in developing nations such as Pakistan has had detrimental consequences on the health of individuals across all age groups. The potential of nutrition and dietetics in preventing and managing diseases remains vastly untapped, primarily due to the absence of this essential discipline within the country. Recognizing the fundamental importance and extensive scope of these fields, the University of Health Sciences is poised to introduce a four-year degree program, "B.S. (Hons.) Nutrition & Dietetics. This program will provide students with a distinctive and influential career trajectory, enabling them to make substantial contributions to both individual and societal well-being in a continually evolving realm of health and nutrition.

AIM

The overarching goal of the BS Nutrition and Dietetics program is to empower students with comprehensive professional knowledge, practical skills, advanced techniques, and a strong ethical foundation. This will equip them to function effectively within the healthcare ecosystem, bridging the gap between medical professionals and patients to enhance the efficiency and quality of healthcare service delivery.

OBJECTIVES

The objectives of the BS Nutrition and Dietetics Program are to educate students to attain the following:

Precision and Ethical Proficiency: To Cultivate a commitment to accuracy and meticulousness, promoting high ethical standards and technical excellence.

Skill Evaluation: To Develop the capacity to assess both technical and non-technical competencies within a standardized and reproducible context.

Decision-Making: To Enhance decision-making abilities and the aptitude for sound judgment, particularly in high-pressure situations.

Leadership and Problem-Solving: To Nurture leadership qualities and effective problem-solving and administrative skills, preparing students for leadership roles in healthcare.

Communication Innovation: To Encourage the development and analysis of innovative strategies for effective communication with both patients and healthcare professionals.

Interdisciplinary Collaboration: To Demonstrate the ability to build interdisciplinary teams, facilitating seamless coordination among various Allied Health Disciplines.

Professional Conduct: To Exhibit an understanding of fundamental concepts of professional behavior and grasp the legal implications of their role within the work environment.

Healthcare Role Awareness: To Understand their place and significance within the healthcare delivery system.

Continuing Education: To Establish and sustain a commitment to continuing education as an essential component of professional growth and competence maintenance.

LEARNING OUTCOME

The learning outcomes of this program typically include:

1. Understanding of Nutrition Science:

Knowledge of macronutrients, micronutrients, digestion, metabolism, and their roles in human health and disease.

2. Dietary Assessment and Planning:

Proficiency in assessing individuals' dietary needs and developing appropriate nutrition plans to promote health and address specific conditions or requirements.

3. Food and Nutrition Policy:

Awareness of policies and regulations related to food safety, food labeling, public health, and nutrition guidelines.

4. Clinical Nutrition and Therapeutics:

Competence in providing nutritional therapy for various health conditions and diseases, and understanding how nutrition impacts the management and treatment of illnesses.

5. Community and Public Health Nutrition:

Knowledge and skills to design and implement nutrition education programs, and promote healthful behaviors in communities and populations.

6. Research and Critical Thinking:

Ability to critically evaluate scientific research, design experiments, and contribute to advancements in nutrition science through evidence-based practice.

7. Professional Communication and Ethics:

Effective communication skills for interacting with clients, healthcare teams, and the public, while adhering to ethical standards and professional conduct in the field.

8. Cultural Competence:

Awareness and understanding of diverse cultural practices and beliefs related to food and nutrition, and the ability to tailor nutrition advice accordingly.

9. Lifelong Learning and Professional Development:

Cultivation of a mindset for continuous learning and keeping up-to-date with advancements in nutrition science and related fields.

CARRIER OPPORTUNITIES OF THE GRADUATES

Upon graduation, our students will showcase their expertise across various domains:

Clinical Dietitians: They will excel in hospitals and private clinics, offering medical nutrition therapy and expert nutritional counseling to patients.

Community Nutritionists: Our graduates will collaborate with national and international organizations, playing a pivotal role in educating and raising awareness about healthy dietary practices in rural areas. Their efforts will contribute to the prevention of nutritional diseases and the promotion of public health.

Nutrition Specialists: They will serve public and private sector organizations, specializing in the field of nutrition supplements to enhance the well-being of individuals.

Nutrition Supervisors: Our alumni will take charge as nutrition supervisors in basic health units across different districts of Punjab, ensuring that communities have access to proper nutritional guidance and support.

Nutrition Officers and Researchers: They will assume roles as nutrition officers and researchers within the health department's nutrition division, contributing to evidence-based policies and programs aimed at improving public health.

Educators: They will impart their knowledge and expertise as course instructors in education institutions, fostering the next generation of nutrition and dietetics professional

Structure of Program

Sr.	Courses	No. of Courses	Credit Hours
1	General Education Courses	11	30
2.	Interdisciplinary Courses	04	12
3.	Major Courses	27	81
4.	Elective Courses	2	6
5.	Capstone project	-	03
6.	Internship	-	03
		Total	135

GENERAL SUBJECT	
12 Courses	
30 Credit Hours	
Subject	Credit Hours
1. Arts and Humanities	02+0
2. Natural Sciences	02+01
3. Social Sciences	02+0
4. Functional English	03+0
5. Expository Writing	03+0
6. Quantitative Reasoning (I and II)	06 (2x03)
7. Ideology and Constitution of Pakistan	02+0
8. Islamic Studies	02+0
9. Applications of Information and Communication Technologies (ICT)	02+01
10. Entrepreneurship	02+0
11. Civics and Community Engagement	02+0

INTERDISCIPLINARY SUBJECTS	
04 Courses	
12 Credit Hours	
Subject	Credit Hours
1. General Pathology	03+0
2. Basic Anatomy	03+0
3. Basic Biochemistry	03+0
4. Basic Physiology	03+0

12 Credit Hours
ENGLISH PROFICIENCY COURSES

PERLs
08 Credit Hours

MAJOR COURSES	
Courses (27)	
Credit Hours (81)	
Subject	Cr. Hrs.
1. Fundamentals of Human Nutrition	3(3-0)
2. Introduction to Food Science and Technology	3(2-1)
3. Food Microbiology	3(2-1)
4. Macronutrients in Human Nutrition	3(3-0)
5. Micronutrients in Human Nutrition	3(3-0)
6. Principles of Nutritional Assessment	3(2-1)
7. Nutrition through Lifecycle	3(3-0)
8. Fundamentals of Food Service Management	3(2-1)
9. Functional Foods & Nutraceuticals	3(2-1)
10. Clinical Nutrition – I	3(2-1)
11. Clinical Nutrition – II	3(2-1)
12. Hospital Dietetics	3(2-1)
13. Nutritional Immunology	3(3-0)
14. Medical Nutrition Therapy-I	3(2-1)
15. Drug Nutrient Interaction	3(3-0)
16. Medical Nutrition Therapy- II	3(2-1)
17. Clinical Aspects of Sports Nutrition	3(3-0)
18. Research Methodology in Nutrition	3(2-1)
19. Nutritional Practices in Critical Care	3(2-1)
20. Basics of Nutrigenomics and Proteomics	3(2-1)
21. Nutritional Counselling Skills	3(2-1)
22. Public Health Nutrition	3(3-0)
23. Recent Advances in Nutrition	3(2-1)
24. Nutrition and Biotechnology	3(2-1)
25. Food Laws & Regulations	3(3-0)

26. Nutrition and Psychology	3(3-0)
27. Food Toxicology and Additives	3(2-1)

CAPSTONE PROJECT
03 Credit Hours

INTERNSHIP/ FIELD EXPERIENCE
03 Credit Hours

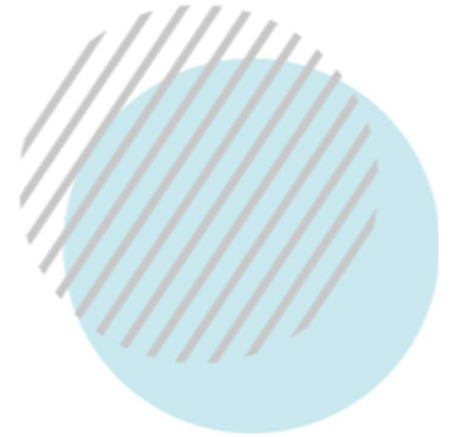
ELECTIVE COURSES	
Any 02 Courses	
Total 6 Credit Hours	
Subject	Cr. Hrs.
1. Community Pediatrics	3(3-0)
2. Reproductive Health	3(3-0)
3. Health Professional Education	3(3-0)
4. Health Policy and Management	3(3-0)

SCHEME OF STUDIES

SEMESTER	COURSE CODE	COURSE TITLE	THEORY	PRACTICAL	CREDIT HOURS
1 st Semester	GEFE	Functional English	03	0	03
	GEQR	Quantitative Reasoning-I	03	0	03
	GENS	Natural Sciences	02	1	03
	GEAH	Arts and Humanities	02	0	02
	GEICP	Ideology and Constitution of Pakistan	02	0	02
	IDC	Basic Biochemistry	03	0	03
	PERL-I	PERL-I	01	0	01
Total Credit Hours					17
2 nd Semester	GEEW	Expository Writing	03	0	03
	GEQR	Quantitative Reasoning-II	03	0	03
	GESS	Social Sciences	02	0	02
	GEIE	Islamic Studies/Ethics	02	0	02
	IDC	Basic Anatomy	03	0	03
	IDC	Basic Physiology	03	0	03
	PERL-II	PERL-II	01	0	01
Total Credit Hours					17
3 rd Semester	GEE	Entrepreneurship	02	0	02
	GECCM	Citizenship Education and Community Engagement	02	0	02
	GEICT	Applications of Information and Communication Technologies (ICT)	02	1	03
	IDC	General Pathology	03	0	03
	MFHN	Fundamentals of Human Nutrition	03	0	03
	MFST	Introduction to Food Science and Technology	02	01	03
	EPC-1	English Proficiency-1	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					19
4 th Semester	MMA	Macronutrients in Human Nutrition	03	0	03
	MFM	Food Microbiology	02	01	03
	MMI	Micronutrients in Human Nutrition	03	00	03

	MPNA	Principles of Nutritional Assessment	02	01	03
	MNL	Nutrition through Lifecycle	03	00	03
	MFSM	Fundamentals of Food Service Management	02	01	03
	EPC-2	English Proficiency-2	02	0	02
	PERL-IV	PERL-IV	01	0	01
Total Credit Hours					21
5 th Semester	MFFN	Functional Foods & Nutraceutical	02	01	03
	MCN-I	Clinical Nutrition-I	02	01	03
	MHD	Hospital Dietetics	02	01	03
	MNI	Nutritional Immunology	03	00	03
	MNT-I	Medical Nutrition Therapy-I	02	01	03
	MDNI	Drug Nutrient Interaction	03	00	03
	EPC-3	English Proficiency-3	02	0	02
	PERL-V	PERL-V	01	0	01
Total Credit Hours					21
6 th Semester	EL-1	Elective 1	03	0	03
	MCN-II	Clinical Nutrition – II	02	01	03
	MRMN	Research Methodology in Nutrition	02	01	03
	EL-2	Elective 2	03	00	03
	MNT-II	Medical Nutrition Therapy- II	02	01	03
	MCASN	Clinical Aspects of Sports Nutrition	03	00	03
	EPC-4	English Proficiency-4	02	0	02
	PERL-VI	PERL-VI	01	0	01
Total Credit Hours					21
7 th Semester	MFLR	Food laws & Regulations	03	00	03
	MNPCC	Nutritional Practices in Critical Care	02	01	03
	MBNP	Basics of Nutrigenomics and Proteomics	02	01	03
	MRAND	Recent Advances in Nutrition & dietetics	02	01	03
	MNCS	Nutritional Counselling Skills	02	01	03
	INT	Internship/Field Experience	03	0	03
	EPC-5	English Proficiency-5	02	0	02

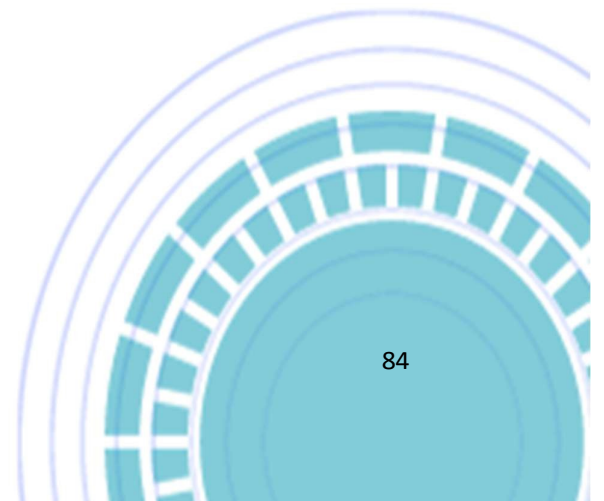
	PERL-VII	PERL-VII	01	0	01
Total Credit Hours					21
8th Semester	MPHN	Public Health Nutrition	03	00	03
	MBND	Biotechnology in Nutrition and Dietetics	02	01	03
	MNP	Nutrition and Psychology	03	0	03
	MFTA	Food Toxicology and Additives	02	1	03
	EPC-6	English Proficiency-6	02	0	02
	PERL-VIII	PERL-VIII	01	0	01
	CAP	Cap-stone Project	03		03
Total Credit Hours					21



**Allied Health Sciences
Curricula 2024**



**BS. OCCUPATIONAL
THERAPY
CURRICULUM**



BS OCCUPATIONAL THERAPY

1. Introduction to Program

This program is influenced by the understanding that health extends beyond the absence of disease and humans are occupational beings whose health and wellness can be impacted by the occupations they participate and engage in. Occupations are at the center, with person- occupation-environment relationship as the hub of occupational therapy interventions

2. Aims of the Program

The purpose of the 4-year degree program in Occupational Therapy is to equip students with essential professional knowledge, skills and attitudes to enable them for competent, evidence-based occupational therapy practice.

