Degree Objectives
The distinctive objective of the UC Irvine MPH program is to create a motivated cadre of public health professionals who are prepared to implement effective strategies for reducing the burden of disease and disability in culturally diverse communities, and who are primed to draw from their broad training in public health principles to lead and work collaboratively on precise assessments of health risk factors and on the management of evidence-based prevention strategies. Hence, the core competencies for our MPH program cover the main theoretical and methodological subjects and crosscutting interdisciplinary themes that underpin advanced study and professional practice in public health. In developing our core competencies, we considered the recommendations of the Association of Schools of Public Health core competency development project1,2.

Core Competencies
After completing the core courses common to all UC Irvine MPH students, the students will be able to:

I. Analyze the interrelationships between health risk factors and the susceptibility and vulnerability of populations, using the ecological model and case studies of disease prevention.

II. Apply descriptive and experimental epidemiologic methods to reveal causal associations between risk factors and disease in populations, and to the development of strategies for measuring and curtailing the dissemination of diseases in a population.

III. Analyze the health of populations by applying biostatistics methods to describe vital health status, for estimation, projections and hypothesis testing.

IV. Analyze the health status of populations on the basis of access health services, cost of


care, community structure and governmental policies for the purpose of developing management and policy instruments to prevent disease and improve conditions that support healthy populations.

V. Apply behavioral and social science theory to analyze contemporary public health problems with the aim of lessening the disease burden on society and promoting health.

VI. Analyze how population exposures to environmental risk factors interfere with human biological systems to produce disease and disability in communities, and apply the analysis to develop strategies for disease prevention and health improvement.

VII. Review, critique, and evaluate public health reports and research articles.

VIII. Apply theory, paradigms, principles, and methodologies obtained through formal course work to inform public health practice across community, government, private industry or other institutional settings relevant to public health.

The matrix presented in Table 1 identifies the learning experiences through which the core public health competencies are met.

Table 1. Matrix of core competencies and learning experiences

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<thead>
<tr>
<th>LEARNING EXPERIENCES*</th>
<th>PH-200</th>
<th>PH-206</th>
<th>PH-207</th>
<th>PH-222</th>
<th>PH-244</th>
<th>PH-264</th>
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*See course descriptions for the learning experience below:

PH-200 Foundations of Public Health (4). Presents the overarching framework, principles, and core responsibilities of public health research and practice from a multidisciplinary perspective. Provides necessary foundation for further studies toward advanced cross cutting approaches essential for public health practice. Prerequisite: graduate standing or consent of instructor.

*PH-206 Graduate Epidemiology in Public Health (4). Presents descriptive and experimental approaches to the recognition of the causal association of disease in the general populations, as these approaches apply to populations using different study designs and models from the literature. Prerequisite: graduate standing or consent of instructor.

*PH-207 Public Health Statistics (4). Surveys statistical methods for public health. Topics include descriptive statistics, probability models, likelihood functions, estimation, and hypothesis testing for categorical and continuous data. Students will learn to use statistical software to perform epidemiologic data analysis.
### PH-222 Health Policy and Management (4).
Multidisciplinary inquiry into theory and practice concerned with delivery, quality, cost of health care for individuals and populations. Explores managerial and policy concerns regarding structure, process, outcomes of health services including the cost, financing, organization, outcomes, and accessibility of care.

### PH-244 Health Behavior Theory (4).
Introduces Health Behavior/Education and segues into major theoretical perspectives. Focuses on health behavior change from the perspectives of individual, interpersonal, community, and ecological theories. Relates theories of behavior change at these levels to the construction of health promotion intervention programs.

### PH-264 Introduction to Environmental Health Science (4).
Convergence of agents (chemical, physical, biological, or psychosocial) in the environment can emerge as diseases influenced by social, political, and economic factors, allowing them to become rooted in society. How these agents from various spheres come together and impact human health. Prerequisite: graduate standing or consent of instructor.

### PH-291A-B-C Graduate Seminar: Advances and Challenges in Public Health (2-2-2).
Forum for exploring recent advances and challenges in all disciplines of public health research and practice. Features case studies exemplifying the integration of core competencies with crosscutting interdisciplinary themes of public health. Prerequisite: graduate standing or consent of instructor. Satisfactory/Unsatisfactory only.

### PH-295 Graduate Practicum and Culminating Experience in Public Health (8).
Provides opportunities for hands-on experience for graduate students at agencies or organizations engaged in public health practice. Students are matched with placement sites based on academic preparation and students’ career goals. The practicum report integrates into a synthesis culminating experience. Prerequisites: Public Health 290 and 291. Satisfactory/Unsatisfactory only.

