PHD
HEMATOLOGY

LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES, JAMSHORO

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ABOUT LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES, JAMSHORO

Located in the province of Sindh on the right bank of river Indus at Jamshoro. It is 160 km north from the port city of Karachi and 16 km from the historical city of Hyderabad.

From 1951 to 2001 (50 years) Liaquat University of Medical & Health Sciences was known as Liaquat Medical College, Jamshoro

VISION STATEMENT:

Liaquat University of Medical & Health Sciences seeks to be a top-tier healthcare institution, producing ingenious academic leaders, medical researchers, and healthcare advocates to serve global community.

MISSION STATEMENT:

Fostering ideal learning environment to ensure modern scientific evidence based practices by imparting critical knowledge, analytical and psychomotor skills, and professional dedication among healthcare students, under the umbrella of virtuous professional, moral and ethical standards.

PROGRAM OVERVIEW

Title of the Program: Doctor of Philosophy (PhD) in Hematology

Affiliated Department and Institution: Department of Pathology, Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro

Duration: 3 5 years (extendable up to 8 years as per HEC policy)

Mode of Study: Full-time

INTRODUCTION:

The PhD in Hematology is an advanced academic and research program offered by the Department of Pathology at Liaquat University of Medical & Health Sciences (LUMHS), designed to prepare scholars for leadership roles in hematologic research, diagnostics, education, and policy-making. The program is aligned with the university's mission to foster an ideal learning environment that promotes modern, evidence-based scientific practice, develops critical knowledge, and inculcates professional, ethical, and analytical competence in healthcare professionals.

In line with LUMHS's mission of promoting scientific excellence under virtuous professional, moral, and ethical standards, the PhD Hematology program is committed to developing professionals who possess not only the technical and analytical expertise in hematologic sciences but also the psychomotor and decision-making skills required for autonomous clinical and academic practice. The PhD in Hematology emphasizes the university's social accountability by:

- Encouraging research on hematologic diseases prevalent in underserved and high-risk populations.
- Training scholars to work across academic, clinical, and public health settings.
- Equipping graduates to practice independently as researchers, educators, laboratory consultants, and policy advocates in both national and international contexts.

This program responds directly to the healthcare challenges in Pakistan, where hematologic disorders such as thalassemia, hemophilia, anemia, leukemia, and transfusion-related complications pose significant burdens on the public health system. By focusing on context-specific research and diagnostic innovations, the curriculum addresses these pressing issues while cultivating a culture of lifelong learning, academic inquiry, and community impact.

MISSION OF THE PROGRAM

"To develop highly skilled, ethically grounded hematology scholars capable of conducting independent, impactful research, providing expert diagnostic consultation, contributing to academic excellence, and addressing the hematological health priorities of Pakistan through socially accountable and evidence-driven solutions."

PROGRAM OUTCOMES

The PhD in Hematology program is designed to produce highly competent scholars equipped with advanced scientific knowledge, practical expertise, and ethical integrity to lead transformative progress in hematology at academic, clinical, and policy-making levels. The Competency-Based Program Learning Outcomes (PLOs) of the PhD in Hematology are:

COGNITIVE DOMAIN OUTCOMES

- Demonstrate in-depth knowledge of normal and pathological hematopoiesis, blood cell physiology, immunohematology, and transfusion science.
- Critically evaluate current scientific literature and apply evidence-based practices to address complex hematologic problems.
- Design independent, original research that contributes to the understanding or advancement of hematological sciences.
- Analyze and interpret complex datasets using appropriate statistical and bioinformatics tools.
- Integrate theoretical concepts with clinical and laboratory applications to solve local, national, and global hematological issues.

SKILLS DOMAIN OUTCOMES (APPLIED COMPETENCIES)

- Perform advanced laboratory procedures including molecular diagnostics (PCR, FISH), flow cytometry, and cytogenetics relevant to hematology.
- Operate and maintain hematology equipment with adherence to biosafety and quality control standards.
- Develop and defend a doctoral research project, including proposal writing, data analysis, thesis submission, and publication.
- Communicate scientific findings effectively through presentations, peer-reviewed publications, and community engagement.

- Apply laboratory management and leadership skills, including audit processes, personnel training, and accreditation compliance.

BEHAVIOR / ATTITUDE DOMAIN OUTCOMES

- Exhibit ethical and professional conduct in all academic, research, and clinical activities, following national and international biomedical guidelines.
- Demonstrate accountability and responsiveness to the health needs of Pakistan, especially underserved populations, through research and service.
- Promote interdisciplinary collaboration, teamwork, and mentoring in laboratory, academic, and community settings.
- Engage in lifelong learning and professional development to maintain competence in hematology and related sciences.
- Advocate for quality healthcare and research integrity, contributing to national health policy and capacity building in hematology.