Objectives of the Program

As per the Minimum Standards of the Education of Occupational Therapists (Revised 2016) by the World Federation of Occupational Therapists (WFOT), an occupational therapy program should enable the student knowledge, skills and attitudes in the following six areas of competence

1. Person-Occupation-Environment relationship and its relationship to health
2. Therapeutic and professional relationships
3. An occupational therapy process
4. Professional reasoning and behavior
5. The context of private practice
6. The application of evidence to ensure best practice



FIGURE 3: ESSENTIAL AREAS OF KNOWLEDGE, SKILLS AND ATTITUDES FOR COMPETENT PRACTICE AT THE GRADUATE LEVEL

- To provide at an undergraduate level, education and clinical/professional training which involves research and clinical practice, uses a variety of teaching and learning methods including self-directed learning, and integrates the development of theoretical knowledge with clinical skills across a wide range of patients
- To develop student learning and academic skills over four years thereby promoting continuing professional development and lifelong learning.

- To enable students to meet the requirements of the relevant professional and statutory bodies.
- To foster the development of professional knowledge and clinical skills across a wide range of patients presenting communication difficulties and to meet the clinical placement requirements of different hospitals.
- To provide opportunities for self-monitoring and personal development for the formation of reflective practitioners
- To produce professionals who are capable of applying theoretical knowledge to the diagnostic, therapeutic, educative and technical roles of the Occupational Therapists within the healthcare, educational and social welfare sectors.
- To educate students and promote change towards an inclusive society through principles of respect, tolerance, and recognition.

Learning Outcomes of the Program

Aligning with the WFOT *Minimum Standards of the Education of Occupational Therapists (Revised 2016)*, the B.Sc. (Hons.) Occupational Therapy program provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A. Knowledge and Understanding

Student should gain knowledge about the principles of rehabilitation and know details of the role of occupation therapy in a disease.

Student should acquire skills in analyzing and assessing patient's needs, abilities and general function.

Student should learn how to assess, manage and prevent the problems which affect activities or tasks in the occupations of self-care, work and leisure.

Student should learn to make use of purposeful activity with individuals who are limited by disability for maximizing independence and preventing disability

Student should develop understanding of perceptual-motor skills and sensory integrative functioning.

Student should be able to design, analyze, select and use adaptive equipment and devices according to the needs of the disabled.

Student can administer and interpret tests required for therapeutic purposes.

Student can train patients to build their confidence to tackle such tasks as feeding themselves, washing, dressing, walking, crossing roads or using public transport

B. Values and Attitudes

Student can demonstrate awareness of and sensitivity to human diversity, including differences of culture, ethnicity, language disability, socio-economic status, etc.

Student can maintain the principles and practices of patient confidentiality.

Student can maintain the principles of the professional and statutory regulatory bodies.

Student demonstrates adherence to the professional code of conduct within the legal and ethical framework.

Student can recognise the obligation to maintain fitness for practice and the need for continuing personal and professional development.

C. Cognitive/Intellectual

Student can study independently using a variety of media including the Internet. Student can critically evaluate evidence to support clinical practice.

Student can synthesize information from a range of sources and utilize for a given

purpose.

Student has the ability to ask clinical questions, formulate hypotheses and develop research.

Student has the ability to use feedback to change learning and practice.

D. Subject Specific

Student has the ability to design and deliver patient centered & in case of children family intervention of an acceptable quality.

Student has the ability to draw on knowledge and skills in order to make professionally reasoned judgments and apply within the scope of the individual's practice.

Student has the ability to communicate effectively with patients, significant others and other relevant parties.

Student has the ability to address wider service issues including aspects of administration, case management.

Student is able to reflect on own professional practice and to use supervision and other learning opportunities to advance professional development.

E. Communication & Teamwork

- Student can communicate using multiple media, including verbal, written, presentation, word processing and internet- based communication.
- Student can manage workload, prioritizing as appropriate, within a time frame.
- Student can pursue independent learning for the advancement of knowledge and skills.
- Student is able to work collaboratively with others and within a team.
- Student can take responsibility and execute duties in a professional manner.
- Students should be able to organize recreational and cultural activities that help as techniques to resolve the disabilities and problems of individuals with physical and mental challenges.

Career Opportunities of the Graduates

Upon successful completion of the course, the graduate will be awarded a degree in Allied Health Sciences by the UHS and will be able to pursue a clinical, research-oriented, or academic-based career.

A graduate of the four-year B.Sc. (Hons.) Occupational Therapy program can work in the following capacities

- As a clinical occupational therapist
- As a school-based occupational therapist
- As a case manager or in disability management
- As a mental health clinician
- As a pediatric rehabilitation specialist
- As an educator (position of demonstrator/lecturer/senior lecturer to be based on experience)
- As a researcher
- As a health administrator

Program Structure

GENERAL SUBJECT	
11 Courses	
30 Credit Hours	
Subject	Credit Hours
1. Arts and Humanities	02+0
2. Natural Sciences	02+01
3. Social Sciences	02+0
4. Functional English	03+0
5. Expository Writing	03+0
6. Quantitative Reasoning (I and II)	06 (2x03)
7. Ideology and Constitution of Pakistan	02+0
8. Islamic Studies	02+0
9. Applications of Information and Communication Technologies (ICT)	02+01
10. Entrepreneurship	02+0
11. Civics and Community Engagement	02+0

INTERDISCIPLINARY SUBJECTS	
04 Courses	
12 Credit Hours	
Subject	Credit Hours
1. General Pathology	03+0
2. Basic Anatomy	03+0
3. Basic Biochemistry	03+0
4. Basic Physiology	03+0

MAJOR SUBJECTS	
29 Courses	
80 Credit Hours	
Subject	Credit Hours
1. Fundamentals of occupational therapy	2
2. Occupational therapy theories & approaches	2
3. Neuro anatomy	3
4. Neuro physiology	3
5. Community based medicine rehabilitation & occupational health	3
6. Developmental paediatrics	3
7. Occupational therapy in dev paediatrics	3
8. Kinesiology & biomechanics (goniometry / manual muscle testing)	4
9. Activities of daily livings	3
10. Medicine-i	3
11. Surgery –i	3
12. Occupational therapy in orthopedics and surgical conditions	3
13. Occupational therapeutics	3
14. Orthotics , prosthetics & assistive technologies	3

15. Medicine-ii	3
16. Surgery –ii	3
17. Occupational therapy in cardiac and pulmonary diseases	3
18. Occupational therapy in critical care, visual and hearing impaired, burns & oncology	3
19. First aid , cpr & crisis intervention managment	2
20. PROFESSIONAL ETHICS of Occupational Therapy	2
21. Hand rehabilitation & splinting	2
22. Psychiatry	3
23. Occupational therapy in mental health	4
24. Ergonomics & vocational rehabilitation	4
25. Evidence based ot practice	2
26. Organization, administration & work study in occupational therapy	2
27. Sensory integration therapy	3
28. Therapeutic activities & exercises	3
Total	80

CAPSTONE PROJECT
03 Credit Hours

INTERNSHIP/ FIELD EXPERIENCE
03 Credit Hours

ENGLISH PROFICIENCY COURSES
12 Credit Hours

PERLs
08 Credit Hours

SCHEME OF STUDIES

SEMESTER	COURSE CODE	COURSE TITLE	THEOR Y	PRACTICAL	CREDIT HOURS
1 st Semester	GEFE	FUNCTIONAL ENGLISH	03	0	03
	GEQR	QUANTITATIVE REASONING-I	03	0	03
	GENS	NATURAL SCIENCES	02	1	03
	GEAH	ARTS AND HUMANITIES	02	0	02
	GEICP	IDEOLOGY AND CONSTITUTION OF PAKISTAN	02	0	02
	IDC	BASIC BIOCHEMISTRY	03	0	03
	PERL-I	PERL-I	01	0	01
Total Credit Hours					17
2 nd Semester	GEEW	EXPOSITORY WRITING	03	0	03
	GEQR	QUANTITATIVE REASONING-II	03	0	03
	GESS	SOCIAL SCIENCES	02	0	02
	GEIE	ISLAMIC STUDIES/ETHICS	02	0	02
	BAN	BASIC ANATOMY	03	0	03
	BPH	BASIC PHYSIOLOGY	03	0	03
	BOT 107	FUNDAMENTALS OF OCCUPATIONAL THERAPY	2	0	2
	PERL-II	PERL-II	01	0	01
Total Credit Hours					19
3 rd Semester	GECCM	CIVICS AND COMMUNITY ENGAGEMENT	02	0	02
	GEICT	FUNDAMENTALS OF ICT (COMPUTER SCIENCES)	02	1	03
	GPA	GEN PATHOLOGY	03	0	03
	BOT 115	NEURO ANATOMY	3	0	3
	BOT 116	NEURO PHYSIOLOGY	3	0	3
	BOT 117	ENTERPRENEURSHIP	2	0	2
		SUPERVISED CLINICAL ROTATION	0	1	1
	EPC-1	ENGLISH PROFICIENCY-1	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					19
4 th Semester	BOT 119	COMMUNITY BASED MEDICINE REHABILITATION & OCCUPATIONAL HEALTH	3	0	3
	BOT 120	DEVELOPMENTAL PEADIATRICS	3	0	3
	BOT 121	OCCUPATIONAL THERAPY IN DEVELOPMENTAL PEADIATRIS	2	1	3
	BOT 122	KINESIOLOGY & BIOMECHANICS (GONIOMETRY / MANUAL MUSCLE TESTING)	3	1	4
	BOT 123	ACTIVITIES OF DAILY LIVINGS	2	1	3
	BOT 124	SUPERVISED CLINICAL ROTATION II	1	1	2
	EPC-2	ENGLISH PROFICIENCY-2	02	0	02
	PERL-IV	PERL-IV	01	0	01
Total Credit Hours					21
5 th Semester	BOT 125	MEDICINE-I	3	0	3
	BOT 126	SURGERY -I	3	0	3

	BOT 127	OCCUPATIONAL THERAPY IN ORTHOPEDICS AND SURGICAL CONDITIONS	2	1	3
	BOT 128	OCCUPATIONAL THERAPEUTICS	2	1	3
	BOT 129	ORTHOTICS, PROSTHETICS & ASSISTIVE TECHNOLOGIES	2	1	3
	BOT 130	SUPERVISED CLINICAL ROTATION III	1	1	2
	EPC-3	ENGLISH PROFICIENCY-3	02	0	02
	PERL-V	PERL-V	01	0	01
Total Credit Hours					20
6 th Semester	BOT 131	MEDICINE-II	3	0	3
	BOT 132	SURGERY –II	3	0	3
	BOT 133	OCCUPATIONAL THERAPY IN CARDIAC AND PULMONARY DISEASES	2	1	3
	BOT 134	OCCUPATIONAL THERAPY IN CRITICAL CARE, VISUAL AND HEARING IMPAIRED, BURNS & ONCOLOGY	2	1	3
	BOT 135	FIRST AID, CPR & CRISIS INTERVENTION MANAGEMENT	1	1	2
	BOT 136	PROFESSIONAL ETHICS	2	0	2
		SUPERVISED CLINICAL ROTATION IV (CARDIOPULMONARY, BURNS, ONCOLOGY, ICU, GERIATRICS)		2	2
	EPC-4	English Proficiency-4	02	0	02
	PERL-VI	PERL-VI	01	0	01
Total Credit Hours					21
7 th Semester	BOT 137	HAND REHABILITATION & SPLINTING	1	1	2
		PSYCHOLOGY	3	0	3
	BOT 138	PSYCHIATRY	3	0	3
	BOT 139	OCCUPATIONAL THERAPY IN MENTAL HEALTH	3	1	4
	BOT 140	ERGONOMICS & VOCATIONAL REHABILITATION	3	1	4
	BOT 142	SUPERVISED CLINICAL PRACTICE V (FIELD WORK)	3		3
	EPC-5	ENGLISH PROFICIENCY-5	02		2
	PERL-VII	PERL-VII	01		1
Total Credit Hours					21
8 TH Semester	BOT 143	OT VALUES, BELIEFS IN ACTION & EVIDENCE BASED OT PRACTICE	2	0	2
	BOT 144	RESEARCH PROJECT (CAPSTONE PROJECT)	3		3
	BOT 145	ORGANIZATION, ADMINISTRATION & WORK STUDY IN OCCUPATIONAL THERAPY	2	0	2
	BOT 146	SENSORY INTEGRATION THERAPY	2	1	3

	BOT 147	THERAPEUTIC ACTIVITIES & EXERCISES	2	1	3
	BOT 148	SUPERVISED CLINICAL PRACTICE VI	0	2	2
	EPC-6	ENGLISH PROFICIENCY-6	02	0	02
	PERL-VIII	PERL-VIII	01	0	01
Total Credit Hours					18

FUNDAMENTALS OF OCCUPATIONAL THERAPY

Credit Hrs. 2 (2+0)

Learning Outcomes/Objectives:

This course is designed to introduce the student to the profession of occupational therapy. Students will learn the philosophy behind occupational therapy, the concept of “occupation” in occupational therapy and how an individual’s participation in occupations can be impacted.

Course Content:	MCQs	SEQs
I. Historical and philosophical basis i. Definition ii. History of OT iii. Philosophical base of activities iv. Characteristics and value of activity v. Selection of activity	08	02
II. Occupational therapy practice i. Client-centered approach, evidence-based practice, social determinants ii. Person environment occupation model iii. Occupational therapy frame of references iv. Course of development, or social or cultural disruption may change a person’s participation in occupation v. Stages of the canadian practice process framework (cppf)	12	02
III. Occupational therapy in local and international context i. Structure of health care systems in Pakistan ii. Community, national and international agencies, and their function in relation to the disabled iii. Different fields and settings for practicing occupational therapy, internationally and locally iv. Performance areas and the performance components v. Describe professional responsibilities of an occupational therapist as a member of multidisciplinary rehabilitation team	10	02

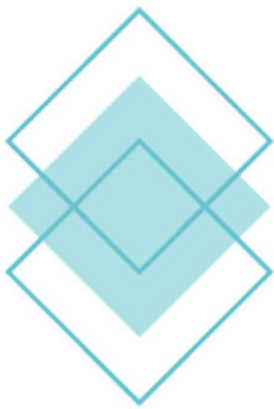
Recommended books:

1. Willard&spackman’s occupational therapy ,elizabethblesedellcrepeau, ellen s. Cohn, barbara a. Boyt schell, 6th edition
2. Willard&spackman’s Occupational Therapy , Elizabeth Blesedell Crepeau, Ellen S. Cohn, Barbara A. Boyt Schell, 11th edition
3. Occupational Therapy Physical Dysfunction for Sixth Edition, Mary Vining Radomski, Catherine A. Trombly Latham,
4. Introduction to occupational therapy 3rdedition .



