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6. Information Technology in Public Health

Course Objectives:

To introduce the fundamentals of information and communication technologies (ICT) in public health.

To understand the use of digital tools, data systems, and e-health applications for health surveillance, monitoring, and service delivery.

To build competencies in using health information systems, telemedicine, and GIS.

To promote ethical and secure handling of digital health data.

Unit I: Fundamentals of Health Information Technology

Overview of IT and ICT in health care

Types of health data: individual, aggregate, spatial

Electronic Health Records (EHRs) and Electronic Medical Records (EMRs)

Health data standards (HL7, ICD-10, SNOMED)

Cloud computing and mobile health (mHealth)

Unit II: Health Management Information Systems (HMIS)

Components and functions of HMIS

Data collection tools and software (e.g., DHIS2)

Data quality assurance, validation, and verification

Applications in planning, resource allocation, and decision-making

National Digital Health Mission (NDHM) and Ayushman Bharat Digital Mission (ABDM)

Unit III: Geographic Information Systems (GIS) and Telehealth

GIS: concepts, components, and uses in public health

Mapping health facilities, disease trends, and resource allocation

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Basics of QGIS and ArcGIS

Telemedicine: definition, applications, and challenges

E-health and remote care: case studies and implementation models

Unit IV: Data Privacy, Security & Ethics in Public Health IT

Principles of health data confidentiality and integrity

Ethical issues in data sharing and digital surveillance

Legal frameworks: IT Act, HIPAA (overview), and Indian privacy laws

Cybersecurity risks in health information systems

Data governance in public health

Suggested Readings:

WHO. eHealth Tools and Services: Needs of Member States

Shortliffe EH, Cimino JJ. Biomedical Informatics

National Digital Health Blueprint (NDHB), Government of India

K. Park, Textbook of Preventive & Social Medicine (Chapter on Health Information)

Ramesh Bhatia, Health Informatics and IT in Public Health

7. Public Health Ethics and Laws

Course Objectives:

To develop an understanding of ethical principles and frameworks in public health practice and research.

To familiarize students with legal provisions and institutional mechanisms related to public health in India.

To examine real-world public health dilemmas through ethical reasoning.

To understand the role of rights, duties, and justice in public health laws and policies.

Unit I: Foundations of Public Health Ethics

Bohmer

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