GENERIC (CROSS-DISCIPLINARY) COMPETENCIES

These are advanced-level competencies expected from all PhD scholars, regardless of discipline:

1. **Research Design & Methodology**
    - Formulate original, hypothesis-driven research questions and apply appropriate methodological frameworks.
2. **Academic Communication**
    - Demonstrate advanced scientific writing and oral presentation skills for peer-reviewed journals, conferences, and thesis defense.
3. **Critical Thinking & Problem-Solving**
    - Critically evaluate literature, identify gaps, and propose logical, evidence-based solutions to scientific problems.
4. **Data Analysis & Interpretation**
    - Apply biostatistical and computational tools to analyze complex datasets and draw valid conclusions.
5. **Ethical Conduct in Research**
    - Uphold integrity in research involving human or biological materials, ensuring compliance with ethical standards (IRB, biosafety, authorship, plagiarism).
6. **Professionalism and Leadership**
    - Exhibit professionalism, time management, and responsible conduct in academic and research environments.
7. **Lifelong Learning & Self-Development**
    - Continuously update knowledge, skills, and professional practices through ongoing learning and reflective thinking.

HEMATOLOGY FOCUSED SPECIFIC COMPETENCIES

These are advanced technical and conceptual competencies tailored to the discipline of hematology:

1. **Advanced Hematologic Knowledge**
    - Demonstrate in-depth understanding of hematopoiesis, blood cell biology, hemostasis, transfusion medicine, and hematologic disorders (benign and malignant).
2. **Diagnostic and Laboratory Expertise**
    - Competently perform and interpret advanced laboratory tests including molecular diagnostics, cytogenetics, and flow cytometry relevant to hematology.
3. **Transfusion and Immunohematology**
    - Manage transfusion protocols, crossmatching, blood typing, and monitor for transfusion-related complications and alloimmunization.
4. **Bone Marrow and Hematopathology Interpretation**
    - Interpret bone marrow aspirates, biopsies, and peripheral smears with integration of clinical findings.
5. **Application to Local/National Health Priorities**
    - Design and conduct hematologic research addressing endemic conditions like thalassemia, hemophilia, leukemias, and nutritional anemias prevalent in Pakistan.
6. **Scholarly Dissemination**
    - Publish original research in indexed hematology journals and participate in academic forums to advance the field.
7. **Capacity Building in Hematology**
    - Contribute to workforce development, laboratory quality assurance, and academic mentorship within hematology departments or national programs.

CURRICULUM DEVELOPMENT AND APPROVAL PROCESS

The curriculum for the Ph.D. Hematology program was initially drafted by the faculty members of the Department of Pathology, Liaquat University of Medical & Health Sciences (LUMHS). The draft was prepared in alignment with national academic standards and international trends in Hematology.

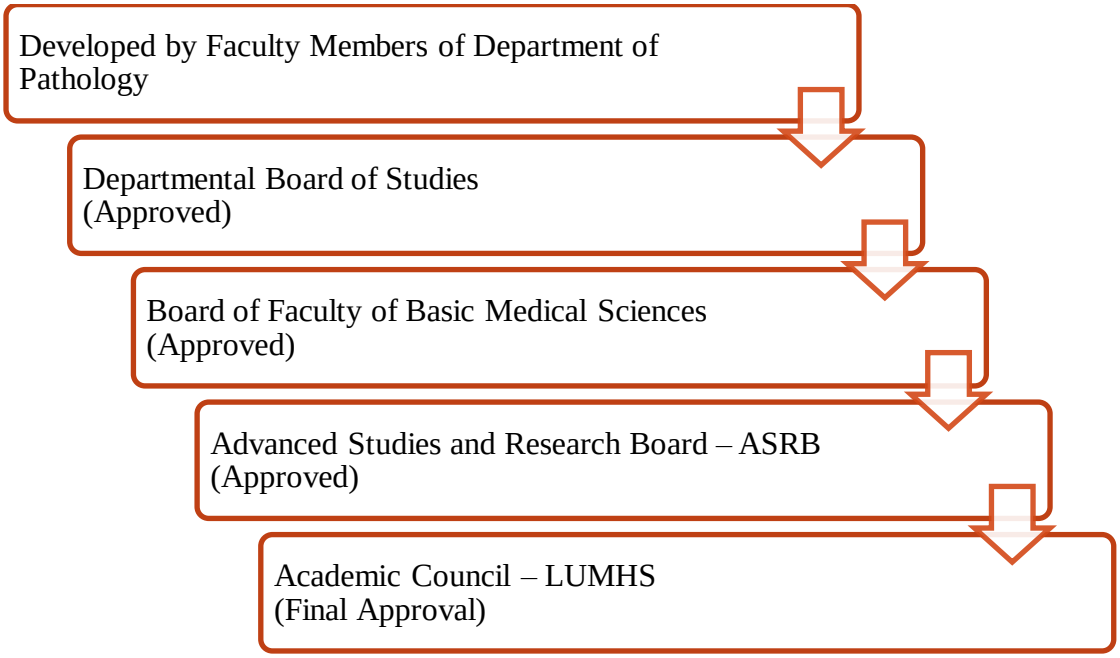
Following internal deliberations, the draft curriculum was presented to the Board of Studies (BoS) of the Department of Pathology. After thorough review and necessary revisions, the BoS approved the curriculum.