### Electronic Portfolio (E-folio)
Each MPH student is assigned an individual electronic portfolio upon matriculating into the program. They are expected to use this for documenting learning experiences, reflecting on what they have learned, integrating their acquired knowledge, and showcasing their work as they progress through their studies. Faculty reviews the folios quarterly, and the final product is submitted to faculty supervisor for approval as part of the culminating experience before graduation.

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*The competencies within each of these courses are derived from the recommendations in the ASPH MPH Core Competency Model (version 2.3)*

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MPH Emphases
In addition to the core courses required for all MPH students, students have the opportunity to enroll in at least three and up to an additional six courses to deepen their knowledge in their selected area of emphasis. In addition, part-II of the required comprehensive examination, proposal writing for the practicum course (PH-295), selection of practicum agency, and final practicum report are all expected to reflect and contribute to the learning objectives in the emphasis areas.

MPH Emphasis in Environmental Health
The objective of the emphasis in environmental health is to train public health professionals with skills needed to protect the quality of human environments with the goal of reducing the burden of disease and disability associated with environmental risk factors. Students enrolled in the program are expected to have academic backgrounds in the life sciences (e.g. ecology), physical sciences (e.g. chemistry), or social sciences (e.g. public policy and environmental law), although these are not exclusive as other forms of experience in environmental issues may serve to prepare incoming students. Remedial courses may be recommended for those with particular deficiencies in the natural sciences.

Graduates of the MPH degree with an emphasis in environmental health are expected to gain employment in government environmental agencies, public health offices, non-profit organizations, or proceed to doctoral training environmental health degree programs. In developing competencies for the MPH emphasis in environmental health, we considered the recommendations of the combined efforts of the National Center for Environmental Health, the Centers for Disease Control and Prevention, and the American Public Health Association for core competencies for local environmental health practitioners. Those competencies fall into three major categories of assessment, management, and communication. In addition to the core competencies for the MPH degree, graduates who complete the UC Irvine MPH emphasis in environmental health will be able to:

I. Assess environmental risk factors impacting vulnerable communities through critical evaluation of peer-reviewed scientific information, data analysis and their interpretation to support strategies for preventing environmental diseases.

II. Design environmental disease prevention, intervention, or health promotion strategies for communities, considering the complex relationships among environmental agents, exposure processes, biological susceptibilities, human behavior and regulatory policies.

III. Apply the general principles, methods, and practices of environmental modeling to assess community environmental hazards, issues involved in environmental exposure estimation, and human health risk assessment.

IV. Recognize and describe issues related to environmental quality and risks that predispose populations to health impacts in case studies of past or present epidemics, and

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demonstrate knowledge of skills for evaluating domestic and occupational environments to protect public health.

V. Develop and execute proposals grounded in theories and best practices of environmental health science and policy for addressing problems in public health, including formulation of hypotheses about specific health determinants in a vulnerable community, through liaison with a public health agency.

VI. Communicate environmental information in the context of public health, including interpretation of quantitative and qualitative data on risks, vulnerabilities, and current policies, effectively to public and professional audiences through speaking, writing and other forms of documentation.

Selective Courses for MPH Emphasis in Environmental Health

240 Topics in Environmental Health Promotion and Education (4). Focuses on design of intervention strategies dependent on the environmental agent, exposure to assessment, SES, health effects, stakeholders, and support base. Programmatic design includes media selection, communication/education, and pre/post surveys. Analysis of transborder and local environmental health promotion programs. Prerequisite: graduate standing or consent of instructor.

265 Advanced Environmental Health Science (4). Explores the complex relationships among exposure processes and adverse health effects of environmental toxins focusing on specific chemicals, sources, transport media, exposure pathways, and human behaviors. Techniques of environmental sampling for exposure assessment are discussed.

270 Human Exposure to Environmental Contaminants (4). Introduces founders of conceptual thought that environmental contaminants can impact health. Theory and principles of exposure assessment, the continuum from emissions of a contaminant into the environment to evidence of health effects in a population.

275 Environmental Modeling and Risk Assessment (4). Surveys the general principles, basic mathematical methods, and practices of environmental modeling and human health risk assessment. Topics include advection-dispersion models, risk management, and risk perception. Students conduct an original risk assessment as a final group project. Prerequisites: Mathematics 2A; Statistics 7 or equivalent introductory statistics course.

