**Institute of Microbiology and Molecular Genetics**
**Faculty of Life Sciences**
**University of the Punjab, Lahore**
## Course Outline

| Programme | BS | Course Code | MMG307 | Credit Hours | 03 |
|---|---|---|---|---|---|
| **Course Title** | **EPIDEMIOLOGY AND PUBLIC HEALTH** | | | | |

### COURSE INTRODUCTION

The course will introduce fundamental principles and practices of epidemiology, the study of the distribution and determinants of health-related events, diseases, or health-related characteristics among populations. The course will also emphasize on exploring the concepts, methods, and applications of epidemiology in preventing disease, promoting health, and protecting populations.

### LEARNING OUTCOMES

On the completion of the course, the students will be able to:
1. Explain the principles of epidemiology about diseases.
2. Analyze patterns of disease transmission and strategies for prevention and control.
3. Apply epidemiological methods to public health challenges involving microorganisms.

### COURSE CONTENT

Introduction to epidemiology and public health: Definitions, key features, and applications of descriptive and analytic epidemiology, endemic, epidemic, pandemic, Measures of risk: calculation and interpretation of Frequency Measures: ratios, proportions, rates, Morbidity Frequency Measures: Incidence, prevalence, Mortality Frequency Measures: Crude death rate, cause-specific, proportionate mortality, Death-to-case ratio, Infant and maternal mortality rates, Natality (Birth) Measures: crude birth rate, fertility rate, low birthrate, Measures of Association: risk ratio, odd ratio, Measures of Public Health Impact: Exposure and outcomes, attributable proportion and vaccine efficacy or effectiveness, Overview of Epidemiological Study Designs Experimental, observational, case-control, case studies, cohort, ecological, Organizing Epidemiologic Data: Preparation and application of tables, graphs, and charts.: Public Health Surveillance Process, uses, and evaluation of public health surveillance Investigating an Outbreak:, Steps of an outbreak investigation. Epi Info™ software for outbreak investigations

### TEXTBOOKS AND READING MATERIAL

1. Aschengrau, A., & Seage, G. R. (2013). *Essentials of epidemiology in Public Health*. Jones & Bartlett Publishers.Boston, MA.
2. Elmore, J. G., Wild, D., Nelson, H. D., & Katz, D. L. (2020). *Jekel's Epidemiology, Biostatistics and Preventive Medicine*. Elsevier Health Sciences.
3. Bonita, R. Beaglehole, R., Kjellström, T., (2006). *Basic Epidemiology*. 2nd edition. WHO Press.
4. Schneider, M. J. (2020). *Introduction to Public Health*. Jones & Bartlett Learning. Boston, MA
5. Bovbjerg, M. L. (2020). *Foundations of Epidemiology*. Oregon State University E-campus.
6. Celentano, D. D., Szklo, M., & Farag, Y. (2023). *Gordis Epidemiology* .Elsevier Health Sciences.

7. Merrill, R. M. (2024). *Introduction to epidemiology*. Jones & Bartlett Learning. Boston, MA.
8. Goldsteen, R. L., Goldsteen, K., & Dwelle, T. (2024). *Introduction to Public Health: Promises and Practices.* Springer Publishing Company.
9. Friis, R. H., & Sellers, T. (2020). *Epidemiology for Public Health Practice*. Jones & Bartlett Learning.
10. Centers for Disease Control and Prevention (CDC) website
11. World Health Organization  Website

| ASSESSMENT | | | |
|---|---|---|---|
| **Sr. No.** | **Elements** | **Weightage** | **Details** |
| 1. | Midterm Assessment | 35% | Written Assessment at the mid-point of the semester. |
| 2. | Formative Assessment | 25% | Continuous assessment includes Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on activities, short tests, projects, practicals, reflections, readings, quizzes etc. |
| 3. | Final Assessment | 40% | Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, fieldwork , report writing etc. |