Subsequently, the curriculum was submitted to the Board of Faculty of Basic Medical Sciences, where it was evaluated and endorsed after academic vetting.

The endorsed curriculum was then forwarded to the Advanced Studies and Research Board (ASRB). The ASRB approved the curriculum, ensuring it met postgraduate and research standards.

Finally, the curriculum was presented to the Academic Council of LUMHS, which granted final approval for implementation.

APPROVAL FLOWCHART



ADMISSION REQUIREMENTS

Admission to the PhD in Hematology program at LUMHS is governed by the regulations of the Higher Education Commission (HEC), Pakistan, and institutional postgraduate policies. The criteria are designed to ensure that only academically prepared, research-oriented, and professionally committed candidates are enrolled into the program.

ELIGIBILITY CRITERIA:

1. **Academic Qualifications:**
    - M.Phil or equivalent postgraduate degree (FCPS) in Hematology, Pathology, or a related discipline from an HEC-recognized university.
    - Minimum CGPA of 3.0/4.0 in the semester system or First Division in the annual system.
2. **Professional Background (if applicable):**
    - Preference given to candidates with relevant teaching, diagnostic laboratory, or research experience.
    - Valid professional (PMDC) registration.

ENTRANCE TEST:

- All applicants must appear in the PhD Admission Test conducted by LUMHS or submit a valid HEC-approved test score (e.g., GAT-Subject).
- A minimum of 70% marks is required to qualify.
- The test assesses subject-specific knowledge, analytical reasoning, and research aptitude.

INTERVIEW / RESEARCH SYNOPSIS DISCUSSION:

- Shortlisted candidates based on test scores will be called for a panel interview.
- The interview evaluates:
    - Academic and research motivation
    - Conceptual understanding of hematology
    - Communication and critical thinking skills
    - Preliminary research interests or proposed research ideas

ADDITIONAL REQUIREMENTS:

- NOC (No Objection Certificate) from the employer (if employed)

FINAL SELECTION:

- Based on cumulative merit, including academic performance, entrance test results, interview score, and availability of supervisors and research slots.
- Admission is finalized by the PG Selection Committee at LUMHS.

CREDIT HOUR STRUCTURE

- **Total:** 56 credit hours
    - **Coursework:** 18 credit hours + 02 credit Hours *Fahm-ul-Quran*
    - **Research (Thesis):** 36 credit hours

COURSEWORK CONTENT (18 CH)

In accordance with HEC and institutional requirements, PhD scholars must complete a minimum of 18 credit hours (CH) of advanced coursework during the first year of the program. The coursework is designed to enhance discipline-specific expertise, research methodology, and academic professionalism.

CURRICULUM MAP

1ST SEMESTER COURSES (9 CH TOTAL)	2ND SEMESTER COURSES (9 CH TOTAL)
Course 1: Advanced Research Methodology (2+1 CH)	Course 4: Advanced Hematological Disorders (2+1 CH)
Course 2: Biostatistics and (2+1 CH)	Course 5: Malignant Hematological Disorders (2+1 CH)
Course 3: Advanced Laboratory Techniques (1+2 CH)	Course 6: Transfusion Medicine and Immunohematology (2+1 CH)

PLAN OF PH.D PROGRAM

STUDY GUIDE

SEMESTER-WISE COURSE STRUCTURE AND DETAILS

Each Semester: 9 CH (Theory + Practical/Lab)

1ST SEMESTER COURSES (9 CH TOTAL)

COURSE 1: ADVANCED RESEARCH METHODOLOGY (2+1 CH)

This course builds advanced competencies in health research planning, methodological rigor, and evidence-based inquiry. Emphasis is placed on formulating researchable questions, selecting appropriate designs, and understanding ethical requirements.

Course Outcomes:

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

1. Formulate relevant and feasible research questions.
2. Select appropriate quantitative and qualitative designs.
3. Apply advanced sampling and data collection techniques.
4. Evaluate validity and reliability in research.
5. Prepare detailed research protocols and grant proposals.
6. Analyze the role of research ethics and regulatory bodies.

