Digital Health Diploma (DDH) for Medical Professionals

Course Outline

Program Overview

In today's rapidly evolving healthcare landscape, digital technologies are transforming medical practice globally. With the digital health market projected to reach $946 billion by 2030, growing at 22.2% annually, healthcare professionals need specialized training to harness these innovations effectively. Pakistan stands at a critical juncture where adopting digital health innovations can address significant healthcare challenges, improve access to care, and enhance health outcomes.

The Digital Health Diploma at LUMS offers a comprehensive, evidence-based curriculum designed for health professionals seeking to lead digital transformation in their practice settings. This six-month hybrid program follows the internationally recognized DECODE framework and equips participants with expertise in telehealth, electronic health records, data governance, and AI applications. Through balanced theoretical knowledge and hands-on skills development, physicians will be positioned to lead digital initiatives, improve workflows, and contribute to more accessible healthcare systems.

The diploma program builds a foundation for research in digital healthcare by equipping professionals with the skills to assess digital interventions. This will create new research opportunities and support for grant applications at LUMS. Through hands-on data analysis and AI tools, participants will generate evidence on the impact and challenges of digital health solutions in Pakistan. This research will help shape policy, improve healthcare delivery, and promote a more data-driven, equitable system.

The hybrid format allows medical professionals to balance clinical responsibilities while acquiring essential digital competencies. Graduates will be uniquely positioned to lead digital health initiatives, enhance patient care, and contribute to more efficient healthcare delivery in Pakistan.

- **Duration**: 1 year
- **Credit Hours**: 18
- **Mode**: Hybrid (both in-person and online participation is possible)
- **Target Audience**: Medical doctors and health professionals practicing in Pakistan
- **Prerequisites**: Active medical license in Pakistan; basic computer literacy
- **Weekly Commitment**: Approximately 6-8 hours per week.

Program Objectives

By the end of this diploma program, participants will be able to:

1. Apply digital health technologies ethically and effectively within the Pakistani healthcare context
2. Implement and evaluate telehealth services appropriate for their practice setting
3. Utilize health information systems and AI tools to improve patient care and clinical workflows
4. Analyze health data to support clinical decision-making and public health initiatives
5. Critically evaluate and implement AI and data science solutions in clinical practice
6. Develop a practical digital health implementation plan for their clinical environment
7. Demonstrate leadership and change management competencies essential for digital health adoption

Program Structure

The program's structure is based on the four domains of the Digital Health Competencies in Medical Education (DECODE) framework, with each domain covered in a separate module. DECODE, developed through an international collaboration of 211 experts from 79 countries and territories, is an evidence-informed, consensus-guided, adaptable digital health competencies framework for designing and developing digital health curricula in medical institutions globally.

Course 1: Overview & Preparing for Digital Health
1st Semester | 2 Credit Hours

1.1 **The Digital Revolution in Healthcare**

- What is digital health and why does it matter?
- Is healthcare on the verge of its greatest revolution since antibiotics?
- How might digital health finally deliver healthcare to the billions of people with inadequate access?
- What transformative innovations are reshaping healthcare delivery globally and locally?
- Will AI augment capabilities of doctors or replace them?

1.2 **Preparing for Digital Health Implementation**

- Digital health readiness assessment for clinical settings
- Change management strategies for digital health adoption
- Resource optimization in digital health deployment
- Measuring impact: frameworks for evaluating digital health interventions

1.3 **Digital Health in Pakistan's Context:**

- Digital health landscape and ecosystem in Pakistan
- Current challenges and opportunities in Pakistan's digital health space
- Data protection laws and implementation in Pakistani healthcare settings

Practical Components:

- Assessing AI literacy readiness
- Practical simulations/role-play exercises for AI as an augmentation tool
- Case studies of AI's role in healthcare contexts

Assignment: Develop and present AI integration strategies in clinical settings.

Course 2: Patient and Population Digital Health
1st Semester | 2 + 1 Credit Hours

2.1 **Digital health literacy**
- Assess digital health literacy among different healthcare stakeholders
- Strategies to address digital health inequalities (e.g., developing culturally sensitive materials for low-literacy and multilingual populations)
- Role of clinicians in guiding patients to trustworthy digital tools.