Allied Health Sciences

Curricula 2024



**BS OPERATIONAL
THEATER
TECHNOLOGY
CURRICULUM**

BS OPERATIONAL THEATRE TECHNOLOGY/SURGICAL TECHNOLOGY

1. Introduction to Program

Operation theater Technologist/surgical technologist are a member of a multidisciplinary team in operation theaters who prepare and maintain an operating theater. Allied and healthcare professionals (AHPs) include individuals involved with the delivery of health or healthcare related services, with qualification and competence in therapeutic, diagnostic, curative, preventive and/or rehabilitative interventions. They work in multidisciplinary health teams in varied healthcare settings including doctors (physicians and specialist), nurses and public health officials to promote, protect, treat and/or manage a person('s) physical, mental, social, emotional, environmental health and holistic well-being.

2. Aims of the Program

The aim of the recommended curriculum is to produce operation theatre technologist who will be

- Effective members of the multidisciplinary team
- Technically and clinically competent with practical application of knowledge
- Aware of safety issues and the importance of quality assurance
- Able to understand the theoretical basis for evidence-based practice
- Identify priorities and effectively manage time and resources to ensure the maintenance or enhancement of the quality of care
- Systematically evaluate care; ensure the use of these findings to help improve people's experience and care outcomes, and to shape clinical treatment protocols and services
- Act as agents of change and be leaders in quality improvement and service development, so that they contribute and enhance people's wellbeing and their healthcare experience
- Facilitate themselves and others in the development of their competence, by using a range of professional and personal development skills
- Incorporate strategies for health promotion and disease prevention with their patients
- Develop efficient techniques for all forms of written and verbal communication including accurate and timely record keeping
- Recognize the need to make health care resources available to patients fairly, equitably and without bias, discrimination or undue influence
- Capable to participate in or initiate research into practice
- Able to handle / manage the administrative issues

3. Objectives of the Program

Following competencies will be expected from a student completing a 4 years degree course in Operation Theatre Technology. The student should be proficient in:

- Overall understanding of the surgical suits, working of operation theater & central sterile Supply Department
- Acquire an understanding of the ethical, legal, moral, and medical values related to the patient and the surgical team during the peri-operative experience.
- Assume accountability as an advocate for the patient's right to privacy, dignity, safety and comfort.
- Apply the principles of asepsis in all aspects of the role of operation theater technologist.
- Apply Standard Precautions to ensure the health & safety of patients & OT staff & him/her.
- Leading the team of technician & assistants in care of equipment & supplies including sterilization & disinfection

- Apply sterile techniques to create sterile fields and maintain the sterility of the field during the procedure.
- Provide for the environmental safety of the patient and the surgical team.
- Demonstrate organizational skill and manual dexterity in the preparation of a safe peri-operative environment.
- Implement safe practice techniques in regards to peri-operative routines, patient transportation, positioning, and emergency procedures.
- Apply knowledge of anatomy and physiology including recognition of pathologic deviations in the care of patients undergoing surgical procedures.
- Identify and respond to emergency situations in a calm and efficient manner.
- Demonstrate a basic understanding of the concepts of pharmacology.
- Correlate the elements, action, and use of medications and anesthetic agents used during the peri-operative experience.
- Communicate effectively in all interactions with surgeon, anesthetist, biomedical department and patients and appropriately address the bio-psychosocial needs of the surgical patient.
- Facilitate the surgeon during the surgery and make sure of all supplies needed for surgery.
- Maintenance of stock and inventories of the instruments and equipment.
- Collaboration and coordination with the instruments and equipment repair workforce (Biomedical Department of the institute).
- Participates in quality management activities, and operates within budget limits and cost effectiveness.
- Apply the knowledge of anesthesia techniques & Supplies to facilitate the anesthetist.
- Have complete knowledge & understanding of endoscopes, their functions and maintenance.
- Complete understanding of endoscopic & robotics setups.

4. Learning Outcomes of the Program

Sr. no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
1	Prepare and maintain Operation Theatre	Be familiar with the Operation Theatre and all the equipment.	Prepare the OT for the operation along with all the necessary equipment
		Know the protocols used in Operation Theatre	Interpret and understand all planning techniques to keep an OT functional
2	Maintain equipment support in an acute & elective care environment	Knowledge of preparing patients as required before emergency & elective operation.	Clean and store equipment safely to maintain a sterile chain.
			Position equipment in accordance with set up procedures
			Ensure extra sterile supplies for emergencies.
3	Facilitate anesthetist in handling	Knowledge of all basic anesthesia techniques & supplies needed inside & outside OT Room.	Prepare an emergency kit to handle areas outside the OT Room.

	emergencies outside of OT Room.		Ensure any signs or symptoms of a clinical emergency in per-operative settings is identified correctly and reported to the appropriate clinician
4	Follow infection control policies and procedures	Knowledge of effective infection control strategy that ensures the safety of the patient.	Perform the standard precautions to prevent the spread of infection in accordance with organization
		Knowledge of evaluation techniques to check effectiveness.	Collaborate with the microbiology department for time-based monitoring of fumigation & disinfection by culture, & swabbing.
5	Ensure availability of medical and diagnostic supplies	Anticipating demand and ensuring availability of adequate medical and diagnostic supplies.	Maintain adequate & proper functional supplies for medical and diagnostic procedures. Arrive at actual demand as accurately as possible
6	Prepare patient for operative procedures	Knowledge of SOPs/ checklist regarding pre-op patient preparation	Safely position patients to meet the requirements of the anesthetist and Surgeon.
		Knowledge of preparing patients as required before the operation	
7	Provide intra-operative equipment and technical support	Knowledge to support & facilitate the anesthetist and provide technical support during surgical procedure.	Monitoring the performance of equipment used and adjusting surgical equipment.
			Ensure the adequate functional stock of equipment.
8	Work effectively with others	Working with other people to meet requirements	Identify any problems with team members and other people and take the initiative to solve these problems.
9	Be able to demonstrate professional behavior	Explain the legal and ethical guidelines related to the profession	Promote collaborative practice
			Ensure proper documentation
10	Promote collaborative practice	Recognize the importance of accurate documentation	Complete the treatment documentation accurately

11	Manage hazardous waste	Knowledge of Handling, collecting and disposing of hazardous waste.	Coordinate the hazardous waste management program.
			Properly identify, segregate, handle, label, and store waste till safe disposal.

Career Opportunities of the Graduates

After completing 4 years degree program Operation Theatre/ Surgical Technologist will work as Operation theater and CSSD Manager in

- Public Sector Hospitals nationally and internationally
- Private Sectors nationally and internationally
- They can also work as teachers and research supervisors of relevant fields in teaching institutions.
- Work as application specialist in equipment and instrument industry

There are many lucrative career opportunities in this field due to extreme shortage of neurophysiology technologists throughout the globe.

5. Program Structure

GENERAL SUBJECT	
12 Courses	
30 Credit Hours	
Subject	Credit Hours
1. Arts and Humanities	02+0
2. Natural Sciences	02+01
3. Social Sciences	02+0
4. Functional English	03+0
5. Expository Writing	03+0
6. Quantitative Reasoning (I and II)	06 (2x03)
7. Ideology and Constitution of Pakistan	02+0
8. Islamic Studies	02+0
9. Applications of Information and Communication Technologies (ICT)	02+01
10. Entrepreneurship	02+0
11. Civics and Community Engagement	02+0
12. INTERDISCIPLINARY SUBJECTS	
04 Courses	
12 Credit Hours	
Subject	Credit Hours
1. General Pathology	03+0
2. Basic Anatomy	03+0
3. Basic Biochemistry	03+0
4. Basic Physiology	03+0
MAJOR SUBJECTS	

Courses	
84 Credit Hours (Minimum)	
Subject	Credit Hours
1. Advance Anatomy	3(3+0)
2. Advance Physiology	3(3+0)
3. Microbiology-I	3(2+1)
4. Microbiology-II	3(2+1)
5. Medical Physics	3(2+1)
6. Medical Ethics & Law	3(3+0)
7. Fundamentals of Operation Theatre Technology	3(2+1)
8. Pharmacology	3(2+1)
9. Fundamentals of Infection Control	3(2+1)
10. Quality & Safety in Health	3(2+1)
11. Fundamentals of Peri-operative Patient Care	3(2+1)
12. Basic Anesthesia Techniques	3(2+1)
13. Principles of Surgery	3(2+1)
14. Sterilization & Disinfection-I	3(2+1)
15. Sterilization & Disinfection-II	3(2+1)
16. Instruments & Equipment-I	3(2+1)
17. Instruments & Equipment-II	3(2+1)
18. Emergency & Intensive Care	3(2+1)
19. Biomaterials & Surgical Implants	3(3+0)
20. Endoscopic Instruments –I	3(2+1)
21. Endoscopic Instruments –II	3(2+1)
22. Operation Theatre Management-I	3(2+1)
23. Operation Theatre Management-II	3(2+1)
24. CSSD Management-I	3(2+1)
25. CSSD Management-II	3(2+1)
26. Research Methodology	3(3+0)
27. Behavioral Sciences	3(3+0)
28. Epidemiology & Public Health	3(3+0)
CAPSTONE PROJECT	
03 Credit Hours	
INTERNSHIP/ FIELD EXPERIENCE	
03 Credit Hours	

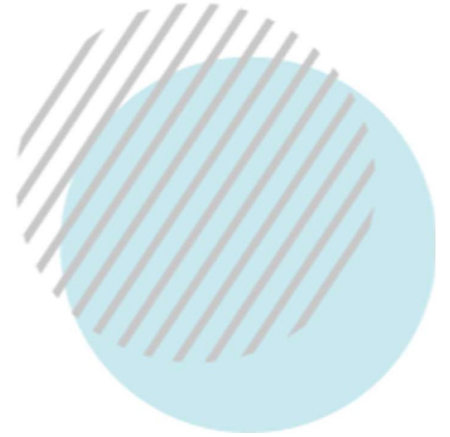
ENGLISH PROFICIENCY COURSES
12 Credit Hours
PERLs
08 Credit Hours

SCHEME OF STUDIES

SEMESTER	COURSE CODE	COURSE TITLE	THEORY	PRACTICAL	CREDIT HOURS
1st Semester	GEFE	Functional English	03	0	03
	GEQR	Quantitative Reasoning-I	03	0	03
	GENS	Natural Sciences	02	1	03
	GEAH	Arts and Humanities	02	0	02
	GEICP	Ideology and Constitution of Pakistan	02	0	02
	IDC	Basic Biochemistry	03	0	03
	PERL-I	PERL-I	01	0	01
Total Credit Hours					17
2nd Semester	GEEW	Expository Writing	03	0	03
	GEQR	Quantitative Reasoning-II	03	0	03
	GESS	Social Sciences	02	0	02
	GEIE	Islamic Studies/Ethics	02	0	02
	BAN	Basic Anatomy	03	0	03
	BPH	Basic Physiology	03	0	03
	PERL-II	PERL-II	01	0	01
Total Credit Hours					17
3rd Semester	GEE	Entrepreneurship	02	0	02
	GECCM	Civics and Community Engagement	02	0	02
	GEICT	Fundamentals of ICT (Computer Sciences)	02	1	03
	GPA	Gen Pathology	03	0	03
	MAA	Anatomy II	03	0	03
	MAP	Physiology II	03	0	03
	EPC-I	English Proficiency-I	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					19
	MPH	Pharmacology	02	1	03

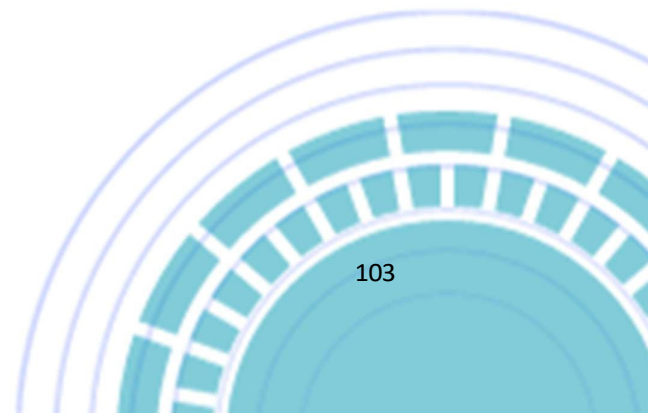
4th Semester	MM-I	Microbiology- I	02	1	03
	MMP	Medical Physics	02	1	03
	MFOT	Fundamentals of Operation theater technology	02	1	03
	MBS	Behavioral Sciences	03	0	03
	EPC-2	English Proficiency-2	02	0	02
	PERL-IV	PERL-IV	01	0	01
Total Credit Hours					18
5th Semester	MM-II	Microbiology- II	02	1	03
	MFPO	Fundamentals of Peri operative care	02	1	03
	MSD-I	Sterilization Disinfection – I	02	1	03
	MIE-I	Instrument and Equipment- I	02	1	03
	MBA	Basic Anesthesia techniques	02	1	03
	MMEL	Medical Ethics & Law	03	0	3
	EPC-3	English Proficiency-3	02	0	02
	PERL-V	PERL-V	01	0	01
Total Credit Hours					21
6th Semester	MSD-II	Sterilization Disinfection – II	02	1	03
	MIE-II	Instrument and equipment- II	02	1	03
	MBS	Biomaterial and Surgical implants	02	1	03
	MPS	Principles of Surgery	02	1	03
	MEI	Fundamentals of Infection Control	02	1	03
	MEPH	Epidemiology & Public Health	03	0	03
	EPC-4	English Proficiency-4	02	0	02
	PERL-VI	PERL-VI	01	0	01
Total Credit Hours					21
7th Semester	MEE-I	Endoscopic Equipment – I	02	1	03

	MOT-I	Operation Theatre Management- I	02	1	03
	MCSSD-I	CSSD Management-I	02	1	03
	MRM	Research Methodology	03	0	03
	INT	Internship/Field Experience	03	0	03
	EPC-5	English Proficiency-5	02	0	02
	PERL-VII	PERL-VII	01	0	01
Total Credit Hours					18
8th Semester	MEI	Emergency And Intensive Care	02	1	03
	MQS	Quality and safety in Health	02	1	03
	MEE-II	Endoscopic Equipment – II	02	1	03
	MOT-II	Operation Theatre management- II	02	1	03
	MCSSD-II	CSSD Management-II	02	1	03
	CAP	Capstone Project	03	0	03
	EPC-6	English Proficiency-6	02	0	02
	PERL-VIII	PERL-VIII	01	0	01
Total Credit Hours					18



**Allied Health Sciences
Curricula 2024**

**BS OPTOMETRY &
ORTHOPTICS
CURRICULUM**



BS OPTOMETRY & ORTHOPTICS

The Bachelor of Science (B.Sc Hons) degree program in Optometry & Orthoptics, offered by the University of Health Sciences Lahore, is designed to provide students with a comprehensive and in-depth education in the fields of Optometry and Orthoptics. This 4-year program equips students with the knowledge and practical skills necessary for successful careers in eye care and visual health.

