



स्वामी राम हिमालयन विश्वविद्यालय
Swami Rama Himalayan University

Criterion 1 - Curricular Aspects

1.1.1 Outcome Analysis of POs, COs

M.Sc. Epidemiology

(2021-2023)

Himalayan Institute of Medical Sciences

Swami Rama Nagar, Jolly Grant, Dehradun 248016, Uttarakhand, India

A. Program Outcomes

After successful completion of the program, graduating students/graduates will able to:

| | |
|------------|---|
| PO1 | Ability to apply the knowledge of Epidemiology & Biostatistics like analyzing & interpreting the data |
| PO2 | Ability to conduct any study/research/project based on appropriate study designs. |
| PO3 | Ability for efficient communication skills with the community/society. |
| PO4 | Ability to work independently as well as in a multi-disciplinary team with leadership skills to monitor & evaluate the Public Health Program. |
| PO5 | Ability and desire to engage in Lifelong learning & to use technical problem-solving skills. |




B. Course-wise CO-PO Mapping

Mapping factor or Correlational level between Course Outcome (CO) and Program Outcomes (PO) indicates to what extent the teaching and assessment method of CO correlates/contributes the PO at the level defined below:

| Corelation Level | Particulars |
|------------------|--|
| 3 | Substantial/high contribution of CO towards PO |
| 2 | Moderate contribution of CO towards PO |
| 1 | Slight/low contribution of CO towards PO |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|----------------|---|-------------------------------------|--------------|--------------|--------------|--------------|
| | | PO1 | PO1 | PO1 | PO1 | PO1 |
| CMEP501 | General Epidemiology & Basic Biostatistics | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO1 | Provide insight into the basic concepts of health, well-being, diseases, control, and modes of intervention in the prevention of diseases. | 2 | | 1 | | 1 |
| CO2 | Develop knowledge about basic statistics which can be applied to real-time scenarios. | 3 | 3 | | | 1 |
| CO3 | Acquire skills in types of data, methods of collecting the data, data entry, coding, data cleaning, editing, analyzing the data, and presenting the data. | 2 | 3 | | 1 | 1 |
| | Course-wise PO Average | 2.333 | 2.000 | 0.333 | 0.333 | 1.000 |




1.1.1 Outcome Analysis of POs, COs – M.Sc. Epi (2021-2023)

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|---|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEP502 | Introduction to environmental, Occupational, Nutritional and Genetic Epidemiology | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Anticipate the physical, chemical, and biological agents of environmental contamination, their vectors for dissemination (air, water, soil) into the environment, and how the body reacts to them using appropriate case studies; industrialization and susceptible populations; emerging global environmental health problems and current policies and legislations. | 2 | 2 | 1 | 1 | 2 |
| CO 02 | Identify various occupational diseases and suggest preventive measures and safety measures for industrial accidents. | 2 | 2 | 2 | 1 | 2 |
| CO 03 | Understand and Recognize the burden of nutritional disorders of public health importance. | 3 | 3 | 2 | 2 | 2 |
| Course-wise PO Average | | 2.333 | 2.333 | 1.667 | 1.333 | 2.000 |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|--|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEP503 | Introduction to Psychosocial, Clinical and Pharmaco-epidemiology | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO1 | Ability to understand the clinical aspect of epidemiology and its impact on people's health and well-being. | 3 | 3 | 1 | 3 | 3 |
| CO2 | Develop appropriate epidemiologic methods for mental health problems in the population. | 2 | 2 | 2 | 2 | 2 |
| CO3 | Comprehend the concept of pharmaco-epidemiology and its application in studying drug safety and its effectiveness. | 3 | 3 | 1 | 2 | 2 |
| Course-wise PO Average | | 2.667 | 2.667 | 1.333 | 2.333 | 2.333 |