2.2 **Telehealth**
- Telehealth consultation skills and protocols
- Scope, capabilities, and limitations in Pakistani context
- Technical and administrative requirements
- AI-enhanced telehealth applications and case studies in resource-limited contexts

2.4 **Sensors, wearables, and internet of medical things**
- Introduction to the internet of medical things: types and uses
- Applications in patient monitoring for preventive care
- Data interpretation and clinical integration
- Implementation challenges in the Pakistani context

2.6 **Internet-based health interventions**
- Types and applications of online interventions
- Implementation for specific health conditions
- Effectiveness assessment methods

2.7 **Digital determinants of health**
- Define digital determinants (access, literacy, affordability, infrastructure).
- Examine their impact on health equity in Pakistan
- Strategies to bridge the digital divide in patient access and clinician workflows.
- Exercise: Clinicians analyse a case study (urban hospital vs rural clinic) and propose equity-focused interventions.

2.8 **Computational thinking in medicine**
- Problem decomposition and pattern recognition
- Algorithm design for clinical problems
- Data-driven decision making
- Automation of routine clinical tasks

Practical Components:
- Telehealth simulation exercises
- Evaluation of health apps appropriate for Pakistani patients
- Design of digital literacy materials for local context
- Stakeholder engagement sessions involving patients and community representatives.
- **Assignment**: Develop a telehealth implementation protocol for a specific patient population in Pakistan, incorporating appropriate digital tools and AI assistance

Course 3: Health Information Systems and Human Centered Design 1st and 2nd Semester | 3 + 1 Credit Hours
3.1 Digital Determinants of Health • Define digital determinants (access, literacy, affordability, infrastructure). • Examine their impact on health equity in Pakistan. • Strategies to bridge the digital divide in patient access and clinician workflows. • Exercise: Clinicians analyse a case study (urban hospital vs rural clinic) and propose equity-focused interventions. 3.1 Foundation and principles of health information systems • Types of Health Information Systems including EHR • Core components and architecture • Security and efficiency considerations • Common challenges in using EHRs in Pakistan. • Implementation strategies in Pakistani healthcare settings 3.2 Electronic health records • Appropriate use of EHR systems • Electronic prescribing best practices • Clinical documentation standards • AI-enhanced documentation and coding 3.2 Human-centered design in digital health • Designing and developing digital health interventions • Aligning system design with clinician workflows • Mechanisms to address social determinants of digital health access • Human-centered AI in digital Health and its impact for Pakistan 3.3 Implementation & Evaluation of Digital Health Systems • Frameworks for evaluating digital health interventions (effectiveness, equity, usability). • Human-centred evaluation of telehealth platforms, apps, and AI-enabled tools. • Clinician's role in evaluating usability • Measuring success: adoption, efficiency, patient safety, satisfaction. • Incorporating feedback loops from clinicians and patients into system design. • Evidence-based selection of digital tools Practical Components: • Capstone: Teams evaluate an existing digital tool in Pakistan (e.g., telehealth platform, digital therapeutic, or mobile maternal health app) and present redesign + implementation recommendations. • Teams may choose an *EHR module* (e.g., prescription entry, patient summary page) as the digital tool they evaluate and redesign.

Course 4: Health Data Science
2nd Semester | 2 + 1 Credit Hours

4.1 **Public health informatics**
- Applications of informatics in public health
- Disease surveillance systems
- Population health management
- Data-driven public health interventions in Pakistan

4.2 **Artificial intelligence in health care**
- Fundamentals of AI and machine learning for clinicians
- Clinical applications across specialties
- Evaluation frameworks for AI tools
- Implementation strategies for clinical workflows

4.3 **Digital diagnostics**
- Evaluation of digital diagnostic tools
- Implementation in resource-constrained settings
- Integration with clinical decision-making
- AI-powered diagnostics and considerations

4.4 **Large Language Models in Clinical Practice**
- Capabilities and limitations of GenAI in healthcare
- Prompt engineering for clinical scenarios
- Evaluation of outputs for accuracy and safety
- Integration into clinical documentation