2. Program Goals:

The primary goals of this program are:

- To provide a solid foundation in the fundamental principles of optometry and orthoptics.
- To instill a deep Explaining of ocular anatomy, physiology, and pathology.
- To develop proficiency in optometric procedures, diagnostics, and clinical practice.
- To prepare students for specialized roles in areas such as contact lenses, low vision, pediatric optometry, and more.
- To foster research skills and promote innovation in the field of eye care.

3. Program Objectives:

The program's key objectives are to enable students to:

- Acquire a comprehensive knowledge of the eye's anatomy, physiology, and common pathologies.
- Perform thorough eye examinations, including refraction and diagnosis.
- Apply advanced optometric and orthoptic techniques with ethical professionalism.
- Specialize in specific areas of eye care to meet evolving industry demands.
- Engage in research and contribute to advancements in eye health.

4. Program Learning Objectives:

Upon successful completion of the program, graduates will be able to:

- Demonstrate a profound Explaining of ocular science and its clinical applications.
- Conduct comprehensive eye assessments, employing sound diagnostic skills.
- Effectively apply optometric and orthoptic procedures in diverse clinical settings.
- Deliver specialized eye care services in fields such as contact lenses, low vision, and pediatric optometry.
- Contribute to research and innovation within the eye care industry.
- Provide essential eye care services to enhance the visual health of individuals and communities.

5. Career Prospects for Graduates:

Graduates of this program will find numerous career opportunities in the field of eye care, including:

- Optometrists, serving in private practices or clinical environments.
- Orthoptists, specializing in the diagnosis and treatment of eye movement disorders.
- Specialists in low vision care.
- Pediatric optometry experts.
- Contact lens practitioners.
- Professionals in ocular diagnostics.
- Researchers in eye health and visual sciences.
- Educators and academics in optometry and orthoptics programs.

This program paves the way for a dynamic and fulfilling career in the ever-expanding field of eye care, where graduates play a vital role in enhancing the visual well-being of individuals and communities.

GENERAL SUBJECT	
11 Courses	
30 Credit Hours	
Subject	Credit Hours
1. Arts and Humanities	02+0
2. Natural Sciences	02+01
3. Social Sciences	02+0
4. Functional English	03+0
5. Expository Writing	03+0
6. Quantitative Reasoning (I and II)	06 (2x03)
7. Ideology and Constitution of Pakistan	02+0
8. Islamic Studies	02+0
9. Applications of Information and Communication Technologies (ICT)	02+01
10. Entrepreneurship	02+0
11. Civics and Community Engagement	02+0

INTERDISCIPLINARY SUBJECTS	
04 Courses	
12 Credit Hours	
Subject	Credit Hours
1. General Pathology	03+0
2. Basic Anatomy	03+0
3. Basic Biochemistry	03+0
4. Basic Physiology	03+0
CAPSTONE PROJECT	
03 Credit Hours	

INTERNSHIP/ FIELD EXPERIENCE
03 Credit Hours

ENGLISH PROFICIENCY COURSES
12 Credit Hours

PERLs
08 Credit Hours

MAJOR SUBJECTS	Theory	Practical	Total
1. Ocular Anatomy	02	01	03
2. Ocular Physiology	02	01	03
3. Physical/ Geometrical/Instrumental Optics	02	01	03
4. Ocular Pathology –I	02	02	04
5. Ocular Pharmacology	02	01	03
6. Orthoptics-I	00	02	02
7. Ocular Pathology-II	02	01	03
8. Inclusive Eye Health (Basic & Intermediate Level)	01	01	02
9. Physiological & Visual Optics	02	01	03
10. Contact Lenses-I	02	01	03
11. Low Vision-I	02	01	03
12. Pediatric Optometry	02	01	03
13. Preventive Ophthalmology & Inclusive Eye Health-Advanced	03	0	03
14. Ocular Diagnostics	01	02	03
15. Low Vision-II	02	01	03
16. Contact Lenses-II	00	03	03
17. Clinical Rotation/Internship/field experience			03
18. Neuro-Ophthalmology	02	01	03
19. Geriatric Optometry	02	01	03
20. Occupational Optometry	02	01	03
21. Ophthalmic Care and Basics of Surgery	03	01	04
22. Elective From Orthoptics	03	01	04
23. Elective From Optometry	03	01	04
24. Research Methods	03	00	03
25. Biosafety & Risk Management	02	01	03
26. Capstone Project			03

ELECTIVE SUBJECTS		
--- Courses		
Subject		Credit Hours
1.	Clinical Optometry	03+00
2.	Contact Lenses	03+00

3.	Low Vision & Geriatric Optometry	03+00
4	Neuro-Orthoptics	03+00
5	Clinical Orthoptics	03+00
6	Pediatrics Optometry	03+00
7	Pediatrics Orthoptics	03+00
8	Geriatric Orthoptics	03+00

SCHEME OF STUDIES

SEMESTER	COURSE CODE	COURSE TITLE	THEORY	PRACTICAL	CREDIT HOURS
1st Semester	GEFE	Functional English	03	0	03
	GEQR	Quantitative Reasoning-I	03	0	03
	GENS	Natural Sciences	02	1	03
	GEAH	Arts and Humanities	02	0	02
	GEICP	Ideology and Constitution of Pakistan	02	0	02
	IDC	Basic Biochemistry	03	0	03
	PERL-I	PERL-I	01	0	01
Total Credit Hours					17
2nd Semester	GEEW	Expository Writing	03	0	03
	GEQR	Quantitative Reasoning-II	03	0	03
	GESS	Social Sciences	02	0	02
	GEIE	Islamic Studies/Ethics	02	0	02
	BAN	Basic Anatomy	03	0	03
	BPH	Basic Physiology	03	0	03
	PERL-II	PERL-II	01	0	01
Total Credit Hours					19
3rd Semester	GEE	Entrepreneurship	02	0	02
	GECCM	Civics and Community Engagement	02	0	0 2
	GEICT	Fundamentals of ICT (Computer Sciences)	02	1	0 3
	GPA	Gen Pathology	03	0	03
	MOA	Ocular Anatomy	03		03
	MOP	Ocular Physiology	03		03
	EPC-I	English Proficiency-I	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					20

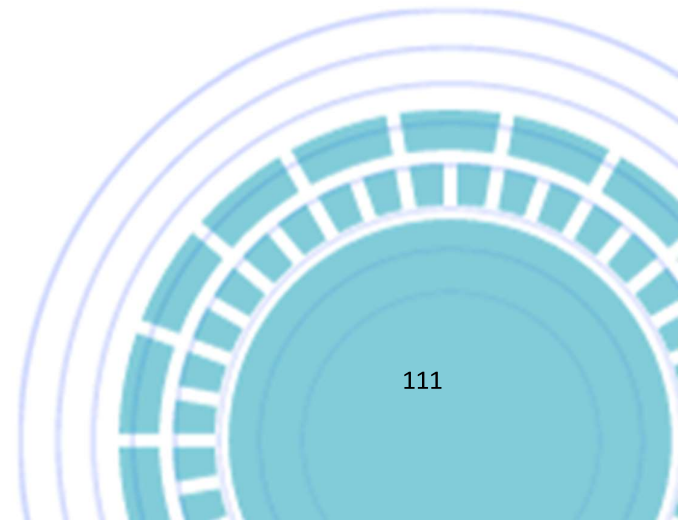
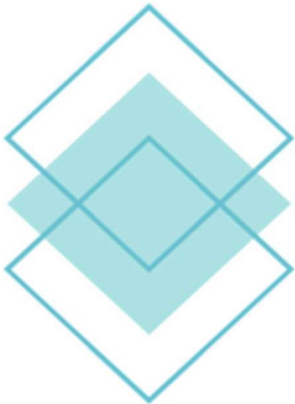
4th Semester	PGI	Physical/ Geometrical/Instrumental Optics	02	02	04
	OP-I	Ocular Pathology –I	02	01	03
	OPh	Ocular Pharmacology	02	01	03
	ORT	Orthoptics-I	01	01	02
	Neu	Neuroanatomy	02	01	03
	CM-I	Clinical Medicine in Optometric Practice-I	02	01	03
	EPC-2	English Proficiency-2	02	0	02
	PERL- IV	PERL-IV	01	0	01
Total Credit Hours					21
5th Semester	CM-II	Clinical Medicine In Optometric Practice-II	02	01	03
	OD	Ophthalmic Dispensing	02	02	04
	ORT-II	Orthoptics-II	03	01	04
	OP	Optometric Procedures	00	02	02
	OP-II	Ocular Pathology-II	02	01	03
	IEH	Inclusive Eye Health (Basic & Intermediate Level)	01	01	02
	EPC-3	English Proficiency-3	02	0	02
	PERL- V	PERL-V	01	0	01
Total Credit Hours					21
6th Semester	PVO	Physiological & Visual Optics	02	01	03
	CL-I	Contact Lenses-I	02	01	03
	LV-I	Low Vision-I	02	01	03
	POp	Pediatric Optometry	02	01	03
	POIE	Preventive Ophthalmology & Inclusive Eye Health- Advanced	03	0	03
	OD	Ocular Diagnostics	01	02	03
	EPC-4	English Proficiency-4	02	0	02
	PERL- VI	PERL-VI	01	0	01

Total Credit Hours					21
7th Semester	LV-II	Low Vision-II	02	01	03
	CL-II	Contact Lenses-II	00	03	03
	Int	Clinical Rotation/ INTERNSHIP/ FIELD EXPERIENCE			03
	N-Op	Neuro-Ophthalmology	02	01	03
	GO	Geriatric Optometry	02	01	03
	OO	Occupational Optometry	02	01	03
	EPC-5	English Proficiency-5	02	0	02
	PERL- VII	PERL-VII	01	0	01
Total Credit Hours					21
8th Semester	OCB	Ophthalmic Care and Basics of Surgery	02	01	03
	EI-Ort	Elective From Orthoptics	01	02	03
	EI-Opt	Elective From Optometry	01	02	03
	RM	Research Methods	03	00	03
	BRM	Biosafety & Risk Management	02	01	03
	EPC-6	English Proficiency-6	02	0	02
	PERL- VIII	PERL-VIII	01	0	01
	CP	Capstone Project			03
Total Credit Hours					21



**Allied Health Sciences
Curricula 2024**

**BS SPEECH &
LANGUAGE PATHOLOGY
CURRICULUM**



BS SPEECH & LANGUAGE PATHOLOGY

1. Introduction to Program

- Speech-language pathologists are health care professionals who identify, assess, and treat speech and language problems as well as swallowing disorders. They provide services to clients with disorders in the following areas:
- Speech disorders, including articulation problems, fluency (e.g., stuttering) disorders, and voice problems
- Language disorders, including receptive/expressive language, spoken and written language, and social/pragmatic language
- Swallowing disorders, including pediatric and adult feeding disorders
- Cognitive disorders, including dementia
- Speech-language pathologists work with people all throughout the lifespan. Most people already know that speech-language pathologists help children pronounce sounds correctly. But speech-language pathologists do a lot more than that! Speech-language pathologists may also do any of the following jobs:
- Work with toddlers and preschoolers to develop early language skills
- Teach children and adults with autism to use speech devices to communicate their wants and needs
- Help veterans with head injuries recover language comprehension and production skills.

2. Aims of the Program

The aim of the 4 years degree programme in Speech and Language Pathology is to equip the students with relevant professional knowledge, skills, techniques and ethical values to enable them to apply their acquired expertise at level between the doctors and the patient for efficient health service delivery.

3. Objectives of the Program

Speech and Language Pathology education and training should enable the student:

1. To provide at an undergraduate level, education and clinical/professional training which:
 - Involves research and clinical practice.
 - Uses a variety of teaching and learning methods including self-directed learning.
 - Integrates the development of theoretical knowledge with clinical skills across a wide range of patients.
2. To develop student learning and academic skills over four years thereby promoting continuing professional development and lifelong learning.

3. To enable students to meet the requirements of the relevant professional and statutory bodies.
4. To foster the development of professional knowledge and clinical skills across a wide range of patients presenting communication difficulties and to meet the clinical placement requirements of different hospitals.
5. To provide opportunities for self-monitoring and personal development for the formation of reflective practitioners.
6. To produce professionals who are capable of applying theoretical knowledge to the diagnostic, therapeutic, educative and technical roles of the Speech and Language Pathologist within the healthcare, educational and social welfare sectors.