Topics of Study:

- Philosophies and types of research
- Research question formulation & hypothesis development
- Study designs: RCTs, cohort, case-control, qualitative designs
- Sampling strategies and sample size calculation
- Data collection tools and protocol development
- Research ethics, IRB/IERC processes
- Literature review techniques (PRISMA, MeSH)
- Proposal writing and peer review process

COURSE 2: BIOSTATISTICS (2+1 CH)

This course equips scholars with statistical tools for analysis and epidemiologic skills for interpreting health data. It integrates statistical software with real-world medical data applications.

Course Outcomes:

1. Describe types of epidemiological studies and their applications.
2. Compute descriptive and inferential statistics.
3. Use statistical software (SPSS/R) for analysis.
4. Interpret p-values, confidence intervals, and regression models.
5. Assess risk ratios, incidence/prevalence, and diagnostic test validity.
6. Design epidemiological studies with statistical validity.

Topics of Study:

- Epidemiologic measures (incidence, prevalence, RR, OR)
- Study designs in epidemiology
- Descriptive statistics: mean, SD, proportions
- Inferential statistics: t-tests, chi-square, ANOVA
- Regression models: linear, logistic, Cox
- ROC curves and diagnostic test evaluation
- Use of SPSS or R for data analysis
- Critical appraisal of published data

COURSE 3: ADVANCED LABORATORY TECHNIQUES (1+2 CH)

This hands-on course emphasizes practical laboratory competencies and familiarity with advanced hematology lab equipment, biosafety, and diagnostic technologies.

Course Outcomes:

1. Demonstrate proficiency in blood sample processing and preservation.

2. Operate automated hematology analyzers and flow cytometers.
3. Execute ELISA, PCR, and cytogenetic procedures.
4. Maintain documentation and internal/external QC logs.
5. Apply biosafety, biosecurity, and lab waste management principles.
6. Troubleshoot common lab errors and equipment calibration.

Topics of Study:

- Sample collection, anticoagulants, pre-analytical errors
- Hematology analyzers, smear preparation, differential counts
- ELISA, Western blotting, PCR, electrophoresis
- Cytogenetics and fluorescence microscopy
- Flow cytometry basics and gating principles
- Biosafety levels, universal precautions, and quality assurance
- NABL/ISO15189 documentation, SOPs, audits

2ND SEMESTER COURSES (9 CH TOTAL)

COURSE 4: ADVANCED HEMATOLOGICAL DISORDERS (2+1 CH)

This course provides an in-depth understanding of pathogenesis, diagnosis, and management of non-malignant hematologic disorders, integrating molecular and morphological features.

Course Outcomes:

1. Classify and describe non-malignant RBC, WBC, and platelet disorders.
2. Interpret diagnostic tests (electrophoresis, retic count, osmotic fragility).
3. Correlate genetic and molecular findings with clinical presentations.
4. Discuss evidence-based treatment strategies.
5. Analyze case-based scenarios with differential diagnosis.

6. Review guidelines for rare hematologic syndromes.

Topics of Study:

- Anemias: iron deficiency, megaloblastic, aplastic, hemolytic
- Thalassemia and sickle cell disease: molecular basis
- Neutropenia, eosinophilia, leukemoid reactions
- Platelet function disorders and thrombocytopenia
- Bone marrow failure syndromes and inherited cytopenias
- Diagnostic markers, lab algorithms, and treatment pathways

COURSE 5: MALIGNANT HEMATOLOGICAL DISORDERS (2+1 CH)

This course focuses on malignant hematological diseases, covering leukemia, lymphoma, myeloma, and associated cytogenetic and molecular abnormalities.

Course Outcomes:

1. Identify and classify hematologic malignancies using WHO criteria.
2. Interpret diagnostic findings including cytogenetics and flow cytometry.
3. Correlate chromosomal aberrations with prognosis and therapy.
4. Design diagnostic and monitoring strategies for MRD.
5. Critically appraise literature on targeted therapies and immunotherapy.
6. Develop a research question addressing gaps in malignant hematology.

Topics of Study:

- Acute and chronic leukemias (ALL, AML, CML, CLL)
- Myeloproliferative disorders
- Hodgkin and Non-Hodgkin lymphomas
- Plasma cell disorders (myeloma, MGUS)
- Myelodysplasia

- Cytogenetics (t(9;22), t(15;17), del13q) and gene profiling
- Minimal Residual Disease (MRD) and targeted therapies
- Flow cytometry and molecular diagnostics
- Role of bone marrow transplant in malignancy

COURSE 6: TRANSFUSION MEDICINE AND IMMUNOHEMATOLOGY (2+1 CH)

This course addresses the science and clinical practice of blood transfusion, blood banking, and immunohematological compatibility testing.