4.5 **AI Implementation in Clinical Workflows**
- Mapping AI integration points in clinical pathways
- Change management for AI adoption
- Measuring impact on clinical outcomes
- Case studies from similar healthcare contexts

4.6 **Responsible AI in Healthcare**
- Explainable AI for clinical decision support
- Bias detection and mitigation strategies
- Governance frameworks for clinical AI
- Regulatory compliance in Pakistani context

4.7 **Precision medicine**
- Integration of genomic data with clinical information
- Personalized treatment planning
- Implementation considerations for Pakistan
- AI applications in precision medicine

Practical Components:
- Hands-on basic Python/R programming sessions
- Practical exercises on data-driven decision-making
- Hands-on data analysis workshops
- AI tool evaluation and implementation planning
- Generative AI prompting exercises for clinical scenarios
- **Capstone Project**: Development of a comprehensive digital health implementation plan incorporating all four DECODE domains with emphasis on appropriate AI and data science applications

Course 5: Professionalism, Ethics, and Digital Security 2nd Semester | 2 Credit Hours
5.1 **Professionalism, ethical, legal, and regulatory considerations in digital health** • Professional standards for digital health practice • Human subjects research and the Belmont report • Institutional Review Boards • Ethical frameworks for digital health: balancing innovation with patient protection • Regulatory challenges in emerging economies: lessons from global south • Data sovereignty and cross-border health data sharing implications • HIPAA principles and their relevance to Pakistani context • Case studies 5.2 **Digital identity, safety, and security in clinical practice** • Maintaining an appropriate professional digital identity • Cybersecurity fundamentals for healthcare professionals • Practical protocols for patient data protection in resource-limited settings • Recognizing and responding to cyber-risks and threats • Balancing accessibility with security: Data security protocols for AI applications in healthcare 5.3 **Data governance and data management** • Healthcare data governance frameworks • Data quality assessment and improvement • Lifecycle management of health data • Preparing clinical data for AI applications

Learning Outcomes

The curriculum addresses all 33 mandatory learning outcomes from the DECODE framework and incorporates relevant discretionary learning outcomes based on the Pakistani healthcare context, with particular emphasis on AI and data science applications.

Knowledge-Based Learning Outcomes:

- Explain ethical, legal, and professional standards for digital health practice
- Describe telehealth modalities and their applications in diverse clinical settings
- Identify essential components of electronic health records and clinical information systems
- Explain the principles of AI and machine learning in healthcare applications
- Describe how digital health tools can address healthcare challenges in Pakistan

Skill-Based Learning Outcomes:

- Conduct effective telehealth consultations following best practice guidelines
- Evaluate and select appropriate digital health tools for specific clinical scenarios
- Navigate and utilize electronic health records efficiently and securely
- Apply computational thinking to solve clinical problems
- Implement appropriate AI tools within clinical workflows

Behavior-Based Learning Outcomes:

- Maintain appropriate professional digital identity across all platforms
- Advocate for digital health literacy and equitable access in patient populations

- Practice secure data management in accordance with governance standards
- Demonstrate responsible use of AI tools in clinical decision-making
- Engage in continuous learning about emerging digital health technologies

Teaching and Assessment Methodologies

- **Interactive Learning**: Expert-led sessions, case-based discussions, and problem-solving activities
- **Practical Application**: Hands-on workshops, simulations, and real-world exercises
- **Collaborative Learning**: Group projects, peer feedback, and community of practice
- **Industry Engagement**: Field visits, guest lectures, and mentorship from digital health leaders
- **Assessment**: Module assignments (40%), participation (20%), capstone project (40%)

Course	**Credit hours**	**Semester**
Overview & Preparing for Digital Health	2	1
Patient and Population Digital Health	2 + 1	1
Health Information Systems	3 + 1	1 and 2
Health Data Science	2 + 1	2
Professionalism, Ethics, and Digital Security	2	2
Capstone Project	2 + 2	1 and 2
	Total = 18	

Please note that LUMS Learning Institute reserves the right to make amendments to the course outline as deemed necessary. Any changes will be communicated to all students in advance, and an updated outline will be provided to ensure a seamless learning experience. We appreciate your understanding and flexibility as we strive to deliver the most relevant and impactful program.