4. Learning Outcomes of the Program

SPECIFIC LEARNING OUTCOMES

The SLP programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A) Knowledge and Understanding

1. Students have a comprehensive knowledge & understanding of human biological sciences, including: the anatomy & physiology of the body systems relevant to the development & maintenance of communication and swallowing; disruptions to these systems.
2. Students have a comprehensive knowledge & understanding of communication disabilities and swallowing disorders, and the ability to critically evaluate relevant information, including: developmental speech, language & communication disabilities; acquired speech, language & communication disabilities; voice disorders & laryngectomy; disorders of fluency; disorders of swallowing; developmental & acquired cognitive. Students has a comprehensive knowledge & understanding of human linguistics and its application to normal and impaired communication.
3. Students have a comprehensive knowledge & understanding of psychology and social context, including: the impact of communicative need on the psychological and social well-being of the person and his/her relationships; relevant aspects of psychology (developmental, health, social, cognitive, neuro-psychology, clinical learning theory) and the application of such knowledge to normal an impaired communication; educational philosophy & practice, health, workplace and multi- cultural society.

B) Values and Attitudes

1. Student can demonstrate awareness of and sensitivity to human diversity, including differences of culture, ethnicity, language disability, socio-economic status, etc.
2. Student can maintain the principles and practices of patient confidentiality.
3. Student can maintain the principles of the professional and statutory regulatory bodies.
4. Student demonstrates adherence to the professional code of conduct within the legal and ethical framework.
5. Student can recognize the obligation to maintain fitness for practice and the need for continuing personal and professional development.

C) Cognitive/Intellectual

1. Student is able to study independently using a variety of media including the Internet.
2. Student can critically evaluate evidence to support clinical practice.
3. Student can synthesize information from a range of sources and utilize fora given purpose.
4. Student has the ability to ask clinical questions, formulate hypotheses and develop research.
5. Student has the ability to use feedback to change learning and practice.

D) Subject Specific

1. Student has the ability to design and deliver patient centered & in case of children family intervention of an acceptable quality.
2. Student has the ability to draw on knowledge and skills in order to make professionally reasoned judgments and apply within the scope of the individual's practice.
3. Student has the ability to communicate effectively with patients, significant others and other relevant parties.
4. Student has the ability to address wider service issues including aspects of administration, case management.'
5. Student is able to reflect on own professional practice and to use supervision and other learning opportunities to advance professional development.

E) Communication & Team Work

Student can communicate using multiple media, including verbal, written, presentation, word processing and internet- based communication.

Student can manage workload, prioritizing as appropriate, within a time frame. Student can pursue independent learning for the advancement of knowledge and skills.

Student is able to work collaboratively with others and within a team. Student can take responsibility and execute duties in a professional manner.

5. Career Opportunities of the Graduates

a) Early Intervention and K–12 Schools:

Speech-language pathologists working in early intervention may do any of the following jobs:

Address feeding disorders in infants and toddlers

Provide parent education and training for promoting language development in toddlers

Visit day care centers and other preschool settings to provide services to children with receptive and expressive language delays

b) Health Care Settings:

Speech-language pathologists working in health care facilities may do any of the following jobs:

Diagnose and treat cognitive-communication and language disorders and/or swallowing problems

Work with premature babies in the neonatal intensive care unit (NICU) to develop their ability to drink milk safely and efficiently

Help patients with Alzheimer's disease stay oriented and help their families structure their day to help with memory and attention

c) Colleges and Universities:

Specifically, speech-language pathologists with research doctoral degrees may do any of the following jobs:

Make new discoveries about speech, language, and swallowing disorders Teach courses and mentor students in research, teaching, and clinical practice Serve on advisory boards as experts in communication disorders

Educate the public about communication development and disorders

6. Program Details

Courses (with Learning objectives, Content, Reference Books/Materials)

- General Subjects (Minimum 30 Credit Hours)
- Interdisciplinary (Minimum 12 Credit Hours)

- Major Subjects (Minimum 72 Credit Hours)
- Capstone Project (03 Credit Hours)
- Internship/Field Experience (03 Credit Hours)

Program Structure

GENERAL SUBJECT	
11 Courses	
30 Credit Hours	
Subject	Credit Hours
1. Arts and Humanities	02+0
2. Natural Sciences	02+01
3. Social Sciences	02+0
4. Functional English	03+0
5. Expository Writing	03+0
6. Quantitative Reasoning (I and II)	06 (2x03)
7. Ideology and Constitution of Pakistan	02+0
8. Islamic Studies	02+0
9. Applications of Information and Communication Technologies (ICT)	02+01
10. Entrepreneurship	02+0
11. Civics and Community Engagement	02+0

INTERDISCIPLINARY SUBJECTS	
04 Courses	
12 Credit Hours	
Subject	Credit Hours
1. General Pathology	03+0
2. Basic Anatomy	03+0
3. Basic Biochemistry	03+0
4. Basic Physiology	03+0

Major Courses		
Sr. #	Subject	Cr. Hr.
1.	Basic Phonology for Speech & Language Pathology	3 (2-1)

2.	Phonetics for Speech & Language Pathology	3 (2-1)
3.	Fundamentals of Speech & Language Pathology	3 (3-0)
4.	Linguistic for Speech & Language Pathology	3 (2-1)
5.	Developmental Paediatrics -I	3 (2-1)
6.	Medical and Surgical	3 (2-1)
7.	Psychiatry & Human Psychology	3 (2-1)
8.	Speech Disorder - I (Articulation & Phonological Disorder)	3 (2-1)
9.	Audiology & Speech Rehabilitation	3 (2-1)
10.	Developmental Languages Disorders	3 (2-1)
11.	Clinical Linguistics & Clinical Phonology	3 (2-1)
12.	Adult Neurogenic Language Disorder	3 (2-1)

13.	Speech Disorders – II(Fluency Disorders)	3 (2-1)
14.	Speech & Language Rehabilitation	3 (2-1)
15.	Developmental Paediatrics– II	3 (2-1)
16.	Speech Disorders – III (Voice & Resonance Disorders)	3 (2-1)
17.	Developmental Rehabilitation	3 (2-1)
18.	Evidence Based Practice	3 (2-1)
19.	Oral Motor Speech Disorder	3 (2-1)
20.	Learning Disorders	3 (2-1)
21.	Clinical Decision Making	3 (2-1)
22.	Cleft Palate & Disorders of Nasality	3 (2-1)
23.	Feeding & Swallowing Disorders	3 (2-1)
24.	Alternative & Augmentative Communication	3 (2-1)
25.	Clinical Supervised Practice – I	2 (0-2)
26.	Clinical Supervised Practice – II	2 (0-2)
27.	Clinical Supervised Practice – III	2 (0-2)
28.	Clinical Supervised Practice – IV	2 (0-2)
29.	Clinical Supervised Practice – V	2 (0-2)
31.	Biostatistics	3 (2-1)
32.	Research Methodology	3 (3-0)
33.	Research Project	3 (0-3)
34.	Medical Imaging for Speech and Language Pathology	3 (2-1)
	Total Credit Hours	96(52-44)

CAPSTONE PROJECT
03 Credit Hours

INTERNSHIP/ FIELD EXPERIENCE
03 Credit Hours

Scheme of Studies

SEMESTER	COURSE CODE	COURSE TITLE	THEORY	PRACTICAL	CREDIT HOURS
1st Semester	GEFE	Functional English	03	0	03
	GEQR	Quantitative Reasoning-I	03	0	03
	GENS	Natural Sciences	02	1	03
	GEAH	Arts and Humanities	02	0	02
	GEICP	Ideology and Constitution of Pakistan	02	0	02
	IDC	Basic Biochemistry	03	0	03
	PERL-I	PERL-I	01	0	01
Total Credit Hours					19
2nd Semester	GEEW	Expository Writing	03	0	03
	GEQR	Quantitative Reasoning-II	03	0	03
	GESS	Social Sciences	02	0	02
	GEIE	Islamic Studies/Ethics	02	0	02
	IDC	Basic Anatomy	03	0	03
	IDC	Basic Physiology	03	0	03
	BS SLP 105	Fundamentals of Speech & Language Pathology	03	0	03
	PERL-II	PERL-II	01	0	01
Total Credit Hours					17
3rd Semester	GEE	Entrepreneurship	02	0	02
	GECCM	Citizenship Education and Community Engagement	02	0	02
	GEICT	Applications of Information and Communication Technologies (ICT)	02	1	03
	IDC	General Pathology	03	0	03
	BS DP 200	Developmental Pediatrics-I	02	1	03
	BS PC/BSMS 202	Medical & Surgical	02	1	03
	BS PHP 203	Psychiatry & Human Psychology	02	1	03
	EPC-I	English Proficiency-I	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					22
4th Semester	BS HS 211	Audiology & Speech Rehab	02	1	03
	BS LD 212	Developmental Language Disorder /Receptive, Expressive, ASD	02	1	03

	BS LP 112	Linguistic for Speech & Language Pathology	02	1	03
	BS SD 204	Speech Disorder-I / Phonological & Articulation Disorders	02	1	03
	BS DP 214	Developmental Pediatrics-II Assessment & Documentation	02	1	03
	BS CLP 215	Clinical Linguistics & Clinical Phonology	02	1	03
	BS PSC 216	Clinical supervised practic-1	0	2	02
	EPC-2	English Proficiency-2	02	0	02
	PERL-IV	PERL-IV	01	0	01
Total Credit Hours					23
5th Semester	BS NLD 300	Adult Neurogenic Language Disorders	02	1	03
	BS PSL 114	Phonology & Phonetics for Speech & Language Pathology	02	1	03
	BS PSLP 201	Basic Phonology for Speech & Language Pathology	02	1	03
	BS SDF 213	Speech Disorder-II / Fluency Disorders	02	1	03
	BS SLR 302	Speech & Language Rehabilitation, Assessment, Planning of Treatment Programs	02	1	03
	BS DR 303	Developmental Rehabilitation (Care of the Physically Disabled, Communication of GDD Children, Adolescents & Adults) Observation of Developing Child	02	1	03
	BS PSC 304	Clinical Supervised Practice-II	0	2	02
	EPC-3	English Proficiency-3	02	0	02
	PERL-V	PERL-V	01	0	01
Total Credit Hours					23
6th Semester	BS OMS 311	Oral Motor Speech Disorders (Dysarthria & Apraxia)	02	01	03
	BS VD 301	Speech Disorders-III / Voice & Resonance Disorder, Rehab of laryngectomized patients	02	01	03
	BS LD 312	Learning Disorders (Reading, Writing Difficulties)	02	01	03
	BS CDM 313	Clinical Decision Making	02	01	03
	BS PSC 314	Clinical Supervised Practice-III	0	02	02
	BS RM 315	Research Methodology	03	00	03
	EPC-4	English Proficiency-4	02	0	02
	PERL-VI	PERL-VI	01	0	01

Total Credit Hours					20
7th Semester	BS CPD 400	Cleft Palate Disorder of Nasality (Craniofacial Abnormalities)	02	01	03
	BS SD 401	Feeding & Swallowing Disorders (Dysphagia)	02	01	03
	BS AAC 402	Alternative & Augmentative Communication (AAC for Children & Adults)	02	01	03
	BS BS 403	Bio Statistics	02	01	03
	BS MI 404	Medical Imaging for Speech and Language Pathology	02	01	03
	BS PCC 404	Clinical Supervised Practice-IV	0	02	02
	EPC-5	English Proficiency-5	02	0	02
	PERL- VII	PERL-VII	01	0	01
Total Credit Hours					20
8th Semester	BS PEA 412	Professional & Ethical Aspects of Speech Therapy	03	00	03
	BS PCS 413	Clinical Supervised Practice-V	0	03	03
	BS EBP 414	Evidence Based Practice	02	01	03
	BS PH 407	Pharmacology	3	0	03
	BS ID 415	Capstone Project	0	03	03
	EPC-6	English Proficiency-6	02	0	02
	PERL- VIII	PERL-VIII	01	0	01
Total Credit Hours					18

FUNDAMENTALS OF THE SPEECH & LANGUAGE PATHOLOGY
Credit Hour: 3(3-0)

Objectives and Learning Outcomes:

- Understand the fundamentals of speech, language, and communication and their relevance to human interaction.
- Explore the scope of Speech and Language Pathology (SLP) as a field, identifying its impact across various service delivery settings.
- Recognize the major responsibilities and work activities of Speech-Language Pathologists (SLPs) within different clinical and non-clinical environments.
- Familiarize with the roles and responsibilities of Speech-Language Pathologists through observation of clinical practices across different areas of SLP.
- Develop an introductory understanding of clinical work and how it is applied to various speech and language disorders through observation of practicing clinicians.
- Comprehend the anatomical and physiological mechanisms underlying speech production.
- Identify and describe the processes involved in phonation, articulation, and resonance.

Outline	MCQ	SEQ
Introduction speech language and communication	10	02
Scope of Speech & language pathology	05	01
Major work activities of SLP in various settings of service delivery in SLP	05	01
The clinical processes & the Speech Language pathologists	05	02
Introduction clinical work by observing clinicians working in different areas of speech and language pathology	05	01
Role & Responsibilities of Speech & Language Pathologist	05	01
Production of Speech	10	01

Recommended Books:

1. Human communication disorder by Noma D Anderson 8th Edition
2. Human Communication Disorders: An Introduction 6th Edition by Ed. Shames, George H.



**Allied Health Sciences
Curricula 2024**

**DOCTOR OF PHYSICAL
THERAPY
CURRICULUM**

DOCTOR OF PHYSICAL THERAPY (DPT), PROGRAM

Physical therapy is an essential segment of modern health care system. It is a “science of healing and art of caring”. It pertains to the clinical examination, evaluation, assessment, diagnosis and treatment of musculoskeletal, Neurological, Cardio-Vascular and Respiratory systems’ functional disorders including symptoms of pain, edema, and physiological, structural and psychosomatic ailments. It deals with methods of treatment based on movement, manual therapy, physical agents, and therapeutics modalities to relieve the pain and other complications.

Hence, Physical therapy covers basic parameters of healing sciences i.e. preventive, promotional, diagnostic, rehabilitative, and curative.