1.1.1 Outcome Analysis of POs, COs – M.Sc. Epi (2021-2023)

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|--|-------------------------------------|--------------|----------|--------------|--------------|
| CMEP504 | Applied Epidemiology & Biostatistics | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Understand the basic concepts of biostatistics & and its applications in epidemiology | 3 | 3 | | 2 | 2 |
| CO 02 | Compute and interpret various statistical measures and techniques used in collecting data. | 3 | 3 | | 2 | 2 |
| Course-wise PO Average | | 3.000 | 3.000 | - | 2.000 | 2.000 |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|---|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEP505 | Epidemiological Study Designs & Basics of Research Methodology | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Have expertise in basic and applied aspects of epidemiological study designs. | 3 | 3 | 2 | 3 | 3 |
| CO 02 | Appreciate the role of research in public health practice, with emphasis on the basics of research, the applied aspect of research in public health, and mastering the art of writing a quality research paper as well as critically appraising a published research article. | 2 | 3 | 1 | 2 | 2 |
| Course-wise PO Average | | 2.500 | 3.000 | 1.500 | 2.500 | 2.500 |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|--|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEP506 | Causation in Epidemiology, Disease Prevention and Screening | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Acquire detailed knowledge on causation and association of a disease with Hill's criteria, and about bias and confounding. | 1 | 1 | | | 3 |
| CO 02 | Apply different modes of intervention based on levels of prevention. | 2 | 1 | | | 2 |
| CO 03 | Skillfully conduct any screening tests in the field. | 3 | 2 | 2 | 2 | |
| Course-wise PO Average | | 2.000 | 1.333 | 1.000 | 1.000 | 2.000 |



1.1.1 Outcome Analysis of POs, COs – M.Sc. Epi (2021-2023)

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|--|-------------------------------------|--------------|----------|--------------|--------------|
| CMEP507 | Advanced Biostatistics and Data Handling | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Design and carry out the analysis using different techniques of advanced biostatistics. | 2 | 2 | | 1 | 2 |
| CO 02 | Perform analysis in case of missing data and get familiar with the concepts of various probability distributions, fallacies in biostatistics, and concepts of meta-analysis. | 3 | 3 | | 2 | 2 |
| CO 03 | Apply the knowledge of Microsoft Excel, SPSS & other data analysis tools. | 3 | 3 | | 1 | 3 |
| CO 04 | Interpret the disease registry system, hospital- based registry system, disease registers and the registry data analysis. | 1 | 1 | | 1 | 2 |
| Course-wise PO Average | | 2.250 | 2.250 | - | 1.250 | 2.250 |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|---|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEC001 | Environmental & Occupational Epidemiology | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Appreciate the role of environmental and occupational epidemiologist for creating public health policies. | 2 | 2 | 3 | 3 | 2 |
| CO 02 | Analyze the exposure and effect relationship for environmental health problems. | 3 | 3 | 1 | 2 | 2 |
| CO 03 | Identify environmental hazards and carry out environmental studies for exposure-risk assessment. | 3 | 3 | 3 | 3 | 3 |
| Course-wise PO Average | | 2.667 | 2.667 | 2.333 | 2.667 | 2.333 |

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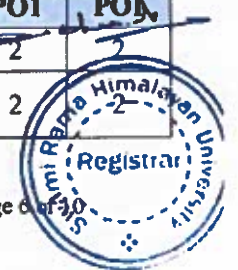


1.1.1 Outcome Analysis of POs, COs – M.Sc. Epi (2021-2023)

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|---|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEP508 | Epidemiology of Common Diseases | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Acquire knowledge on the concepts of infectious disease epidemiology including outbreak investigation, dynamics of infectious disease transmission, prevention, and control of infectious disease transmission, | 3 | 3 | 3 | 3 | 3 |
| CO 02 | Understand the concept of non-communicable diseases (NCDs), epidemiology of cardiovascular diseases (CVDs), screening for diseases, National Programme for NCDs (NPCDCS). | 3 | 3 | 3 | 3 | 3 |
| Course-wise PO Average | | 3.000 | 3.000 | 3.000 | 3.000 | 3.000 |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|---|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEP509 | Health Care Planning & Management (including Health Economics & budgeting) | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Play role of manager in public healthcare sector. | 3 | 3 | 3 | 3 | 3 |
| CO 02 | Analyze the benefits of strategic planning to increase the operational efficiency and to enhance the outcome of healthcare sector. | 3 | 1 | 3 | 3 | 3 |
| CO 03 | Recognize the basic and critical insights about budgeting and understand the importance of Planning Programming Budgeting system (PPBS), and patterns of health care financing. | 1 | 2 | 2 | 2 | 2 |
| Course-wise PO Average | | 2.333 | 2.000 | 2.667 | 2.667 | 2.667 |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|----------------|---|-------------------------------------|------------|------------|------------|------------|
| CMEP510 | Risk Assessment & Risk Management (including Public Health Surveillance & Monitoring) | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Comprehend the basic principles of risk assessment and risk management. | 2 | 2 | 2 | 2 | 2 |
| CO 02 | Enumerate the different types of risk assessment methods, and describe models of risk assessment, and Bayesian tools for risk assessment. | 2 | 3 | 1 | 2 | 2 |



