Course Title	Principles of Epidemiology and Public Health				
Course Code	MPH-511				
Course Type	Required				
Level	2nd Cycle				
Year / Semester	1 / 1				
Teacher's Name	Dr Elena Critselis Dr Christiana Demetriou Dr Neophytos Stylianou				
ECTS	10	Lectures	26	Interactive learning activities	26
Course Purpose and Objectives	The main objectives of the course are to: • Demonstrate deep understanding and apply measures of descriptive and analytic epidemiology used to assess the frequency, distribution and determinants of disease in human populations. • Demonstrate deep understanding and apply the different study designs in epidemiological research and be able to design their own epidemiological studies for answering research questions relevant to Public Health. • Demonstrate deep understanding and critically evaluate concepts pertaining to internal study validity (random error, bias, confounding) and external study validity (generalizability) • Demonstrate deep understanding and explain the importance of systematic reviews and meta-analyses in Public Health and be able to interpret these for answering research questions relevant to Public Health. • Demonstrate deep understanding and differentiate between association and causation, as well as critically evaluate the importance of their distinction in Public Health Policy • Demonstrate deep understanding and apply the different levels of prevention and be able to design their own preventive measures for tackling current Public Health challenges. • Demonstrate deep understanding of the aims, objectives, and responsibilities of the World Health Organization and its leadership priorities, as well as the health-related UN Sustainable Development Goals				
Learning Outcomes	After completion of the course students are expected to be able to: 1. Define Epidemiology and Public Health and describe their importance for ensuring disease prevention, wellbeing, and prosperity in populations. 2. Demonstrate deep understanding on the major measures of disease frequency (e.g. prevalence, incidence, rate, and attack rate) and be able to calculate, interpret, and apply them in a relevant scenario. 3. Demonstrate deep understanding on the major measures of mortality (e.g. crude, cause-specific, age-specific, perinatal, case-fatality rate, and standardized mortality ratio) and be able to calculate, interpret, and apply them in a relevant scenario.				

4. Demonstrate deep understanding and apply the major concepts involved in analytic epidemiology, such as exposure/predictor, outcome/response, association, determinant, risk factor, and protective factor.
5. Demonstrate deep understanding on the major measures of association used in Epidemiology and Public Health research pertaining to the analysis of binary outcomes (Odds Ratio, Relative Risk) and be able to calculate, interpret, and apply them in a relevant scenario.
6. Demonstrate deep understanding on the major measures of association used in Epidemiology and Public Health research pertaining to the analysis of numeric outcomes (e.g. Regression coefficient and mean difference) and be able to calculate, interpret, and apply them in a relevant scenario.
7. Demonstrate deep understanding on the major measures of impact used in Epidemiology and Public Health research (i.e. Attributable Risk, Population Attributable Risk, and Population Attributable Risk Fraction) and be able to calculate, interpret, and apply them in a relevant scenario.
8. Demonstrate deep understanding of the major Observational Epidemiological study designs (e.g. ecological, cross-sectional, case-control, and cohort study designs) and be able to design a suitable study for answering specific research questions of Public Health importance.
9. Demonstrate deep understanding of the major Interventional Epidemiological study designs (i.e. Randomized Controlled Trials and other non-randomized trials) and be able to design a suitable study for answering specific research questions of Public Health importance.
10. Demonstrate deep understanding and critically evaluate concepts relating to sampling, estimation, and statistical inference, such as parameters vs. estimates, and statistical significance.
11. Demonstrate deep understanding and describe in detail the different sampling methods used in Epidemiology, as well as be able to critically appraise sampling approaches from published studies, as well as design their own sampling strategy for a given research scenario.
12. Demonstrate deep understanding and describe in detail the different types of selection bias and critically appraise how they could affect the validity of each different study design, as well as describe ways on how to avoid these, and be able to detect and determine them in published research studies.
13. Demonstrate deep understanding and describe in detail the different types of information bias and critically appraise how they could affect the validity of each different study design, as well as describe ways on how to avoid these, and be able to detect and determine them in published research studies.
14. Demonstrate deep understanding and describe in detail the concepts of sensitivity, specificity, positive and negative predictive values and be able