283 Advanced Geographic Information Systems (4). Contextual GIS software learning for visualizing and analyzing health-related data. Lectures and computer lab focuses on a health care issue which uses ArcView GIS from ESRI, Inc. to analyze data or solve problems. Includes
weekly assignments and project case studies. Prerequisites: Graduate standing or introductory GIS course.

*TOX 201 Principles of Toxicology (4) S. Problem solving to demonstrate principles of toxicology; quantitative dose-response relationship; toxicant-target (receptor) interaction emphasizing interspecies differences in Ah receptor and dioxins; complete in vivo metabolism of xenobiotics by mammalian systems; integration of organ responses to toxic agents.

*TOX 202 Environmental Toxicology (4) F. Analysis of real problems involving toxic chemicals and the human food, air, and water supplies, occupational exposures, and life styles. Formal problems will be considered by small groups of students and discussed by the class. Prerequisite: Environmental Toxicology 201.
**MPH Emphasis in Epidemiology**

The objective of the emphasis in epidemiology is to train public health professionals\(^5\) with the skills to assess the distribution of disease and disability in human populations, and the application of this study to the understanding of determinants underpinning morbidity and mortality and strategies for controlling disease in a population. Students are admitted to the MPH emphasis from a variety of backgrounds, but strong quantitative skills are essential. After earning the MPH degree with an emphasis in epidemiology, graduates will be able to explain the role of epidemiology within the broader context of public health, in addition to being able to:

I. Evaluate the scientific merit, strengths, weaknesses, and feasibility of alternative epidemiologic study designs, simulation methods, and real or potential sources of bias that may affect the interpretation of epidemiological investigations.

II. Know how to collect data from existing sources, including published literature, disease registries, vital statistics and public health agency records, for the purposes of analysis and reporting in support of surveillance and epidemiologic investigations.

III. Apply epidemiologic methods to assess the geographical distribution of prevalent chronic and infectious diseases including risk factors, identification of susceptible groups, surveillance, outbreak investigation, and estimation of societal burdens.

IV. Recognize and describe various categories of epidemics, the tactical responses to these categories in case studies of past or present epidemics, and demonstrate knowledge of analytical skills necessary for working collaboratively to protect public health.

V. Develop and execute proposals grounded in epidemiologic theories and approaches for addressing problems in public health, including formulation of hypotheses about specific health determinants in a vulnerable community, through liaison with a public health agency.

VI. Communicate epidemiologic information, including interpretation of quantitative data on risk distribution and policy implications of epidemiologic evidence, to public and professional audiences through oral presentations, writing, and other forms of documentation.

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Selective Courses for MPH Emphasis in Epidemiology

205 Advanced Epidemiologic Methods (4). Advanced topics in the design and statistical analysis of epidemiologic studies. Topics include simulation methods, counter-matching and multiphase study designs, missing data, and Bayesian analysis. Published simulation studies are discussed and replicated using the R software package. Prerequisite: Public Health 101B or Statistics 111 or Statistics 211 or consent of instructor.

202 Genetic Epidemiology (4). Concentrates on the role of genetic factors in the etiology of disease in human populations with an objective of disease control and prevention, and the role of interactions of genetic factors and environmental exposures in the occurrence of disease. Prerequisites: Public Health 203 or 206; graduate standing or consent of instructor.

201 Cancer Epidemiology (4). Concentrates on understanding how epidemiology plays a role in the search for cancer etiology, prevention, control, and treatment; gives an overview of cancer research with an appreciation of the multidisciplinary nature of the field. Prerequisites: Public Health 203 or 206; graduate standing or consent of instructor.

281 Infectious Disease Epidemiology (4). Covers geographical distribution of infectious diseases and the health and disease risk in diverse human populations. Introduces basic methods for infectious disease epidemiology and case studies of important diseases. Includes surveillance, outbreak investigation, emerging pathogens, traditional and molecular epidemiology. Prerequisite: graduate standing or consent of instructor.

EPI 205 Environmental Epidemiology (4). Concentrates on epidemiological approaches to the assessment of community environmental hazards; issues involved in environmental exposure estimation; interdisciplinary approaches to environmental epidemiology, including the use of biomarkers of exposures and susceptibility; epidemiological studies within the context of risk assessment.