GOALS OF THE PROGRAM:

The purpose of the doctor of physical therapy program (DPT) is to prepare physical therapists who will:

1. Be primary providers of physical therapy care.
2. Serve as responsible members in the professional community and are willing and able to assume leadership roles in the communities they serve.
3. Identify researchable problems, advocate and participate in research, and incorporate research findings into clinical practice.
4. Understand and place in context the social, economic and cultural issues of practice and effectively advocate for changes in policy
5. Correlate theory with practice and think creatively about, react to, adapt or shape new practice environments.
6. Participate in and provide education for communities, patients, peers, students and others.

OBJECTIVES OF THE PROGRAM:

Graduates of the doctor of physical therapy program will:

1. Demonstrate in-depth knowledge of the basic and clinical sciences relevant to physical therapy, both in their fundamental context and in their application to the discipline of physical therapy.
2. Understand, correlate and apply theoretical foundations of knowledge to the practice of physical therapy; evaluate and clarify new or evolving theory relevant to physical therapy.
3. Demonstrate the behaviors of the scholarly clinician by developing and utilizing the process of critical thinking and inquiry, particularly focused on the improvement of the practice of physical therapy and the delivery of health care.
4. Engage in reflective practice through sound clinical decision making, critical self-assessment and commitment to lifelong learning.
5. Demonstrate mastery of entry level professional clinical skills. Provision of these services is based on the best available evidence and includes physical therapy examination, evaluation, diagnosis, prognosis, intervention, prevention activities, wellness initiatives and appropriate health care utilization.
6. Prepared to influence the development of human health care regulations and policies that are consistent with the needs of the patient and of the society.
7. Demonstrate leadership, management, and communication skills to effectively participate in physical therapy practice and the health care team.
8. Incorporate and demonstrate positive attitudes and behaviors to all persons.
9. Demonstrate the professional and social skills to adapt to changing health care environments to effectively provide physical therapy care.

Outcomes of the DPT Program:

As the profession of physical therapy moving towards a doctoral degree for some time due to the advancements in the foundational and clinical science and practice of physical therapy, therefore, entry-level physical therapist practitioners are:

1. Expected to screen patients for possible underlying medical conditions masquerading as Neuro-muscular, Musculo-skeletal, Cardio-pulmonary, Pediatrics and women health problems that may need referral to another health care practitioner.
2. Expected to assess and manage effectively the problems related to Neuro- muscular, Musculo-skeletal, Cardio-pulmonary, Pediatrics and women health through the use of evidence based treatments and rehabilitation protocols.
3. Expected to analyze and critique the evidence from research literature to inform choices about optimal interventions in order to achieve functional outcomes for patients.
4. Expected to demonstrate a thorough synthesis of evidence related to a defined clinical question pertinent to the profession of physical therapy.
5. Through both oral and written presentations, students will demonstrate competence in exploring the literature, assessing the strength of evidence, synthesizing the findings of individual studies, interpreting the results and applying the evidence to physical therapy practice.
6. Expected to complete a research project at the end of coursework in the form of a descriptive analytical or comparative study, a single case research design or applied clinical research significant to the field of Physical Therapy.

SCOPE OF PRACTICE:

The Doctor of Physical Therapy (DPT) is a clinical doctoral degree (entry level degree) that reflects the growth in the body of knowledge and expected responsibilities that a professional physical therapist must master to provide best practice to the consumer. All physical therapists are obligated to engage in the continual acquisition of knowledge, skills, and abilities to advance the science of physical therapy and its role in the delivery of healthcare. The qualified physical Therapist can be placed in:

- Government sector: Physical Therapists are appointed in hospitals in government sectors as Physical Therapists in Grade – 17 as the initial grade of appointment.
- Physical Therapy Institutes as demonstrator: As lecturer, Senior Lecture, Assistant Professor, associate Professor and Professor depending upon their educational qualification and experience.
- Hospital and Clinics: As Clinical Therapists, senior Therapist and Supervisor of the facility according to their qualification and experience.
- Sports Sector: As Sports Physical Therapist, team Physical Therapist and clinical Heads of sports clinic.
- Rehabilitation Centers: As Rehabilitation specialist both in adult and pediatric.
- Women Health: A newly emerging field where Physical therapist provide specialized care in Obs/Gynae and urinary /Bladder incontinent issues related to women.
- ICU/CCU/PICU/NICU: As Respiratory Therapist where a Physical Therapist play a life-saving role.
- Geriatric and Neurological Rehabilitation Center: Old age in itself is been considered a separate branch of medicine where a physical therapist play an important role in diagnosing, giving assessment and management of conditions while keeping in mind the age related abnormalities of the individuals. In addition to that a lot of Neurological conditions including Stoke, Parkinson's, MS, MND are mostly related to the individuals with older age groups.
- School Systems and Special Education institutes: Physical Therapists are involved in the physical assessment of the students and their management as it is necessary for

timely screening of the students so that necessary help be advised to the parents.

- Private Practice: Physical Therapist can also establish their own private practice as per rules and regulation of the government.
- Nursing Care: In addition to these, Physical Therapists are working in Nursing care Facilities, Skilled Nursing Facilities, and Long Term Care Facilities.
- Home Healthcare services: Physical Therapist also involve in home health care as most of the patient in their old age or with some neurological deficit unable to attend Out-patient Physical Therapy Care and it is mandatory to provide physical therapy services to these patients at home.

SPECIALITY AREAS:

Physical Therapists are specializing in vast majority of fields such as:

- Master and Ph.D in Musculoskeletal Physical Therapy.
- Master and Ph.D in neuro muscular Physical Therapy.
- Master in Geriatric and Neuromuscular Physical Therapy.
- Integumentary Physical Therapy.
- Master in Orthopedic Manual Physical Therapy
- Masters & PhD in Pediatrics Physical Therapy.
- Master and Ph.D in Sports Physical Therapy
- Master in Kinesiology.
- Master in Biomechanics
- M.Phil in Anatomy and Physiology.
- Master in women Health.
- Master in Cardiopulmonary Physical Therapy
- Master and Ph.D in Spinal Cord Injury Management & rehabilitation
- Master in Advance Physical Therapy

Credit Hours Distribution:

Doctor of Physical Therapy is a 5-Years Degree Program. The Distribution of credit hours is as follows as per HEC undergraduate Education Policy 2023:

6. General Education (30 Cr. Hrs.):

GENERAL SUBJECT	
12 Courses	
30 Credit Hours	
Subject	Credit Hours
1. Arts and Humanities	02
2. Natural Sciences	03
3. Social Sciences	02
4. Functional English	03
5. Expository Writing	03
6. Quantitative Reasoning (I and II)	06
7. Ideology and Constitution of Pakistan	02
8. Islamic Studies	02
9. Applications of Information and Communication Technologies (ICT)	03
10. Entrepreneurship	02
11. Civics and Community Engagement	02
Total	30

7. Interdisciplinary Courses (Min 12 Cr. Hrs.)

S. No	Subjects	Credit Hours
1	Anatomy	12
2	Physiology	09
3	Exercise Physiology	03
4	Biochemistry	04
5	Behavioral Sciences	02
6	Pathology & Microbiology	05
7	Pharmacology	04
8	Medicine	06
9	Surgery	06
10	Radiology & Diagnostic Imaging	02
11	Emergency Procedures	02
12	Research Methodology	02
TOTAL		57

8. Field Experience (3 Cr. Hrs.):

S. No	Subjects	Credit Hours
1	Internship/Field Experience	3

9. Capstone Project (3 Cr. Hrs.)

S. No	Subjects	Credit Hours
1	Research Project	3

10. Disciplinary or Major

S. No	Subjects	Credit Hours
1	Kinesiology	6
2	Biomechanics & Ergonomics	6
3	Medical Physics	2
4	Electrotherapy	6
5	Therapeutics Exercises & Techniques	6
6	Musculoskeletal Physical Therapy	6
7	Manual Therapy	6
8	Professional Practice	2
9	Evidence Based Practice	3
10	Sports Physical Therapy	3
11	Neurological Physical Therapy	6
12	Geriatrics Physical Therapy	2
13	Pediatric Physical Therapy	3
14	Cardiopulmonary Physical Therapy	3
15	Gynae & Obs. Physical Therapy	2
16	Clinical Decision Making & Differential Diagnosis	3
17	Orthotics & Prosthetics Physical Therapy	2
18	Integumentary Physical Therapy	2
19	Supervised Clinical Practice	18
TOTAL		87

ENGLISH PROFICIENCY COURSES
12 Credit Hours

PERLs
08 Credit Hours

DOCTOR OF PHYSICAL THERAPY (DPT), PROGRAM

SEMESTER	COURSE CODE	COURSE TITLE	THEOR Y	PRACTIC AL	CREDIT HOURS
1st Semester	GEFE	Functional English	3	0	3
	GEQR	Quantitative Reasoning-I	3	0	3
	GENS	Natural Sciences (Bio-Physics)	2	1	3
	GEAH	Arts and Humanities (Behavioral Sciences)	2	0	2
	GEICP	Ideology and Constitution of Pakistan	2	0	2
	IDCA-I	Anatomy-I	2	1	3
	IDCP-I	Physiology-I	2	1	3
	MCK-I	Kinesiology-I	2	0	2
	PERL-I	PERL-I	01	0	01
Total Credit Hours					22
2nd Semester	GEEW	Expository Writing	3	0	3
	GEQR	Quantitative Reasoning-II	3	0	3
	GESS	Social Sciences (Medical Sociology)	2	0	2
	GEIE	Islamic Studies/Ethics	2	0	2
	IDCA-II	Anatomy-II	2	1	3
	IDCP-II	Physiology-II	2	1	3
	MCK-II	Kinesiology-II	3	1	4
	PERL-II	PERL-II	01	0	01
Total Credit Hours					21
3rd Semester	GEE	Entrepreneurship	2	0	2
	GECCM	Civics and Community Engagement	2	0	2
	GEICT	Applications of information and communication technologies (ICT)	2	1	3
	IDCA-III	Anatomy -III	2	1	3
	IDCP-III	Physiology-III	2	1	3
	MCBE-I	Biomechanics & Ergonomics- I	2	1	3
	IDCB-I	Biochemistry-I	2	0	2
	EPC-I	English Proficiency-I	02	0	02
	PERL-III	PERL-III	01	0	01
Total Credit Hours					21
4th Semester	IDCA-IV	Anatomy-IV	2	1	3

	IDCEP	Exercise Physiology	2	1	3
	MCBE-II	Biomechanics & Ergonomics- II	2	1	3
	MCMP	Medical Physics	2	0	2
	IDCB-II	Biochemistry-II	2	0	2
	EPC-2	English Proficiency-2	02	0	02
	PERL-IV	PERL-IV	01	0	01
Total Credit Hours					16
5th Semester	IDCPM-I	Pathology & Microbiology-I	2	1	3
	IDCPT-I	Pharmacology & Therapeutics-I	2	0	2
	MCTET-I	Therapeutic Exercises & Techniques –I	2	1	3
	MCE-I	Electrotherapy-I	2	1	3
	MCEBP	Evidence-Based practice	3	0	3
	MCSCP-I	Supervised Clinical Practice-I	0	3	3
	EPC-3	English Proficiency-3	02	0	02
	PERL-V	PERL-V	01	0	01
Total Credit Hours					20
6th Semester	IDCPM-II	Pathology & Microbiology-II	2	0	2
	IDCPT-II	Pharmacology & Therapeutics-II	2	0	2
	MCTET-II	Therapeutic Exercises & Techniques –II	2	1	3
	MCE-II	Electrotherapy-II	2	1	3
	MCMT-I	Manual Therapy-I	2	1	3
	MCPP	Professional Practice in PT	2	0	2
	MCSCP-II	Supervised Clinical Practice-II	0	3	3
	EPC-4	English Proficiency-4	02	0	02
	PERL-VI	PERL-VI	01	0	01
Total Credit Hours					21
7th Semester	IDCS-I	Surgery-I	3	0	3
	IDCM-I	Medicine-I	3	0	3
	MCMPT-I	Musculoskeletal-I (Extremities)	2	1	3
	MCSPT	Sports Physical Therapy	2	1	3
	MCIFE	Internship/Field Experience	3	0	3
	MCSCP-III	Supervised Clinical Practice-III	0	3	3
	EPC-5	English Proficiency-5	02	0	02
	PERL-VII	PERL-VII	01	0	01

Total Credit Hours					21
8th Semester	IDCS-II	Surgery-II	3	0	3
	IDCM-II	Medicine-II	3	0	3
	IDCRM	Research Methodology & Scientific Inquiry	2	0	2
	MCMPT-II	Musculoskeletal PT-II (Spine)	2	1	3
	MCMT-II	Manual Therapy-II (Spine)	2	1	3
	MCSCP-IV	Supervised Clinical Practice-IV	0	3	3
	EPC-6	English Proficiency-6	02	0	02
	PERL-VIII	PERL-VIII	01	0	01
Total Credit Hours					20
9th Semester	IDCEP	Emergency Procedures & Primary Care in Physical Therapy	2	0	2
	IDCRDI	Radiology & Diagnostic Imaging	2	0	2
	MCNPT-I	Neurological PT-I	2	1	3
	MCCPT	Cardiopulmonary Physical Therapy	2	1	3
	MCIPT	Integumentary Physical Therapy	2	0	2
	MCOG PT	Obstetrics & Gynecological PT	2	0	2
	MCSCP-V	Supervised Clinical Practice-V	0	3	3
Total Credit Hours					17
10th Semester	MCNPT-II	Neurological PT-II	2	1	3
	MCCD	Clinical Decision-Making & Differential Diagnosis	3	0	3
	MCPPT	Pediatric Physical Therapy	2	1	3
	MCGGPT	Gerontology & Geriatric PT	2	0	2
	MCOPPT	Orthotics & Prosthetic PT	2	0	2
	MCCP	Capstone Project (3 Cr. Hrs.)	0	3	3
	MCSCP-VI	Supervised Clinical Practice-VI	0	3	3
Total Credit Hours					19

Note:

- Total Credit Hour in 5 years = 180
- Credit hours distribution is as following:

Theory:

- One credit hour shall be equal to one hour of teaching per week throughout the semester.