Course Outcomes:

1. Explain ABO, Rh, and minor blood group systems.
2. Perform crossmatching and antibody screening.
3. Manage transfusion reactions and alloimmunization.
4. Understand blood component preparation and storage.
5. Apply transfusion protocols in special populations (neonates, oncology).
6. Evaluate policies for hemovigilance and blood safety.

Topics of Study:

- Blood group serology and genotyping
- Compatibility testing and crossmatch protocols
- Hemolytic disease of the fetus and newborn (HDFN)
- Blood component therapy: indications and storage
- Transfusion-transmitted infections and screening
- Massive transfusion protocol and patient blood management
- Immunohematology audits, adverse event reporting
- Quality Management of Blood Banking

TEACHING METHODOLOGIES:

- Interactive Lectures
- Case-Based Learning (CBL)
- Problem-Based Learning (PBL)
- Hands-on Practical Lab Work
- Seminars & Journal Clubs
- Supervisor-Guided Research Time
- Workshops & Simulations
- Self-Directed Learning (SDL)

RECOMMENDED OPTIONAL WORKSHOPS FOR PHD HEMATOLOGY

- Academic Writing and Scientific Communication
- Effective Oral and Poster Presentation Skills
- Plagiarism, Referencing, and Turnitin Use
- Peer Review and Publishing Ethics
- Bioethics in Biomedical Research
- Biosafety and Laboratory Risk Management
- Professionalism and Work Ethics in Research
- Communication Skills for Academic Leadership
- Curriculum Vitae (CV) Building and Career Development
- Teaching Methodologies for Higher Education

WEEKLY TIMETABLE – 1ST SEMESTER (9 CH)

Courses:

- Advanced Research Methodology (2+1 CH)
- Biostatistics (2+1 CH)
- Advanced Laboratory Techniques (1+2 CH)

Timings: Monday to Friday | 8:30 AM to 2:00 PM

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–09:30 AM	Lecture: Research Methodology (Interactive Lecture)	Lecture: Biostatistics (Problem-Based Learning)	Journal Club (Critical Appraisal)	Lecture: Epidemiology (Blended Learning)	Lecture: Advanced Lab Techniques (Case-Based Discussion)
09:30–10:30 AM	Practical: Research Design (Small Group Work)	Practical: SPSS Lab (Hands-on)	Practical: Sample Prep (Lab Demonstration)	Practical: Statistical Modeling (Computer Lab)	Self-Study / Literature Review
10:30–11:00 AM	**Break**	**Break**	**Break**	**Break**	**Break**
11:00–12:00 PM	Seminar: Ethics in Research (Seminar)	Practical: Data Interpretation (Group Task)	Practical: PCR/ELISA Techniques (Lab)	Workshop: Epidemiologic Study Design (Facilitated)	Practical Catch-up (Open Lab)
12:00–01:00 PM	Case Discussion: Errors in Research (Problem-Solving)	Self-Study / Library	Lab Quality Control (Lab Tutorial)	Research Proposal Work (Supervisor Guided)	Supervisor Meeting / Feedback
01:00–02:00 PM	Self-Study / SPSS Practice	Supervisor Discussion	Biostatistics Review Session (Peer-led)	Self-Study	Weekly Research Progress Note (Documentation)

WEEKLY TIMETABLE – 2ND SEMESTER (9 CH)

Courses:

- Advanced Hematological Disorders (Non-Malignant) (2+1 CH)
- Malignant Hematological Disorders (2+1 CH)
- Transfusion Medicine and Immunohematology (2+1 CH)