	to calculate, interpret and critically appraise such results from the published literature.
	15. Demonstrate deep understanding and describe in detail the multi-factorial nature of disease and the concept of confounding and critically appraise how it could affect the validity of research findings
	16. Describe ways on how to deal with confounding, and be able to detect and determine it in published research studies (including the interpretation of crude and adjusted estimates).
	17. Demonstrate deep understanding and describe in detail the concepts of effect modification (interaction) and effect mediation, and critically evaluate and differentiate them from confounding, as well as be able interpret and critically appraise such results from the published literature.
	18. Demonstrate deep understanding and describe in detail the concept of external study validity (generalizability) and be able to compare, contrast and differentiate it from internal study validity, critically evaluating and explaining its importance in Public Health Policy.
	19. Demonstrate deep understanding of the concepts of systematic review and meta-analysis, and be able to perform and evaluate systematic reviews, as well as interpret the results from meta-analyses (forest plots) for answering specific research questions relevant to Public Health.
	20. Distinguish and describe the differences between association and causation and be able to critically evaluate and apply criteria for inferring causality for a given association, and analyse its importance in Public Health Policy.
	21. Demonstrate deep understanding and describe the wider determinants of health: poverty, food/water availability, climate change, armed conflict.
	22. Demonstrate deep understanding and describe in detail the different levels of disease prevention (primary, secondary, tertiary) and critically evaluate and apply them appropriately, as well as be able to design their own preventive measures for tackling current Public Health challenges.
	23. Describe the different routine notification and registration systems for vital statistics and specific diseases and the importance of disease registers.
	24. Demonstrate deep understanding and analyse the structure, organization, responsibilities and priorities of the World Health Organization (WHO), including its leadership priorities and the public health-related UN Millennium Development Goals and Sustainable Development Goals.
Prerequisites	None — Required — None
Course Content	1. Introduction to Epidemiology and Public Health 2. Measures of disease frequency and mortality in chronic and infectious disease epidemiology 3. Measures of Association 4. Measures of Impact 5. Observational study designs: Cross-sectional, Prospective,

	Retrospective 6. Interventional study designs: Randomized Controlled Trials and other non-randomized trials 7. Sampling, random error and statistical inference 8. Systematic error in research I: selection bias 9. Systematic error in research II: Information bias (measurement error) 10. Multi-factorial nature of disease: confounding, effect modification, and effect mediation 11. External study validity and the importance of systematic reviews and meta-analyses 12. Association vs. Causation 13. The Wider Determinants of Health 14. Principles of disease prevention 15. Global Health Monitoring and Public Health Surveillance
Teaching Methodology	This programme is delivered via distance learning (online) and includes recorded lectures, interactive online tutorials (Webinars) and discussion forums, as well as online exercises and other activities.
Bibliography	**Required Textbooks / Reading:**

Title	Author(s)	Publisher	Year	ISBN
Epidemiology in Medicine	Hennekens CH, Buring JE.	Little, Brown & Co	1987	0316356360
Oxford Handbook of Public Health Practice (3rd ed.)	Guest C, Ricciardi W, Kawachi I, Lang I.	Oxford University Press	2013	978-0199586301

Recommended Textbooks / Reading:

Title	Author(s)	Publisher	Year	ISBN
Mastering Public Health: A Postgraduate Guide to Examinations and Revalidation, (2nd ed.)	Lewis G, Sheringham J, Bernal JL), Crayford T	CRC Press	2014	9780199976737
A Dictionary of Epidemiology. (6th ed.)	Porta M, Last JM.	Oxford University Press	2014	978-0199976737

	Issues in Public Health 2nd ed.)	Sim F, McKee M.	Open University Press	2011	978-0335244225	
	Public Health at the Crossroads	Beaglehole R, Bonita R.	Cambridge University Press	2004	978-0521540476	
Assessment	Online quiz (formative) Coursework (1 oral presentation, 1 assignment) – 30% Mandatory interactive activities and webinar session attendance/participation – 10% Final exam – 60%					
Language	English					