Name of the Program: M.Sc. Public Health & Epidemiology

[Syllabus Approved by Board of Studies, Medical & Health Sciences]

Programme Code	:	HLTH21
Programme Details	:	M.SC PUBLIC HEALTH & EPIDEMIOLOGY
Programme Learning Outcomes (PLOs / PSOs)	:	ANNEXED IN THE BELOW FORMAT.
Eligibility Criteria	:	ONLY INDIAN NATIONALS CAN APPLY. GRADUATION FROM UGC RECOGNISED UNIVERSITY WITH AGGREGATE 50% MARKS IN ANY OF THE FOLLOWING SUBJECTS • MEDICAL/ DENTAL/ AYUSH • SOCIAL SCIENCES • SOCIAL WORK • BIOLOGICAL SCIENCES (BIOCHEMISTRY, ZOOLOGY, MICROBIOLOGY BIOTECHNOLOGY, LIFE SCIENCES & GENETICS) PREFERENCE WILL BE GIVEN TO CANDIDATES WITH PREVIOUS TRAINING / WORKING EXPERIENCE IN COMMUNITY WORK.
Duration of the Course	:	2 YEARS
Programme Structure (Credit-Based)	:	NA
Detailed Course Syllabus	:	ANNEXED IN THE BELOW FORMAT.
Teaching–Learning Methodologies	:	DIDACTIC LECTURES FOLLOWED BY HANDS-ON EXPERIENCE.
Examination & Evaluation System	:	ANNUAL EXAMINATION
Internship / Project / Dissertation Guidelines	:	1 YEAR MANDATORY INTERNSHIP, THESIS SUBMISSION PRIOR TO FINAL EXAMINATION
Program In Charge	:	DR. RAJESH DIKSHIT dixr24@hotmail.com

M.Sc. PUBLIC HEALTH and EPIDEMIOLOGY

Programme Code: HLTH21

Programme Outcome:

- Will provide the basics of epidemiology, with emphasis on intervention trails, cohort studies, confounding & bias studies, understanding on various epidemiology related data analysis, and so on.

- To make acquaintance with the basic understanding of biostatistics, related knowledge on data presentation, probability distribution, confidence interval, variance analysis, statistical analysis, sampling theory and so on. Will also provide opportunity to be acquainted with different statistical software.

- Basic concepts of population sciences will be introduced, bringing out the factors that impact health outcomes in different populations, providing knowledge on health care, socio-economic consequences of population growth, health policies, environments, etc.

- The course on "Research Methods" will help in developing research aptitude in students, guiding them how to identify a correct research area, formulate a proper research topic, communicate research finding, write scientific articles, prepare research proposal, and so on.

- Acquaintance with the health financing and its relation to macro and micro economics, resource mobilizations, and financial sustainability in the costing and budgeting health programs are the main goal of the course designed on "Health Economics".

- Course on "Social and Behaviour Sciences" will provide basic understanding on medical anthropology, with the emphasis on the development of methodologies for health promotion and related social awareness & marketing.

- To provide knowledge on various types of cancer registries, their operations, analysis of various registry data, follow up methods, survival studies and related research are the major objective for the course on "Cancer Registries".

- Understanding normal & cancer cells, DNA replication, transcription, translation, repair mechanisms, etc. are the part of the course on "Human Genetics". This course also provide knowledge on cell cycle, apoptosis, carcinogenesis, and related topics.

- The course on "Design and Conducting Field Intervention Trials" have been introduced to provide knowledge on public health in developing countries, Understanding international classification of diseases (ICD), and to get acquainted with the screening of diseases, primary prevention of diseases, and to propagate the community based health promotions.

