Course Title	Research Methodology in Public Health				
Course Code	MPH-590				
Course Type	Elective				
Level	2nd Cycle				
Year / Semester	2 / 3				
Teacher's Name	Course Lead: Dr Elena Critselis Course Contributor: Dr Lina Tolma				
ECTS	10	Lectures	15	Interactive learning activities	19
Course Purpose and Objectives	The main objectives of the course are to: • Assess the needs for conducting a research study in the context of public health and generate relevant and testable research questions. • Systematically search for evidence in the literature using the appropriate search engines and databases (e.g. PubMed Health, Cochrane Library, etc) and critically evaluate the existing literature, identifying gaps in knowledge on topics relevant to public health. • Interpret research findings (measures of disease frequency, associations, and diagnostic tool performance) of published literature and critically appraise how different types of systematic bias could affect their validity, articulating strategies to avoid these in different study designs. • Design quantitative (epidemiological) research studies, including selection of the most appropriate: i) study design (observational or interventional) for a given research question, ii) study population, iii) sampling method, iv) accurate variable assessment method(s), v) statistical approach for hypothesis testing, and generating and presenting results appropriately, as well as deriving relevant conclusions. • Design qualitative research studies, involving participant observations, individual interviews, and focus groups for answering a research question in the context of public health. Compose a comprehensive research proposal for a grant application for funding by national or international funding bodies. • Compose a comprehensive research proposal for a grant application for funding by national or international funding bodies.				
Learning Outcomes	After completion of the course students are expected to be able to: 1. Identify issues compromising public health and assess the needs for conducting a research study to address these. 2. Identify gaps in knowledge on research topics relevant to public health and generate relevant and testable research questions in the context of public health using the PICO/PECO format. 3. Systematically search for evidence using appropriate search engines and databases (e.g. PubMed Health, Cochrane Library, etc) and				

	critically evaluate the existing literature, identifying gaps in knowledge on topics relevant to public health. 4. Choose the most appropriate study design for answering specific research questions relevant to public health. 5. Design quantitative observational research studies to answer a research question in the context of public health 6. Design quantitative interventional research studies for answering a research question in the context of public health. 7. Choose the most appropriate population sampling method for a given research scenario relevant to public health. 8. Estimate sample size requirements by performing study power analysis. 9. Select accurate variable assessment methods for a given research scenario relevant to public health. 10. Calculate, interpret and critically appraise sensitivity, specificity, PPV and NPV of screening and diagnostic tools 11. Critically appraise how different types of selection and information bias could affect the validity of different study designs and articulate strategies to avoid these. 12. Interpret research findings (measures of disease frequency, associations, and diagnostic tool performance) of published literature and of systematic reviews/meta-analysis (forest plot). 13. Choose the appropriate statistical analysis for a given research scenario requiring calculation and interpretation of measures of association with binary and numeric outcomes (i.e. odds ratio, relative risk, regression coefficient and mean difference). 14. Critically appraise how the multifactorial nature of disease, as well as the concepts of confounding and effect mediation, could affect the validity of research findings. 15. Distinguish between association and causation and critically appraise criteria for inferring causality for a given association. 16. Compare, contrast and differentiate the concept of external study validity (generalizability) from internal study validity. 17. Design a protocol for evidence synthesis similar to PROSPERO or Cochrane protocol for systematic reviews to answer a research question in the context of public health. 18. Critically evaluate systematic reviews and interpret the results from meta-analyses (i.e. forest plots) for answering specific research questions relevant to public health. 19. Critically appraise the major methodologies used in qualitative research involving participant observations, individual interviews and/or focus groups, and design a suitable qualitative study for answering specific research questions in the context of public health. 20. Compose a complete research proposal for a grant application for funding by national or international funding bodies.

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<tr><td></td><td colspan="3">21. Present expected study findings based on the proposed research hypothesis and question and implications relevant to public health.
22. Derive conclusions based on study findings.
23. Write-up a scientific article presenting original study findings relevant to public health.
24. Perform an oral presentation on original study findings relevant to public health.
25. Communicate study results and conclusions to the media and lay audiences.</td></tr>
<tr><td>Prerequisites</td><td>MPH-511, MPH-512.</td><td>Required</td><td>* For students on the Research Pathway, MPH-590 is required for MPH-596</td></tr>
<tr><td>Course Content</td><td colspan="3">1. Assessing needs for conducting a research study relevant to public health
2. Generating research questions and systematically searching and critically evaluating the existing literature
3. Designing the appropriate quantitative study for answering a research question I: observational research
4. Designing the appropriate quantitative study for answering a research question II: interventional research
5. Estimating sample size requirements (power analysis)
6. Quantitative study conduct I: Choosing the most appropriate sampling method
7. Quantitative study conduct II: Performing accurate variable assessment
8. Quantitative Study conduct III: Choosing the right statistical technique and performing analysis
9. Quantitative study conduct IV: Results presentation and deriving conclusions in quantitative research
10. Writing up a research proposal and applying for funding
11. Design and analysis in qualitative research
12. Communication of results and conclusions I: article write-up
13. Communication of results and conclusions II: oral presentation
14. Communication of results and conclusions III: media and lay audiences</td></tr>
<tr><td>Teaching Methodology</td><td colspan="3">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.</td></tr>
<tr><td>Bibliography</td><td colspan="3">Required Textbooks / Reading:
<table>
<tr><th>Title</th><th>Author(s)</th><th>Publisher</th><th>Year</th><th>ISBN</th></tr>
<tr><td>Concepts of Epidemiology: Integrating the ideas, theories, principles, and</td><td>Bhopal, RS</td><td>Oxford University Press (Oxford Medicine Online)</td><td>3rd</td><td>2016</td></tr>
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methods of epidemiology				

Recommended Textbooks / Reading:

Title	Author(s)	Publisher	Year	ISBN
Epidemiology in Medicine 1st Edition	Hennekens (Author), Julie E. by Charles H. Buring (Author),	Sherry L. Mayrent (Editor)	1987	978-0316356367
Mastering Public Health: A Postgraduate Guide to Examinations and Revalidation, (2nd ed.)	Lewis G, Sheringham J, Bernal JL, Crayford T	CRC Press	2014	978-1444152692
Research methods in community medicine: surveys, epidemiological research, programme evaluation, clinical trials	Abramson, J. H.	Wiley	2008	978-0470986615
Research Methods in Health: Investigating Health and Health Services	Ann Bowling	Open University Press	2009	978-0335233649
Doing a Systematic Review: A Student's Guide (1st ed.)	Boland A, M, Cherry G, Dickson R.	SAGE Publications Ltd	2013	978-1446269688

	Cochrane Handbook for Systematic Reviews of Interventions (Ver. 5.1.0)	Higgins JPT, Green S.	The Cochrane Collaboration	2011	978-047069 9515
	Introduction to Meta-Analysis (1st ed.)	Borenstein M, Larry V. Hedges LV, Higgins JPT, Rothstein HR	Wiley	2009	978-047005 7247
	Qualitative Methods in Public Health: A Field Guide for Applied Research (2nd ed.)	Tolley EE, Ulin PR, Mack N, Robinson ET, Elizabeth T. Robinson, Succop SM	Jossey-Bass	2016	978-111883 4503
Assessment	• Research proposal PICO/PECO (10%) • Research proposal abstract (10%) • Research proposal for grant application (80%)				
Language	English				