Timings: Monday to Friday | 8:30 AM to 2:00 PM

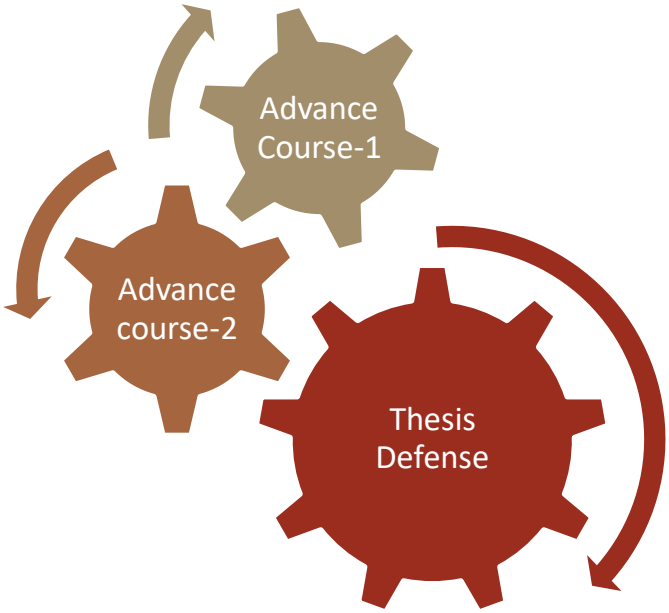
Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30–09:30 AM	Lecture: Non-Malignant Disorders (Pathophysiology Focus)	Lecture: Transfusion Medicine (Case-Based)	Journal Club (Article Review)	Lecture: Immunohematology (Interactive)	Lecture: Malignant Disorders (WHO Classification)
09:30–10:30 AM	Lab: Anemia Diagnosis (Hands-On)	Blood Grouping & Crossmatch (Lab)	Flow Cytometry Practice (Hands-On)	BMT & Immunotherapy (Group Presentation)	Self-Study (Topic Review)
10:30–11:00 AM	**Break**	**Break**	**Break**	**Break**	**Break**
11:00–12:00 PM	Multidisciplinary Case Review (Integrated)	Lab: Coagulation Panels (Demo + Practice)	Seminar: Leukemia Cytogenetics (Expert Session)	Workshop: Transfusion Protocols (Simulation)	Lab Catch-up (Open Lab)
12:00–01:00 PM	Supervisor-Guided Literature Review	Self-Study (Library Session)	Tumor Board Observation (Clinical Exposure)	Group Case Discussion (Malignancies)	Thesis Idea Brainstorming (Supervisor Input)
01:00–02:00 PM	Supervisor Meeting / Progress Notes	Self-Study / Proposal Work	Clinical Scenario Solving (Interactive)	Lab Documentation & Audit Prep	Research Writing Time

ASSESSMENT STRATEGIES AND EXAMINATION POLICY

The assessment system supports learning, monitors progress, ensures academic rigor, and reflects expected outcomes in the cognitive, psychomotor, and affective domains. It incorporates both formative and summative methods and adheres to principles of validity, reliability, transparency, and fairness.

The PhD Hematology program follows a rigorous, multi-stage evaluation framework to ensure academic excellence, research integrity, and professional readiness. The examination system includes coursework assessment, comprehensive examination, research evaluation, and thesis defense. The formal examination system of the PhD Hematology program is divided into three sequential parts aligned with the academic structure and research trajectory of the scholar. The system ensures rigorous evaluation of coursework, practical competencies, and research excellence.

ASSESSMENT MAP:



ASSESSMENT PATTERN:

Each semester comprises three courses, assessed through a combination of written examinations and continuous internal evaluation. Examinations are designed to test cognitive knowledge, analytical ability, and applied understanding in line with course outcomes. For each course:

- Internal Assessment: Assignments, Teaching to M.Phil students and presentation of research work.
- **Final Examination includes:**
    - 50 Best Choice Questions (BCQs) – 1 mark each (Total: 50 marks)
    - 5 Short Answer Questions (SAQs) – 10 marks each (Total: 50 marks)

- **Practical & Viva Voce:**
    - Practical exam involving diagnostic tasks, research-based case applications
    - Structured viva assessed by internal faculty

PASSING CRITERIA:

- Minimum 70% marks in each exam

SEMESTER 1 – TABLE OF SPECIFICATION (TOS)

TOTAL: 50 BCQS + 5 SAQS = 100 MARKS

Course	Topic	BCQs	Weightage	SAQs	Cognitive Levels
Advanced Research Methodology (35%)	Research design & hypothesis	6	12%	1	Understanding, Application
	Sampling & tools	5	10%	0	Application, Analysis
	Validity & bias	4	8%	0	Analysis, Evaluation
	Ethics and IRB	3	6%	0	Application, Evaluation
Biostatistics & Epidemiology (35%)	Descriptive/inferential stats	6	12%	1	Knowledge, Application
	Hypothesis testing, CI	5	10%	0	Application, Analysis
	Regression/ANOVA/survival	4	8%	0	Evaluation, Interpretation
	Study design & bias	3	6%	0	Evaluation
Advanced Laboratory Techniques (30%)	Hematology analyzer, smears	5	10%	1	Skill, Application
	ELISA, PCR, electrophoresis	5	10%	1	Interpretation, Analysis
	Biosafety, SOPs	2	4%	0	Knowledge
	Troubleshooting lab errors	2	4%	1	Synthesis, Problem-solving

SEMESTER 2 – TABLE OF SPECIFICATION (TOS)