1.1.1 Outcome Analysis of POs, COs – M.Sc. Epi (2021-2023)

| | | | | | | |
|-------------------------------|---|--------------|--------------|--------------|--------------|--------------|
| CO 03 | Empower himself/herself regarding public health surveillance and the essential activities involved in the surveillance and monitoring of a disease. | 3 | 3 | 3 | 3 | 3 |
| CO 04 | Perform surveillance activity in a given scenario to solve a specific health problem. | 3 | 3 | 3 | 3 | 3 |
| CO 05 | Design a plan for conducting surveillance of the problem and monitoring of the program. | 3 | 3 | 3 | 3 | 3 |
| Course-wise PO Average | | 2.600 | 2.800 | 2.200 | 2.600 | 2.600 |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|---|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEC003 | Nutritional Epidemiology | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Comprehend the knowledge on basic and applied aspects of nutrition and role of nutrition in Health and Disease. | 3 | 3 | 3 | 2 | 3 |
| CO 02 | Discern the Nutritional epidemiology of Diseases and understand the nutritional requirements of special groups. | 3 | 3 | 3 | 2 | 3 |
| Course-wise PO Average | | 3.000 | 3.000 | 3.000 | 2.000 | 3.000 |

| Course Code | Course Title | CO-PO Mapping (Articulation Matrix) | | | | |
|-------------------------------|--|-------------------------------------|--------------|--------------|--------------|--------------|
| CMEC005 | Maternal and Child Health | | | | | |
| CO# | At the end of the course the students will be able to: | PO1 | PO1 | PO1 | PO1 | PO1 |
| CO 01 | Acquire knowledge about family planning methods, maternal and child health care indicators and different maternal and child related health problems and about their preventive strategies. | 3 | 3 | 3 | 3 | 3 |
| CO 02 | Explain about growth and development of child and school health services, health programmes and schemes related to maternal and child health | 3 | 3 | 3 | 3 | 3 |
| Course-wise PO Average | | 3.000 | 3.000 | 3.000 | 3.000 | 3.000 |

C. Program Outcome Reference Values:

Following table calculates the overall average of all POs of the Courses and is referred as Course-wise Average of POs Reference values.

| SR. No. | Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|-------------|---|--------------|--------------|--------------|--------------|--------------|
| 1 | CMEP501 | General Epidemiology & Basic Biostatistics | 2.333 | 2.000 | 0.333 | 0.333 | 1.000 |
| 2 | CMEP502 | Introduction to environmental, Occupational, Nutritional and Genetic Epidemiology | 2.333 | 2.333 | 1.667 | 1.333 | 2.000 |
| 3 | CMEP503 | Introduction to Psychosocial, Clinical and Pharmaco-epidemiology | 2.667 | 2.667 | 1.333 | 2.333 | 2.333 |
| 4 | CMEP504 | Applied Epidemiology & Biostatistics | 3.000 | 3.000 | - | 2.000 | 2.000 |
| 5 | CMEP505 | Epidemiological Study Designs & Basics of Research Methodology | 2.500 | 3.000 | 1.500 | 2.500 | 2.500 |
| 6 | CMEP506 | Causation in Epidemiology, Disease Prevention and Screening | 2.000 | 1.333 | 1.000 | 1.000 | 2.000 |
| 7 | CMEP507 | Advanced Biostatistics and Data Handling | 2.250 | 2.250 | - | 1.250 | 2.250 |
| 8 | CMEP508 | Epidemiology of Common Diseases | 3.000 | 3.000 | 3.000 | 3.000 | 3.000 |
| 9 | CMEP509 | Health Care Planning & Management (including Health Economics & budgeting) | 2.333 | 2.000 | 2.667 | 2.667 | 2.667 |
| 10 | CMEP510 | Risk Assessment & Risk Management (including Public Health Surveillance & Monitoring) | 2.600 | 2.800 | 2.200 | 2.600 | 2.600 |
| 11 | CMEC001 | Environmental & Occupational Epidemiology | 2.667 | 2.667 | 2.333 | 2.667 | 2.333 |
| 12 | CMEC003 | Nutritional Epidemiology | 3.000 | 3.000 | 3.000 | 2.000 | 3.000 |
| 13 | CMEC005 | Maternal and Child Health | 3.000 | 3.000 | 3.000 | 3.000 | 3.000 |
| Combined Course-wise Average of POs Reference values | | | 2.591 | 2.542 | 2.003 | 2.053 | 2.360 |