EPI 232 Chronic Disease Epidemiology and Prevention (4). Epidemiological aspects of chronic human diseases. Topics include methodologies for quantifying aspects of prevalent chronic diseases including risk factors, identification of susceptible groups, societal burdens, promising future research; and the intervention, prevention, and control of diseases in populations.
**MPH Emphasis in Sociocultural Diversity and Health**

The objective of the MPH emphasis in sociocultural diversity and health is to train public health professionals to critically analyze social, behavioral, and cultural determinants and correlates influencing the trajectory of maladaptive behavior, disease, and ultimately health disparities existing in populations and communities. The aims of developing expertise in this public health emphasis are to: 1) know how to conduct a critical and theory informed analysis of public health problems; 2) create research proposals to investigate the correlates and determinants of public health problems; 3) use the information gleaned from this critical analysis (from (1) and (2) above) of public health problems to construct health behavior change intervention programs, tailored appropriately for ethnically, culturally and socioeconomically diverse populations; and 4) create research proposals to evaluate health behavior change programs. The MPH emphasis in sociocultural diversity and health attracts applicants from a variety of backgrounds with strong verbal, abstract reasoning, and analytical skills and with both a commitment to and passion for addressing health disparities by cultivating knowledge of particular attributes that contribute to vulnerabilities to disease and disability in communities.

In developing competencies for the emphasis in sociocultural diversity and health, we considered the recommendations of the joint panel commissioned by the Association of Schools of Public Health and the Association of American Medical Colleges to develop a set of core cultural competencies appropriate for medical and public health students. Those competencies are meant to support the development and delivery of appropriate population health services for a diverse population including the underserved, and to remediate disparities. UC Irvine’s MPH emphasis merges particular cultural issues with social and behavioral factors affecting the health of populations, and is specifically accommodates training in the diverse population profile of Orange County and Southern California, and is relevant to UC Irvine’s Program in Medical Education for the Latino Community (PRIME-LC).

After earning the MPH degree with an emphasis in Sociocultural Diversity and Health, students will be able to:

I. Recognize, identify, and describe how behavioral and sociocultural factors at the intrapersonal, interpersonal, community, and macro levels affect health status and behavior across the lifespan, including how these factors relate to health disparities across diverse populations.

II. Apply social, behavioral, and cultural theory to analyze determinants and correlates of public health problems and their interrelationships, with the aim of creating testable conceptual models depicting a public health problem, its determinants, and correlates.

III. Develop goals and objectives for health behavior change intervention programs targeted at populations at risk for specific public health problems.

IV. Recognize and describe socioeconomic, political, cultural, and bio-behavioral factors as they affect population health, as gleaned from cases studies of past or present epidemics.

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7 UC Irvine Program in Medical Education for Latino Communities. [http://www.meded.uci.edu/primelc/](http://www.meded.uci.edu/primelc/)
V. Develop and execute proposals grounded in theories of sociocultural and behavioral science for addressing problems in public health, including formulation of hypotheses about specific health determinants in a vulnerable and diverse community, through liaison with a public health agency.

VI. Demonstrate the skills and knowledge necessary to effectively communicate health behavior and relevant sociocultural information, grounded in subject-specific literature and theory, in the context of public and professional settings, including: conferences, health departments, communities, private industry, and other public health focused settings.

Selective Courses for MPH Emphasis in Sociocultural Diversity and Health

242 Theories of Health Communication (4). Explores the concepts, constructs, and theories of communication in health and risk contexts. Examines interpersonal, family, organizational, and mediated communicative processes about health care and conditions from a global perspective. Prerequisite: graduate standing.

245 Health Promotion Planning (4). Introduces strategic planning integral to intervention planning in public health practice and research, emphasizing the fundamental domains of social and behavioral health science and practices. Students develop an intervention plan for a specific health problem, health behavior, and target population. Prerequisite: graduate standing.

246 Social Research Methods (4). An interactive graduate seminar covering topics related to the research process and study design. Begins with conceptualizing research questions, hypotheses, and then turns to topics in measurement and concludes with experimental, quasi-experimental, and observational study designs. Prerequisite: graduate standing.

259 Special Topics in Social and Behavioral Health Sciences (4). Current research in Social and Behavioral Health Sciences. Topics vary from quarter to quarter. May be repeated for credit as topics vary. Prerequisite: graduate standing or consent of instructor.

SOC 263 The Sociology and Demography of Health and Illness (4). Health from a population perspective. Topics include pandemics; the “McKeown debate” (standard of living vs. public health vs. medicine); long-term health changes in developed countries; health and socio-economic status; immigrant health.

282 Advances in Global Health (4) The global burden of disease, the underlying sectoral determinants of health, and health systems development through multiple frames, including: health economics, infectious and chronic disease, nutrition, unintentional and intentional injury, culture, social and political organization, humanitarian emergencies and international organizations.