DETAILED COURSE STRUCTURE

Year	Course Code	Course name	Hours/session	Marks
1st Year	Paper I,	Basic Epidemiology	15	100
	Paper I	Biostatistics	15	-
	Paper II,	Population Sciences	10	100
	Paper II,	Research methods	10	-
	Paper III,	Health Economics	5	50
	Paper III,	Social and Behavior Sciences	5	50
	Practical-II	Practical & Via-Voce-1	20	100
2nd Year	Paper I	Public health and Community Based intervention	25	100
	Practical-II	Practical & Viva-Voce-II	20	100
		Field activities	16	50
		Thesis	NA	150
			141	**800**

ELECTIVE COORDINATOR

	Elective Course(any 02)			
Year		**Course name**	**Hours/session**	**Marks**
2nd Year	Paper II	Cancer Registries-1	15	100
	Paper II	Molecular Epidemiology and Population genomics-1	15	100
	Paper II	Implementation and behaviour Science - 1	15	100
	Paper III	Cancer Registries-2	15	
	Paper III	Molecular Epidemiology and Population genomics -2	15	100
	Paper III	Implementation and behaviour Science - 2	15	100
	Total (Any 02)		**30**	**200**

COURSE COORDINATOR

Course name	Course Coordinator
Basic Epidemiology	Dr. Rajesh Dikshit (dixr24@hotmail.com)
Biostatistics	
Population Sciences	
Research methods	
Health Economics	
Social and Behavior Sciences	
Public health and Community Based intervention	
Thesis	
Field activities	
Practical & Via-Voce-1	
Practical & Viva-Voce-II	

ELECTIVE COURSE COORDINATOR

Course name	Course Coordinator
Cancer Registries-1	Dr. Rajesh Dikshit (dixr24@hotmail.com)
Cancer Registries-2	
Molecular Epidemiology and Population genomics-1	
Molecular Epidemiology and Population genomics -2	
Implementation and behaviour Science - 1	
Implementation and behaviour Science - 2	

CORE COURSES

Basic Epidemiology

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Objectives**
- **Basic Concepts – 1**
- **Basic Concepts – 2**
- **Study Designs**
- **Descriptive studies**
- **Intervention trails**
- **Cohort studies**
- **Case-control studies**
- **Bias & Confounding**
- **Interaction**
- **Exposure assessment**
- **Epidemiological field work in population based studies**
- **Interpretation of Epidemiological studies**
- **Sample size determination**
- **General Principle of data analysis.**

Course Outcomes:

- To be able to understand the basic concepts of epidemiology.
- Introducing the concepts of intervention trails, cohort studies, confounding & bias studies, etc.
- To provide knowledge on various data analysis procedures related to epidemiology studies.
- To develop ability in utilizing acquired knowledge in the epidemiological research.

Basic Biostatistics

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Data Presentation**
- **Numerical Summary measures**
- **Probability**
- **Theoretical probability distribution**
- **Confidence Interval**
- **Hypothesis testing**
- **Comparison of two means**
- **Analysis of Variance**
- **Non Parametric methods**
- **Inference on proportion**
- **Contingency tables**
- **Multiple 2×2 tables**
- **Introduction to statistical software – 1**
- **Introduction to statistical software – 2**
- **Correlation**
- **Simple Linear Regression**
- **Survival analysis – 1**
- **Survival analysis – 2**
- **Sampling theory**

Course Outcomes:

- To provide basic understanding of biostatistics.
- To acquire knowledge on data presentation, concepts of probability, probability distribution, confidence interval, variance analysis, etc.
- Introducing to statistical analysis, sampling theory and so on.
- To get acquainted with different statistical software.

Population Sciences

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Factor affecting the size of population**
- **Measure of fertility and mortality**
- **Population projection**
- **Demography transition**
- **Implication of rapid population growth**
- **Life table**
- **Sampling**

Course Outcomes:

- To provide knowledge on the factors that impact health outcomes in populations.
- Develop awareness in health care, socio-economic consequences of population growth, health policies, environments, etc.
- To create sustainable solutions for good health of the people.

Research Methods

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Literature Search**
- **Choosing Research Topics**
- **Formulating Research Questions**
- **Instrument Development**
- **Communicating Research Finding**
- **Scientific Writing**
- **Development of Research Proposal**

Course Outcomes:

- To inspire taking up research as the profession.
- Inculcate the habit of literature search.
- Develop the quality in identifying correct research area & formulating proper research topic.
- To get essential training in communicating research finding, writing scientific articles, preparing research proposal, and so on.