Practical / lab:

- One credit hour shall be equal to three hours of lab work per week throughout the semester.

Clinical:

- One credit hour shall be equal to three hours of clinical work per week throughout the semester.

Research:

- One credit hour shall be equal to three hours of research work per week throughout the semester.

**INTERDISCIPLINARY
COURSES
(DPT)**

ANATOMY-I

Credit Hours 03 (2+1)

30 MCQs & 6 SEQs

5 OSPEs

Learning Outcomes/Objectives:

1. Define basic technical terminology and language associated with anatomy.
2. Describe the structure of the organs in the human body with emphasis on the applied aspect.
3. Comprehend the histological structure and identify histological slides of the basic tissues of the human body.
4. Describe the gross anatomy of the upper limb's bones, joints, muscles, and neurovasculature and their anatomical relationship.
5. Demonstrate anatomical landmarks and configuration of the Upper limb, through dissection/identification of structures in the manikins / smart board systems supplemented with studying models, prosected materials, and radiographs.
6. Demonstrate the surface markings of clinically important structures, on normal living bodies.

Course Content	MCQs	SEQs	OSPE
GENERAL ANATOMY			
Introduction to General Anatomy and Integumentary system <ul style="list-style-type: none"> • Terms related to position and movements • The skin and subcutaneous tissues • Appendages of skin • Glands associated with hair follicle • 	1		
Bones and Cartilages <ul style="list-style-type: none"> • Osteology • Classification of bones • Parts of developing long bones • Blood supply of bones • Lymphatic vessels & nerve supply • Rule of direction of nutrient foramen • Gross structure of long bone • Cartilage 	2	1	
The Muscle <ul style="list-style-type: none"> • Introduction • Classification • Type of skeletal muscles • Parts of skeletal muscle and their action • Nomenclature 	2		
The Joints <ul style="list-style-type: none"> • Introduction • Functional and Structural classification 	2	1	

<ul style="list-style-type: none"> Structures comprising a Synovial joint Movements of joints Blood supply of Synovial joints, their nerve supply and lymphatic drainage Factors responsible for joint stability 			
Cardiovascular System <ul style="list-style-type: none"> Division of circulatory system into pulmonary & systemic Classification of blood vessels Heart and Pericardium Function of the Heart Anastomosis 	2		
Nervous System <ul style="list-style-type: none"> Outline of cellular architecture Classification of nervous system Parts of the central nervous system Functional components of Nerve Typical spinal nerve Introduction of autonomic nervous system Anatomy of neuromuscular junction 	2		
GENERAL HISTOLOGY			
General Histology Description and Microscopic picture of <ul style="list-style-type: none"> Cell Epithelium Connective tissue Bone Skeletal, smooth and cardiac muscles Nerve, cerebrum, cerebellum, spinal cord Blood vessels and Heart Skin and appendages Lymphatic organs 	2	1	1
UPPER LIMB			
Upper Limb Osteology <ul style="list-style-type: none"> Detailed description of all bones of upper limb and shoulder girdle along their musculature and ligamentous attachments. 	4	1	1
Myology <ul style="list-style-type: none"> Muscles connecting upper limb to the axial skeletal Muscles around shoulder joint Walls and contents of axilla Muscles in brachial region Muscles of forearm Muscles of hand Retinacula Palmar apouenrosis 	4	1	1

<ul style="list-style-type: none"> Flexor tendon dorsal digital expansion 			
Neurology <ul style="list-style-type: none"> Course, distribution and functions of all nerves of upper limb Brachial plexus 	3		
Angiology (Circulation) <ul style="list-style-type: none"> Course and distribution of all arteries and veins of upper limb Lymphatic drainage of the upper limb Axillary lymph node Cubital fossa 	2	1	1
Arthrology <ul style="list-style-type: none"> Acromioclavicular and sternoclavicular joints Shoulder joint Elbow joint Wrist joint Radioulnar joints Inter carpal joints Joints MCP and IP (Should be able to demonstrate movements at all these joints) Surface marking of upper limb 	4	1	1
Total	30	06	05

Recommended Instructional / Reading Materials:

1. Clinical Anatomy for Medical Students by Richard S. Snell.
2. General Anatomy by Prof. Laiq Hussain latest Ed.
3. Medical Histology by Prof. Laiq Hussain latest Ed.

ANATOMY-II

Credit Hours: 3(2-1)

30 MCQs & 6 SEQs

5 OSPEs

Learning Outcomes/Objectives:

1. Describe the gross anatomy of the neuro-musculoskeletal and circulatory system of the lower limb, Thoracic wall and Thoracic cavity
2. Demonstrate anatomical landmarks and configuration of the lower limb, abdominal wall, and pelvis through dissection/identification of structures in the manikins / smart board systems supplemented with studying models, prosected materials, and radiographs.
3. Demonstrate the surface markings of clinically important structures on normal living bodies.

Course Content	MCQs	SEQs	OSPE
LOWER LIMB			
Osteology <ul style="list-style-type: none"> • Detailed description of all bones of lower limb and pelvis along with their markings 	5	0	0.5
Myology <ul style="list-style-type: none"> • Muscles of gluteal region • Muscles around hip joint • Muscles of thigh • Muscles of lower leg and foot 	4	1	1
Neurology <ul style="list-style-type: none"> • Course, distribution, supply of all nerves of lower limb and gluteal region • Lumbosacral plexus 	4	1	1
Angiology <ul style="list-style-type: none"> • Course and distribution of all arteries, veins and lymphatic drainage of lower limb 	3		
Arthrology <ul style="list-style-type: none"> • Pelvis • Hip joint • Knee joint • Ankle joint • Joints of the foot • Surface Anatomy of lower limb • Surface Marking of lower limb 	4	1	0.5
THORAX			
Structures of the Thoracic Wall <ul style="list-style-type: none"> • Thoracic vertebrae • Sternum • Costal Cartilages & Ribs 	05	01	01

<ul style="list-style-type: none"> • Intercostal Muscles • Intercostal Nerves • Diaphragm • Blood supply of thoracic wall • Lymphatic drainage of thoracic wall • Joints of thorax 			
<p>Thoracic Cavity</p> <ul style="list-style-type: none"> • Mediastinum and its contents • Pleura • Trachea • Lungs • Bronchopulmonary segments • Pericardium • Heart – Its blood supply, venous drainage & nerve supply • Large veins of thorax, superior and inferior vena cava., pulmonary veins brachiocephalic veins • Large Arteries – Aorta & its branches 	05	02	01
Total	30	06	05

Laboratory Work:

During the study of Gross Anatomy, emphasis should be given to the applied aspect, radiological anatomy, surface anatomy, and cross-sectional anatomy of the region covered in the respective semester /year.

Recommended Instructional / Reading Materials:

1. Clinical Anatomy for Medical Students by Richard S. Snell.



PHYSIOLOGY-I

Credit Hours 03(2+1)

30 MCQs & 6 SEQs

3 OSPEs

Learning Outcomes/Objectives:

By the end of this semester, students will be able to:

1. Identify the functional organization of the human body with reference to homeostasis and regulatory mechanisms.
2. Discuss the physiological aspects of cellular function.
3. Describe the mechanisms governing the contraction of skeletal, smooth and cardiac muscle.
4. Discuss the basic physiological aspects of membrane potentials.
5. Describe the functions of blood cells and their role in immunity, allergy and hemostasis.
6. Correlate the basic physiological concepts of normal function with diseased conditions.

Course Content	MCQs	SEQs	OSPE
Cell Physiology <ul style="list-style-type: none"> • Functional organization of human body • Homeostasis • Control systems in the body • Cell membrane and its functions, transport across cell membrane • Cell organelles and their functions • Genes: control and function 	06	01	
Nerve and Muscle <ul style="list-style-type: none"> • Introduction to excitable tissue • Structure, function and types of neurons • Classification and physiological properties of nerve fibers • Resting membrane potential and action potential, properties and types of action potential • Conduction of nerve impulse • Nerve degeneration and regeneration • Synapse classification and properties, synaptic transmission, post synaptic potentials • Physiological structure of muscle • Skeletal muscle properties, mechanism of contraction, types of muscle contraction • Energetics of muscle contraction • Skeletal, smooth and cardiac muscle contraction • Neuromuscular junction, transmission and end plate potential • Excitation contraction coupling • Structure and function of motor unit • Physiology of smooth muscle contraction 	12	02	

<ul style="list-style-type: none"> • Clinical aspects: Myasthenia gravis, muscular dystrophies, rigor mortis, muscle atrophy, hypertrophy and hyperplasia 			
Blood <ul style="list-style-type: none"> • Composition and general functions of blood • Plasma proteins their production and function • Erythropoiesis and red blood cell function • Structure, function, production, degradation and different types of hemoglobin • Iron absorption storage and metabolism • Blood indices, function, production and type of white blood cells • WBCs: synthesis, types, functions and role in inflammation, immunity and allergy. • Components and functions of reticuloendothelial system • Blood groups and their role in blood transfusion • Complications of blood transfusion with reference to ABO & RH incompatibility • Function and production of platelets • Clotting mechanism of blood including clotting pathways. • Clinical aspects: Anemia, polycythemia, role of WBCs in infection, immunity and allergy, ABO incompatibility, transfusion reactions, erythroblastosis fetalis, clotting disorders including hemophilia and thrombocytopenia 	12	03	03
Total	30	06	03

Laboratory Work

1. Study of the microscope and identification of parts.
2. Red blood cell count.
3. White blood cell count.
4. Platelet count.
5. Differential leukocyte count.
6. Hemoglobin estimation by Sahli's method.
7. Blood indices.
8. Erythrocyte sedimentation rate.
9. Pack cell volume.
10. Bleeding time.
11. Clotting time.
12. ABO and Rh blood groups.

Practical copy will be assessed, and marks will be awarded at the time of examination.

Recommended Instructional / Reading Materials:

1. Textbook of Physiology by Guyton and Hall, 14th ed.
 2. Essentials of Medical Physiology by Mushtaq Ahmed.
 3. Review of Medical Physiology by William F. Ganong, 23rd ed
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PHYSIOLOGY-II

Credit Hours: 3(2-1)
30 MCQs & 6 SEQs
3 OSPEs

Learning Outcomes/Objectives:

By the end of this semester, students will be able to:

1. Describe the basic properties and functions of the gastrointestinal tract.
2. Discuss the physiological mechanisms that govern the functioning of the cardiovascular system and its regulation.
3. Illustrate the structure, functions and control of the respiratory system.
4. Correlate the basic physiological concepts of normal function with diseased conditions.

Course Content	MCQs	SEQs	OSPE
<p>Cardiovascular System</p> <ul style="list-style-type: none"> • Physiological properties of the myocardium • Cardiac cycle and regulation of heart pumping • Rhythmical excitation of the heart • ECG: waves, segments and intervals with physiological basis • Physiological classification of blood vessels • Hemodynamics of blood flow (Laws of hemodynamics, local and humoral control of tissue blood flow. • Arterial pulse and its regulation • Blood pressure and its regulation by rapid and long-term control mechanisms • Cardiac output, venous return and peripheral resistance: regulation • Heart sounds basis and characteristics • Microcirculation: fluid filtration across capillaries • Special circulations: coronary, splanchnic, pulmonary and cerebral circulation • Clinical aspects: tachycardia and bradycardia, sinus arrhythmia, sinoatrial and AV blocks with Stokes Adam syndrome, hypertension, circulatory shock (types, stages, clinical features, treatment options) 	12	03	02
<p>Respiratory System</p> <ul style="list-style-type: none"> • Functions of respiratory tract • Mechanics of breathing (muscles, pleural, alveolar and transpulmonary pressure) • Production & function of surfactant and compliance of lungs • Protective reflexes: cough and sneeze 	10	02	01

<ul style="list-style-type: none"> • Lung volumes and capacities including dead space • Diffusion of gases across the respiratory membrane • Relationship between ventilation and perfusion • Mechanism of transport of oxygen and carbon dioxide in blood • Nervous and chemical regulation of respiration • Clinical aspects: obstructive and restrictive lung diseases, hypoxia, cyanosis, dyspnea 			
<p>Physiology of Exercise:</p> <ul style="list-style-type: none"> • Common measurements in exercise physiology: Units of measure, work, power and energy definitions, measurements of energy expenditure • Energy requirements at rest, oxygen debt metabolic responses to exercise in short term, prolonged and incremental exercise. • Hormonal responses to exercise (muscle-glycogen utilization, blood glucose homeostasis during exercise, hormone–substrate interaction) • Exercise and the immune system: exercise and resistance to infection • Exercise and skeletal muscles: exercise and muscle fatigue, exercise-associated muscle cramps • Changes in oxygen delivery to muscle during exercise, circulatory responses to exercise, regulation of cardiovascular adjustments to exercise • Ventilatory and blood–gas responses, to exercise, ventilatory control during submaximal exercise, ventilatory control during heavy exercise • Overview of heat balance during exercise, temperature measurement during exercise in a hot environment exercise in a cold environment • VO_2 max definition and measurement, changes in VO_2 max in exercise, endurance training: effects on performance and homeostasis. <p>Physiology of health and fitness</p> <ul style="list-style-type: none"> • Field tests for estimating cardiorespiratory fitness, graded exercise tests: measurements, VO_2 max, graded exercise test protocols. 	<p>08</p>	<p>01</p>	

<ul style="list-style-type: none"> • Exercise prescription for health and fitness (prescription of exercise, general guidelines for improving fitness) • Exercise for special populations (Diabetes, asthma, COPD, hypertension, cardiac rehabilitation, exercise for older adults, exercise during pregnancy) 			
Total	30	06	03

Laboratory Work

CVS:

1. Examination of precordium (including heart sounds and apex beat)
2. Examination of JVP
3. Recording of ECG and identification of waves, segments and intervals
4. Examination of arterial pulse
5. Recording of arterial blood pressure
6. Examine the effects of exercise and posture on blood pressure
7. Demonstration of cardiopulmonary resuscitation

Respiration

1. Examination of respiratory system (inspection, palpation, percussion and auscultation)
2. Lung function tests by spirometry and identification of volumes and capacities on spirogram.
3. Recording the peak expiratory flow rate

Exercise Physiology:

1. Predicting VO_2 max using the Harvard step test
2. Demonstration of Stoop test

Practical copy will be assessed, and marks will be awarded at the time of examination.