D. Assessment of CO and PO Attainment Value

The attainment of the course outcome is measured at the level of 3 as follows:

| Attainment Levels | Criteria |
|-------------------|---|
| 3 | If 80% of student achieves marks greater than threshold percentage of the total score of assessment |
| 2 | If 70% of student achieves marks greater than threshold percentage of the total score of assessment |
| 1 | If 60% of student achieves marks greater than threshold percentage of the total score of assessment |
| 0 | If 60% of student achieves marks less than threshold percentage of the total score of assessment |

Attainment level of COs is measured through direct attainment of COs depending on the performance of the students in Internal Assessment (IA) and End Semester Examination (ESE) individually. For the program the threshold percentage is set at 50% for ESE and 60% for IA assessments. The weightage of attainments for IA and ESE is in proportion of 40:60.

| Sr. No. | Course Code | Course Title | Attainment of COs | Derived Attainment of POs Course-wise | | | | |
|---------|-------------|---|-------------------|---------------------------------------|-------|-------|-------|-------|
| | | | | PO1 | PO2 | PO3 | PO4 | PO5 |
| 1 | CMEP501 | General Epidemiology & Basic Biostatistics | 3.000 | 2.333 | 2.000 | 0.333 | 0.333 | 1.000 |
| 2 | CMEP502 | Introduction to environmental, Occupational, Nutritional and Genetic Epidemiology | 1.800 | 1.400 | 1.400 | 1.000 | 0.800 | 1.200 |
| 3 | CMEP503 | Introduction to Psychosocial, Clinical and Pharmaco-epidemiology | 3.000 | 2.667 | 2.667 | 1.333 | 2.333 | 2.333 |
| 4 | CMEP504 | Applied Epidemiology & Biostatistics | 3.000 | 3.000 | 3.000 | - | 2.000 | 2.000 |
| 5 | CMEP505 | Epidemiological Study Designs & Basics of Research Methodology | 3.000 | 2.500 | 3.000 | 1.500 | 2.500 | 2.500 |
| 6 | CMEP506 | Causation in Epidemiology, Disease Prevention and Screening | 3.000 | 2.000 | 1.333 | 1.000 | 1.000 | 2.000 |
| 7 | CMEP507 | Advanced Biostatistics and Data Handling | 1.800 | 1.350 | 1.350 | - | 0.750 | 1.350 |
| 8 | CMEP508 | Epidemiology of Common Diseases | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 |

1.1.1 Outcome Analysis of POs, COs – M.Sc. Epi (2021-2023)

| | | | | | | | | |
|---|---------|---|-------|--------------|--------------|--------------|--------------|--------------|
| 9 | CMEP509 | Health Care Planning & Management (including Health Economics & budgeting) | 3.000 | 2.333 | 2.000 | 2.667 | 2.667 | 2.667 |
| 10 | CMEP510 | Risk Assessment & Risk Management (including Public Health Surveillance & Monitoring) | 3.000 | 2.600 | 2.800 | 2.200 | 2.600 | 2.600 |
| 11 | CMEC001 | Environmental & Occupational Epidemiology | 3.000 | 2.667 | 2.667 | 2.333 | 2.667 | 2.333 |
| 12 | CMEC003 | Nutritional Epidemiology | 3.000 | 3.000 | 3.000 | 3.000 | 2.000 | 3.000 |
| 13 | CMEC005 | Maternal and Child Health | 3.000 | 3.000 | 3.000 | 3.000 | 3.000 | 3.000 |
| Course-wise Average of POs Achievement Through Results | | | | 2.312 | 2.263 | 1.779 | 1.835 | 2.091 |
| Course-wise Average of POs Reference values | | | | 2.591 | 2.542 | 2.003 | 2.053 | 2.360 |
| Percentage Attainment of PO's | | | | 89.2% | 89.0% | 88.8% | 89.4% | 88.6% |

From the Attainment level of CO, the Derived PO's value for course is calculated as follows:

$$\text{Derived PO Value} = \frac{\text{CO attainment} \times \text{respective PO average}}{3}$$

Depending on derived PO values of the courses, calculate the Course-wise Average of POs achievement for each PO.

Calculate the percentage attainment of PO's as follows:

$$\text{Percentage attainment of PO's} = \frac{\text{Average PO Attainment through}}{\text{average PO refrence value}} \times 100$$