Health Economics

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Introduction to Macro and Micro economics**
- **Demand and Supply**
- **Health financing**
- **National and District health accounts**
- **User fees**
- **Resource mobilization**
- **Costing and budgeting**
- **Financial sustainability**

Course Outcomes:

- To get acquainted with health financing and related macro and micro economics.
- Acquire knowledge of national and district health accounts and related resource mobilizations.
- Basic understanding of costing, budgeting and financial sustainability.

▪ Social and Behaviour Sciences

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Social dimension of Health and ill Health**
- **Cultural determinants of Health and health seeking behaviour**
- **Medical anthropology**
- **Skills in Health communication**
- **Social marketing**
- **Health Promotion**
- **Qualitative study designs**

Course Outcomes:

- Basic understanding of medical anthropology, i.e. how health and illness are shaped, experienced, and amended in light of global, historical, and political forces.
- To get acquainted with cultural determinants of health and health seeking behavior.
- Develop methodologies for health promotion and related social awareness and marketing.

▪ Public health and Community Based intervention

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Tobacco control**
- **Infection Control**
- **Occupational related chronic diseases prevention**
- **Dietary prevention of Chronic Diseases**
- **Reproductive and Child Health**
- **Drinking water, sanitation and cooking fuel**
- **Screening of chronic diseases**
- **Screening of cancer**

Course Outcomes:

- Basic understanding of medical anthropology, i.e. how health and illness are shaped, experienced, and amended in light of global, historical, and political forces.
- To get acquainted with cultural determinants of health and health seeking behavior.
- Develop methodologies for health promotion and related social awareness and marketing.

ELECTIVE COURSES

▪ Cancer Registries -1

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Types of registries and their operation**
- **Quality Control of Cancer Registry**
- **ICD-Coding**
- **Establishment of Population Based and Hospital Based Registries**
- **Data items required for registries**
- **Cancer Incidence in Five Continent**
- **GLOBOCZN**
- **Use of Cancer Registry data in Cancer Control**

Course Outcomes:

- To provide knowledge on various types of cancer registries and their operations.
- Getting acquainted with the analysis of various registry data, relevant to the follow up methods, survival studies, and so on.

Cancer Registries -2

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Statistical analysis of registry data**
- **Time trends**
- **Survival analysis " Observed, relative , life table methods**

Course Outcomes:

- To provide knowledge on various types of cancer registries and their operations.
- Getting acquainted with the analysis of various registry data, relevant to the follow up methods, survival studies, and so on.

▪ Molecular Epidemiology and Population genomics – 1

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Conceptual framework in Molecular Epidemiology**
- **Ethical issues in molecular epidemiology research**
- **Biological sample collection, processing , storage and information management**
- **Physical/Chemical /immunogenic and analytical methods**
- **Assessment of genetic damage in healthy and disease tissue**
- **Basic principle and laboratory analysis of genetic variation**
- **Platform for biomarker analysis using high throughput approaches in genomics, transcriptomics, proteomics metabolomics and bioinformatics**
- **Environmental and occupational toxicant**
- **Infectious agent**
- **Dietary intake and nutritional status**
- **Assessment of hormonal milieu**

Course Outcomes:

- To get acquainted with Molecular Epidemiology and Population genomics
- Understanding methods in Molecular Epidemiology and Population genomics
- Understanding application of Molecular Epidemiology in Public Health

▪ Molecular Epidemiology and Population genomics – 2

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Integration of biomarkers into epidemiology study design**
- **Population based study design in molecular epidemiology**
- **Measurement errors in biomarkers**
- **Application of biomarker to disease**
- **Analysis of genotyping data**
- **Joint effect, gene gene interaction, gene environment interaction**
- **Sensitivity and specificity of biomarkers**
- **Polygenic risk score**
- **Mendelian Randomizatipon**