TOTAL: 50 BCQS + 5 SAQS = 100 MARKS

Course	Topic	BCQs	Weightage	SAQs	Cognitive Levels
Advanced Hematologic Disorders (Non-Malignant) (35%)	Iron def., megaloblastic anemia	6	12%	1	Knowledge, Application
	Hemoglobinopathies & thalassemia	5	10%	0	Application, Analysis
	Platelet/neutrophil disorders	4	8%	0	Problem-solving
	BM failure syndromes	3	5%	0	Application
Malignant Hematologic Disorders (35%)	Leukemias	6	12%	1	Diagnosis, Interpretation
	Lymphomas	5	10%	0	Interpretation, Application
	Myeloma	4	8%	0	Analysis
	Cytogenetics/molecular diagnostics	3	5%	0	Synthesis
Transfusion Medicine & Immunohematology (30%)	ABO/Rh typing & crossmatch	6	12%	1	Practical Knowledge
	Transfusion reactions & hemovigilance	5	10%	0	Analysis, Safety
	Blood component therapy	4	8%	0	Application
	Donor screening, TTI	2	7%	1	Evaluation, Ethics

ELIGIBILITY FOR RESEARCH PHASE:

- Successful completion of all 6 coursework modules (total 18 CH)
- Clearance of Comprehensive Examination after Year 1

THESIS RESEARCH AND DEFENSE (YEARS 2–3)

RESEARCH PROCESS POLICY

Research is the cornerstone of the PhD in Hematology program. This section outlines a structured process from proposal development to thesis defense, ensuring scientific rigor, ethical compliance, and scholarly contribution to the field of hematology.

1. RESEARCH PROPOSAL DEVELOPMENT AND APPROVAL

Timeline:

- The PhD scholar must submit a detailed research synopsis within the first 06–12 months after enrollment and successful completion of coursework and comprehensive exam.

Proposal Format:

- Title and rationale
- Objectives and hypotheses
- Review of literature
- Methodology (study design, sampling, data analysis)
- Ethical considerations
- Timeline and budget
- Referencing (Vancouver style)

Approval Process:

- Reviewed by Departmental Research Committee (DRC)
- Ethical clearance from Ethical Review Committee (ERC)
- Final approval by the Board of Advanced Studies and Research (ASRB)

2. CONDUCT OF RESEARCH

Duration:

- Minimum of 2-years post-coursework dedicated to full-time research

Monitoring:

- Biannual progress report
- Presentation at Research Seminars
- Periodic lab audits and supervisor evaluations

3. RESEARCH PUBLICATION REQUIREMENT

Publication Mandate:

- At least one original research article must be published or accepted in a HEC-approved X-category journal (publication in W Category journal is preferable) before thesis submission
- The scholar must be the first author
- Publication must be directly related to the PhD thesis work

Acceptable Journals:

- Recognized by HEC in X-category or above

4. THESIS SUBMISSION

Format:

- As per LUMHS/HEC PhD Thesis Guidelines

- Chapters: Introduction, Literature Review, Materials & Methods, Results, Discussion, Conclusion, References, Appendices
- Plagiarism check using Turnitin (must be <19%)

Supervisory Committee:

- One Principal Supervisor (approved PhD faculty)
- 1–2 Co-Supervisors (optional, based on research scope)
- Supervisor's certification required before submission

Evaluation Process:

- Thesis sent to three external reviewers (at least two would be international)
- Reviewed for originality, scientific merit, clarity, and relevance
- Corrections/revisions must be addressed within stipulated time

5. FINAL THESIS DEFENSE

Public Defense Components:

- Oral presentation (30–40 minutes)
- Q&A by examiners, faculty, and audience
- Final grading by panel by external and internal examiners

AWARD OF PHD DEGREE:

- Fulfillment of coursework + research requirements
- Approval of thesis by examiners and ASRB
- Final submission of hard and soft copies to LUMHS and HEC repository

PROGRAM GOVERNANCE & QUALITY ASSURANCE POLICY

The implementation of the PhD Hematology curriculum at Liaquat University of Medical & Health Sciences (LUMHS) follows a structured, phased approach aligned with institutional, HEC, and PMDC standards. The process begins with curriculum approval through the relevant bodies. Concurrently, orientation sessions are held for faculty and staff, while detailed course study guides and teaching resources are prepared. Faculty are assigned according to subject expertise, and laboratory infrastructure is reviewed for readiness. Following statutory bodies play a key role in implementation, governance and quality assurance of the PhD Hematology Curriculum:

1. Advanced Studies & Research Board (ASRB)

- Curriculum proposals, modifications, and faculty nominations are submitted to and approved by the Advanced Studies & Research Board.
- The ASRB ensures compliance with university statutes, HEC policies, and ethical standards (e.g., IRB/REC approvals).

2. Monitoring Student Progress & Supervisor Compliance

- Each student's journey is overseen by a designated supervisory team (principal + co-supervisor) approved by ASRB.
- Progress is tracked via biannual progress reports, attendance records, and supervisor attestations.
- The Research Ethics Committee (REC) monitors ethical compliance and regular progress reviews.
- ORIC facilitates research training, provides technical support, and ensures timely scholar development.

