| Course Title: | **Epidemiology** |
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| Course Code: | **BSTA-202** |
| Semester: | **III** |
| Credit Hours: | **03** |

**Learning Outcomes**

By the end of this course, students will be able to:
1. introduce the basic principles and methods of epidemiology and demonstrate their broad applicability to public health.
2. distinguish between descriptive and inferential statistics resulting from data analysis.
3. provide fundamental skills needed to interpret and critically evaluate literature relevant to public health professionals.
4. provide a structured method for organizing and analyzing raw data and to enable you to interpret and communicate the results to public health professionals and to the general public.

**Course Outline**

**Unit – I**

Epidemiology, Disease Measures and Applications: Incidence and Prevalence, Risk and Relative Risk, Odds and Odds Ratio with Confidence Intervals, Attributable risk, Rate and Relative Rate. Sensitivity and Specificity. OC Curve.

**Unit-II**
**Confounding and Interaction**
Concept of Confounding, Identification of Confounders, Assesment of Confounding: using estimation, hypothesis testing, dealing with several confounding variables. Mantel-Haenszel Relative Risk and Test. Concept of Interaction, Tests for Interaction: Relative risk, Odds Ratio, Risk difference.

**3.1 Sampling Strategies**
Sampling Strategies and Descriptive Studies (Ecological, Cross Sectional, and Qualitative).

**3.1.1   Popular Epidemiological Study Types**
Case Control and Nested Case Control Studies, Cohort Studies, Intervention Studies, Screening.

**3.1.2   Specific Types of Epidemiological Studies**
Environmental Epidemiology, Genetic and Molecular Epidemiology.

- **Teaching-learning Strategies:**
Class Lecture method, which includes seminars, discussions, assignments and projects. (Audio-visual tools are used where necessary)
- **Assignments-Types and Number with calendar:**
According to the choice of respective teacher.

- **Assessment and Examinations:**

According to the University's Semester Rules.

| Sr. No. | Elements | Weightage | Details |
|---------|----------|-----------|---------|
| 1. | Midterm Assessment | 35% | It takes place at the mid-point of the semester. |
| 2. | Formative Assessment | 25% | It is continuous assessment. It includes: Classroom participation, attendance, assignments, and presentations, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc. |
| 3. | Final Assessment | 40% | It takes place 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, field work and report writing etc. |

**Textbooks:**

1. Antonisamy, B., Premkumar, P. S., & Christopher, S. (2017). *Principles and Practice of Biostatistics-E-book*. Elsevier Health Sciences.
2. Bojdani, E. (2017). *Essential Epidemiology: An Introduction for Students and Health Professionals* (3rd ed.). Cambridge, UK: Cambridge University Press.

**Suggested Readings:**

1. Brauer, F., Castillo-Chavez, C., & Feng, Z. (2019). *Mathematical models in epidemiology* (Vol. 32). New York: Springer.
2. Carneiro, I. (2018). *EBOOK: Introduction to Epidemiology*. McGraw-Hill Education (UK).
3. Carstensen, B. (2021). *Epidemiology with R*. Oxford University Press, USA.
4. Chen, X. (2020). *Statistical Methods for Global Health and Epidemiology: Principles, Methods and Applications*. Springer Nature.
5. Foti, C., Bonamonte, D., Bosco, A., & Angelini, G. (2021). *Introduction and Epidemiology: In Clinical Contact Dermatitis.* (pp. 1-9). Springer, Cham.
6. Liu, J., & Xia, S. (2020). *Computational epidemiology: From disease transmission modeling to vaccination decision making*. Springer Nature.
7. Merrill, R. M. (2019). *Introduction to epidemiology*. Jones & Bartlett Learning.