Course Outcomes:

- To get acquainted with Molecular Epidemiology and Population genomics
- Understanding methods in Molecular Epidemiology and Population genomics
- Understanding application of Molecular Epidemiology in Public Health

- **Implementation and behavior Sciences -1**

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Risk factors for Chronic diseases**
- **Cancer Prevention – Primary, Secondary, and Tertiary prevention**
- **National health programmes in cancer care- NP-NCD, National Tobacco Control Programme, National Oral Health Programme, National Health Mission**
- **Cancer screening in India – progress, challenges, community applications**
- **Integration of cancer prevention into existing health systems**
- **Follow-up and continuum of care in cancer**
- **Palliative care – Symptomatic management, nutritional support, ethical considerations, end-of-life care**
- **Implementation of palliative care programs – role of home-based care**
- **Patient navigation, adherence interventions, and health-seeking behaviour in cancer**
- **Introduction to Implementation Science – Definition, scope, relevance in cancer control**
- **Difference between Implementation Science, Operations Research, and Health Services Research**
- **Theories, models, and frameworks in Implementation Science**
- **Study designs in Implementation Research – hybrid designs (Type I, II, III), cluster RCTs, stepped wedge, pragmatic trials.**
- **Mixed methods and qualitative approaches in Implementation Science**
    - Use of Implementation outcomes acceptability, adoption, appropriateness, feasibility, fidelity, penetration, cost, sustainability.
    - Barriers and facilitators for implementation in LMICs
- **Health Service Research**
- **Classification of diseases-ICD**
- **Public Health in developing countries**
- **Primary prevention**
- **Screening**
- **Screening for cancer sites; (breast, cervic, oral cavity, colorectum, prostate)**
- **Community based Health Promotion**
- **Challenges and solutions in obtaining mortality data for Public Health Research in developing Countries**
- **Death Certificates: Rules for writing and coding cause of deaths.**

Course Outcomes:

- To provide knowledge on public health in developing countries.
- Understanding international classification of diseases (ICD)
- To get acquainted with screening of diseases, primary prevention of diseases, and to propagate the community based health promotions.
- Understanding the challenges related to the public health, mortality data, certifications of deaths, etc, prevalent to the developing countries, especially.

▪ Implementation and behavior Sciences -2

Coordinators: Dr. Rajesh Dikshit
dixr24@hotmail.com

Course Details:

- **Behavioral Sciences in Oncology**

  - Introduction to behavioral sciences in public health and oncology
  - Theories of health behaviour (HBM, TPB, SCT, Transtheoretical model, COM-B)
  - Qualitative methods in behavioral research – FGDs, IDIs, ethnography
  - Quantitative tools – surveys, scales, KAP studies
  - Individual-level behavior change interventions counselling, Health, motivational interviewing
  - Community-level interventions – awareness campaigns, peer-led approaches, social marketing
  - System-level interventions – policies, taxation, warning labels
  - Stigma, myths, and misconceptions in cancer
  - Evidence-based public health interventions
  - Role of health promotion and population-wide interventions
  - Public health policies for cancer and NCDs
  - Healthcare interventions – standard treatment guidelines and referral system
  - School-based interventions for NCDs
  - Capacity building of workforce focusing on NCDs
  - Progress and challenges in implementation of FCTC
  - Progress and challenges in spreading cancer awareness in community
  - Integration of NCD programmes and addressing comorbidities

- **Economics, Monitoring & Global Initiatives**

  - Measuring cost-effectiveness for NCD interventions
  - Monitoring, evaluation and building information systems for NCDs – disease registry
  - Global, regional, and national initiatives for prevention and control of NCDs

Course Outcomes:

- To provide knowledge on public health in developing countries.
- Understanding international classification of diseases (ICD)
- To get acquainted with screening of diseases, primary prevention of diseases, and to propagate the community based health promotions.

- Understanding the challenges related to the public health, mortality data, certifications of deaths, etc, prevalent to the developing countries, especially.