3. Quality Assurance Framework & Annual Self-Assessment

- The Quality Enhancement Cell (QEC) operates to maintain, promote, and enhance academic quality in postgraduate programs
- The PhD Hematology program undergoes an annual self-assessment, coordinated through QEC in collaboration with PGCC, which reviews curriculum, assessments, student outcomes, and stakeholder feedback.
- Identified gaps lead to targeted improvements in curriculum, teaching methodologies, supervision quality, and lab infrastructure.
- Periodic external peer reviews (via national/international examiners during thesis Defense) provide benchmarking and external validation. Regular Q'Con events highlight LUMHS's commitment to implementing quality standards across higher education.

LEARNING RESOURCES AND FACILITIES

The PhD in Hematology program at LUMHS is supported by a strong foundation of advanced academic resources, modern laboratories, and clinical integration, designed to facilitate high-level research and postgraduate education.

1. Laboratories and Diagnostic Facilities

- Well-equipped hematology laboratories with facilities for:
    - Complete Blood Count (CBC), ESR, and peripheral smear analysis
    - Bone marrow aspiration and biopsy processing
    - Coagulation profile testing (PT, APTT, D-dimer)
    - Hemoglobin electrophoresis and reticulocyte count

- Advanced instrumentation includes:
    - Automated hematology analyzers
    - Cytospin centrifuges
    - ELISA readers and PCR platforms
- Specialized labs for Molecular Hematology and Cytogenetics are available for research in genetic hematologic disorders and leukemia classification.

2. Animal Research and Experimental Facilities

- Access to the animal house facility at LUMHS for experimental hematology, approved by the Institutional Ethical Committee.
- Facilities for animal model development, drug testing, and translational research in hematologic malignancies or inherited anemias.

3. Clinical Exposure and Teaching Hospital Integration

- LUMHS is affiliated with Liaquat University Hospital and several tertiary-care centers for bedside training.
- Opportunities for PhD scholars to participate in:
    - Hematology outpatient clinics
    - Transfusion medicine services
    - Bone marrow transplant units
    - Case-based discussions and multidisciplinary team meetings

4. Research Support and IT Resources

- Access to Online Research Support Tools via ORIC and the university library:
    - Turnitin for plagiarism check
    - EndNote/Mendeleyev for reference management
    - SPSS, R, NVivo for data analysis

- Institutional access to HEC Digital Library, providing full-text access to:
    - PubMed, ScienceDirect, Springer, Wiley, and Nature
- Dedicated e-library with multimedia workstations and continuous internet access

5. Academic and Study Facilities

- Modern air-conditioned seminar rooms, conference halls, and PhD study spaces
- Regular journal clubs, seminars, CPCs (Clinico-Pathological Conferences), and grand rounds
- Structured mentorship by experienced faculty with international qualifications

6. Library

- Central Library with updated textbooks in hematology, pathology, molecular biology, and research ethics

LIST OF PRESCRIBED TEXTBOOKS

1. Postgraduate Haematology – 8th Edition (2023)
   Authors: A.V. Hoffbrand, D. Catovsky, E. Pettit, P.A.H. Moss
2. Williams Hematology – 10th Edition (2021)
   Authors: Kenneth Kaushansky, Marshall A. Lichtman, Josef T. Prchal
3. Dacie and Lewis Practical Haematology – 12th Edition (2017)
   Authors: Barbara J. Bain, Imelda Bates, Mike A. Laffan
4. Haemoglobinopathy Diagnosis – 3rd Edition (2020)
   Author: Barbara J. Bain
5. AABB Technical Manual – 20th Edition (2020)
   Publisher: American Association of Blood Banks
6. Bone Marrow Pathology – 5th Edition (2019)
   Author: Barbara J. Bain
7. Hoffbrand's Essential Haematology – 8th Edition (2019)
   Authors: A.V. Hoffbrand, P.A.H. Moss
8. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues – 5th Edition (2022)
   Publisher: IARC / WHO
9. Modern Blood Banking and Transfusion Practices – 7th Edition (2018)
   Author: Denise M. Harmening
10. Laboratory Medicine: Hematology – Latest standard references (based on current institutional use and access)
11. Rosai and Ackerman's Surgical Pathology – 11th Edition (2018)
    Editor: Juan Rosai

RECOMMENDED SCIENTIFIC JOURNALS

- Blood
- Transfusion Medicine
- British Journal of Haematology
- The Lancet
- New England Journal of Medicine (NEJM)
- Haemostasis and Thrombosis
- Seminars in Hematology
- American Journal of Clinical Pathology
- Journal of Laboratory and Clinical Medicine

ONLINE ACCESS VIA DIGITAL LIBRARY

PhD scholars at LUMHS can access these books and journals through:

- HEC Digital Library – LUMHS Portal
- Ebrary Digital Resources