Recommended Instructional / Reading Materials:

1. Textbook of Physiology by Guyton and Hall, 14th ed.
2. Review of Medical Physiology by William F. Ganong, 23rd ed.
3. Essentials of Medical Physiology by Mushtaq Ahmed.
4. Exercise Physiology- Theory and Application to Fitness and Performance by: Scott K. Powers, Edward T. Howley.
5. Exercise physiology, A thematic Approach By: Tudor Hale, University College Chichester, UK. .

MAJOR COURSES

KINESIOLOGY-I

Credit Hours 02(2+0)

Learning Outcomes/Objectives:

1. Define the mechanical principles and their application on the human body
2. Describe concept of movement and how it occurs in body
3. Demonstrate fundament position, their effects and uses
4. Explore fundamental skills to differentiate between a good and bad posture and to use technique for re-education
5. Develop critical thinking ability in students on how and why to select which technique in a specific case, suitable for its rehabilitation
6. Describe muscular anatomy, its function against gravity and manual resistance

Course Content	MCQs	SEQs
<p>I. Introduction To Kinesiology</p> <ul style="list-style-type: none"> i. Definition of Physical Therapy and Rehabilitation ii. Definition of Kinesiology iii. Mechanical Principles and Mechanics of Position iv. Force - force system – Description of units v. Gravity: Center of gravity and line of gravity vi. Level of gravity vii. Equilibrium 28 viii. Fixation and Stabilization ix. Mechanics of movement x. Axes / Planes xi. Speed xii. Velocity xiii. Acceleration xiv. Momentum xv. Inertia xvi. Friction xvii. Lever - types – application in human body xviii. Pulley - types – application in human body xix. Angle of pull 	4	1
<p>II. Introduction to Movement</p> <ul style="list-style-type: none"> i. Types of movement and posture ii. Patterns of movement iii. Timing in movement iv. Rhythm of movement v. The nervous control of movement 	2	0
<p>III. An Introduction to Exercise Therapy</p> <ul style="list-style-type: none"> i. Define Exercise Therapy ii. Explain the aims of exercise therapy iii. Define and classify the exercise therapy in context with movement and posture. 	3	1

iv. Explain briefly approach and assessment to patient's problem		
IV. Starting Positions <ul style="list-style-type: none"> i. Definition ii. Fundamental positions iii. Standing iv. Kneeling v. Sitting vi. Lying vii. Hanging viii. The pelvic tilt 	4	1
V. Derived Positions <ul style="list-style-type: none"> i. Purpose of Derived Positions ii. Positions derived from standing by: alteration of arms, legs and trunk. iii. Positions derived from kneeling iv. Positions derived from sitting by: alteration of the legs & by alteration of trunk v. Positions derived from lying, by alteration of arms and by alteration of the legs vi. Positions derived from hanging vii. Other positions in which some of the weight is taken on the arms 	4	0
VI. Posture <ul style="list-style-type: none"> i. Inactive postures ii. Active postures iii. The postural mechanism iv. The pattern of posture v. Principles of Re- Education vi. Techniques of Re-Education vii. Prevention of muscles wasting viii. The initiation of muscular contraction ix. Abnormal postures 	4	1
VII. Muscle Strength and Muscle Action <ul style="list-style-type: none"> i. Types of Muscles contraction ii. Muscles tone iii. Physiological application to postural tone iv. Group action of muscles v. Overview of muscle structure vi. Types of muscle work vii. Range of muscle work viii. Two joint muscle work ix. Active and passive insufficiency x. Group movement of joints xi. Muscular weakness and paralysis 	5	2
VIII. Techniques Of Strengthening Muscles	4	0

i.	Overview of techniques of strengthening muscles by assisted, resisted and free exercises of all joints		
ii.	Muscles of Lower Limb		
iii.	Muscles of Upper Limb		
iv.	Muscles of Spine		
Total		30	6

Recommended Instructional / Reading Materials:

Text Books:

1. The principles of exercise therapy by: M. Dena Gardiner, 4th Edition.

Reference Books:

1. Practical exercise therapy by Margaret Hollis 3rd Ed. illustrated, reprint, Blackwell Scientific
2. Muscle function testing by: Cunningham and Daniel. 2nd, illustrated

KINESIOLOGY-II

Credit Hours: 4(3-1)

Learning Outcomes/Objectives:

1. Describe the ROM and types of movements & exercises.
2. Differentiate among agonists, antagonists, and synergists integrating the knowledge learned with human motion occurring during daily activities.
3. Demonstrate relaxation techniques, derived positions and effective use of walking aids.
4. Demonstrate coordinated and uncoordinated movements
5. Demonstrate relaxation techniques, derived positions and effective use of walking aids.
6. Demonstrate coordinated and uncoordinated movements

Course Content	MCQs	SEQs	OSPEs
TYPES OF MOVEMENT & EXERCISES			
I. Active Movement: <ol style="list-style-type: none"> i. Voluntary & involuntary movements ii. Active and Passive movements iii. Classification & techniques of free exercises iv. The principles, techniques and effects of assisted exercises v. The principles, techniques and effects of assisted resisted exercises vi. The principles, types, techniques and effects of resisted exercises vii. Variation of the power of the muscles in different parts of their range viii. Progressive Resistance Exercise ix. Reflex movement x. The reflex arc xi. The stretch reflex xii. The righting reflexes xiii. The postural reflexes xiv. Effects and uses of reflex movement 	6	1	
II. Passive Movement <ol style="list-style-type: none"> i. The principles, types, techniques and effects of passive exercises ii. Definition of Passive manual mobilization and manipulations iii. Controlled sustained stretching, Principles and Effects and uses 	2	1	
III. Joint Mobility <ol style="list-style-type: none"> i. Explain joint mobility, structural features of joint and classification of joints 	5	1	

<ul style="list-style-type: none"> ii. Explain the causes and factors of limitation of joint range of movement iii. Explain the prevention of joint stiffness iv. Recall the mobilizing methods and active method 			
<p>IV. Techniques of Mobilizing Joints</p> <ul style="list-style-type: none"> i. Overview of relaxed passive movement, assisted movements and free exercises of all joints ii. Joints of the Lower Limb iii. Joints of the Upper Limb iv. Joints of the Vertebral Column 	5		0.5
<p>V. Relaxation</p> <ul style="list-style-type: none"> i. Definition ii. Muscle tone iii. Postural tone iv. Voluntary movement v. Mental attitudes vi. Degrees of relaxation vii. Pathological tension in the muscles viii. Technique ix. General relaxation x. Local relaxation 	5	1	
<p>VI. Suspension Therapy</p> <ul style="list-style-type: none"> i. Suspension application ii. Suspension concept of inclined planes iii. The fixed-point suspension iv. Supporting rope and its types v. Sling and its types vi. Type of suspension: axial & vertical vii. Methods, techniques of suspension: upper limb & lower limb viii. Suspension effect on muscle work and joint mobility 	5	1	
<p>VII. Neuromuscular Co-Ordination</p> <ul style="list-style-type: none"> i. Coordinated movement ii. Group action of muscles iii. Nervous control iv. Inco-ordination v. Re-Education vi. Frenkel's exercises. 	6	1	01
<p>VIII. Proprioceptive Neuromuscular Facilitation</p> <ul style="list-style-type: none"> i. Introduction to neuromuscular facilitation ii. Proprioceptive neuromuscular facilitation; define, explain and apply basic techniques of PNF and also techniques of emphasis of PNF which includes: Repeated 	6	1	

contractions, slow reversals, rhythmic stabilizations, hold-relax, rhythmic initiation.			
IX. Walking Aids i. Crutches ii. Sticks iii. Tripod or Quadra pod iv. Frames	5	1	0.5
MANUAL MUSCLE TESTING			
X. Manual Muscle Testing Laboratory Work i. Manual muscle testing - Regional Upper limb muscle testing ii. Manual muscle testing - Regional Lower limb muscle testing iii. Manual Muscle testing-Spine		1	01
Total	45	09	03

Recommended Instructional / Reading Materials:

1. The principles of exercise therapy by: M. Dena Gardiner, 4th Edition.
2. Muscle function testing by: Cunningham and Daniel. 2nd, illustrated
3. Practical exercise therapy by M.Hollis (for suspension therapy)

Assessment

ASSESSMENT/EXAMINATIONS

The scheme of assessment shall be as under:

S. #	Assessments	Weightage
1.	Mid-semester Examination	15%
2.	Class Performance (quiz/class test/presentations/ assignments)	5%
3.	Final Examination	80%

1. INTERNAL ASSESSMENT:

- a. The internal assessment shall be done by the institution/department.
- b. The internal assessment for each semester in each subject shall be assessed through;

S. #	Internal assessment method	Number per semester	Maximum marks	Total marks
1	Quizzes/class tests	02	5 per Quiz/class test	10
2	Assignments	02	5 per assignment	10
3	Presentation	01	5 per presentation	5

- c. The Institution/Department shall ensure that cognitive and psychomotor domains are assessed through internal assessment.

2. Mid- Semester Examination:

- a. The mid-semester examination shall be held in the 9th week of the semester.
- b. The schedule/date sheet of mid-semester examination shall be notified by the concerned head of the department, two weeks before the commencement of examination, in accordance with the notified academic calendar.
- c. The Question Paper of mid-semester examination shall be prepared by the relevant faculty member not below the rank of Assistant Professor and approved by the Head of Department.
- d. The mid-semester examination shall be conducted by the relevant academic department.
- e. The candidate shall be required to attempt all the Questions given in mid-semester examination. There shall be no choice.
- f. Result of mid-term examination shall be a mandatory requirement for appearance in the final term examination. The candidates shall be required to pass the mid-term examination by scoring at least 50% marks.
- g. The result of mid-term examination shall be declared within 07 days after

conclusion of the examination and it shall be submitted to the University same day in case of departments/institutions located in Lahore and within 24 hours in case of departments/institutions located outside the Lahore.

- h. The answer books of mid-semester examination shall be shown to the students and taken back immediately. The answer books shall only be shown to the students on the announced day failing which the student cannot claim to be shown the answer book.
- i. The Answer Books shall be kept as a record for two years in the concerned Department. The University reserves the right to seek submission of solved answer books/record of mid-term examination as and when required.

3. Final Examination

- a. The schedule/date sheet of final examination shall be notified by the UHS Examination Department in accordance with the notified Academic Calendar.
- b. The Examination Department of the University shall hold the final examination.

4. Format of Mid-Semester & Final Examination

- a. Mid-Semester Examination shall comprise of only Theory Examination.
- b. Final Examination of Semester shall consist of Theory and Practical Examinations in subjects where Cognitive and Psychomotor domains are to be assessed whereas only Theory Examination will be given in subjects where Cognitive domain is to be assessed in isolation.
- c. The student shall be required to submit a Research Project in the Final Semester of the Program. The Research Project shall be allocated by the Head of Department. The Research Project can be allocated to a group of students. The group shall comprise a maximum of 5 students.
- d. The research project shall be evaluated by an External Examiner and each student shall appear before the External Examiner for taking the Viva Voce examination based on Research Project.

5. GRADING:

- i. The subject wise grading system as **appended at II** will be followed for the grading of the students.
- ii. Minimum Qualifying **CGPA Required for the Completion of Undergraduate Degree shall be 2.**

6. INDISCIPLINE / USE OF UNFAIR MEANS IN EXAMINATIONS:

Any candidate found guilty of using unfair means in the Examinations shall be dealt under the Regulations for Examinations pertaining to Use of Unfair Means.

7. ADMISSION OF STUDENT TO SEMESTER EXAMINATION:

A student shall be allowed to take the final examination of each semester provided;

- i. His/her admission has been sent by the Head of Department/Institution on the prescribed form/medium within due date.

- ii. The Head of Department/Institution has certified that he/she has attained 80% attendance in the course to be examined. The attendance for each course is to be submitted specifically and separately.
- iii. The Head of Department/Institution has submitted certified result of Mid-Term Examination.
- iv. The Head of Department/Institution has submitted the Internal Assessment Score.
- v. The evidence for payment of prescribed fee to take examination has been attached / furnished.

ASSESSMENT OF PERLs MODULE

The scheme of assessment shall be as under:

Sr. No.	Assessments	Weightage
1.	Mid-semester Examination (OSCE)	15%
2.	Internal assessment (Portfolio entry)	5%
3.	Final Examination (OSCE + Portfolio)	80%

1. MID-SEMESTER & INTERNAL ASSESSMENT:

- The Mid-semester & Internal assessment shall be done by the institution/department.
- The internal assessment for each semester in each subject shall be assessed through;

Sr. No	Internal assessment method	Number of entries per semester	Marks per entry	Total marks
1	Portfolio entry	4	5 Marks	20

2. MID SEMESTER EXAMINATION:

- The mid-semester examination shall be held in the 9th week of the semester.
- The mid-semester examination shall be conducted by the relevant academic department.
- Result of mid-term examination shall be a mandatory requirement for appearance in the final term examination. The candidates shall be required to pass the mid-term examination by scoring at least 50% marks.

3. FINAL EXAMINATION

- The schedule/date sheet of final examination shall be notified by the UHS Examination Department in accordance with the notified Academic Calendar.
- The Examination Department of the University shall hold the final examination.

Course Credit Hours	Total Course Credit Hours	OSCE in Final term (60%)	Portfolio entries (20%)
1+0	1	3	8 Portfolio entries

Portfolio must be presented at the time of Mid & final term Viva

Mid & Final term Assessment of PERLs Module

Course Credit Hours	Total Course Credit Hours	OSCE in Mid term (15%)	Internal Assessment (5%)	OSCE in Final term (60%)	Portfolio entries (20%)
1+0	1	3	4 Portfolio entries	3	8 Portfolio entries