

**Course Details for Part-IV BPH (Hons); Semester-I Examination**

<b>PHI 4101: Hospital Management</b>	<b>Credit Hour: 03</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> Health care system of a country contribute in determining the Health status of its population. There is a very few organization who is producing expert in hospital management which is a distinctive field of specialized knowledge to run a hospital either academic or non-academic, private or public of any number of bed strength. Most of the time people’s dissatisfaction against hospital is management related. Furthermore, this course will give a better understanding of the young learner about the role of a hospital in prevention and cure of diseases. This course will help the students to be a skilled manager to run a tertiary level of modern hospital of 21<sup>st</sup> century in home and abroad. At the same time, the student will be acquainted with the health care from primary level to tertiary level hospital and expected to develop a sound referrer system in developing country like Bangladesh.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. know the about hospital and its functions, and the history of formation of hospital;</li> <li>2. identify the challenges of hospital managements;</li> <li>3. capable to control nosocomial infection and dispose hospital waste scientifically;</li> <li>4. manage the hospital effectively and efficiently in HR, Finance, Utility and Support services;</li> <li>5. be an expert in planning and designing a hospital and formulation of development planning project (DPP) as per need of the people.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
A. Definition of Hospital; Meaning of Hospital; Hospital as a social organization; History of Hospital.	1. understand the basic concept of hospital;	
B. Health Care delivery system of Bangladesh; Level of Health care; Common complaint against hospitals of Bangladesh.	2. acquainted with health care system in Bangladesh;	
C. What is System; Organization viewed as a system; Uniqueness of a hospital; Functions of hospital; Hospital services and managements.	3. learn about systematic approach and management of hospital;	
D. Hospital planning and designing: Hospital planning; Sight selection and hospital architecture; DPP; Organogram.	4. design hospital organogram and its planning;	
E. What is management? Fayol’s principle of management; Functions of managements;	5. know the basic concept of management	

Leadership; Administration and management; Directing and Leading.	
F. 5S Kaizen; TQM and Hospital management improvement.	6. learn about the total quality service management of hospital;
G. Public relation; Hospital public and conflict managements; People's perception and patient satisfaction.	7. know about the hospital public and management of conflict;
H. Infection; Chain of infection; Hospital infection control; Infection control team; CSSD.	8. identify the chain of hospital infections and manage its control;
I. Hospital waste management; strategy Types of waste; Health hazards; Colour coding; Segregation; Scientific disposal.	9. learn the effective hospital waste management strategies to reduce health hazards;
J. Emergency services management and SOP, ABC, ALS; ICU, CCU management.	10. orient with the emergency service management and management of the ICU, CCU;
K. Legal issues in Hospital: TORTs, Battery, Felony, defamation of character, Res-ispaliquitor, Fraud, organ transplantation; Ethical issues in hospital; patient right, privacy, doctor patient consultation, malpractice and negligence.	11. know and the legal issues in medical settings;
L. Medical audit background; what to be audited; prerequisite stages and types; medical records.	12. understand about the medical records and audit;
M. Support and utility services; Inventory control; material management; dietary managements.	13. know about the hospital services;
N. Personnel management; HRM and financial managements; Budget and audit; Hospital statistics.	14. understand the financial management and hospital statistics.
<b>Recommended Readings:</b>	
<ol style="list-style-type: none"> <li>1. Sharma Y., Sarma, R.K., Gomes. L. A. 2013. Hospital Administration Principles and Practice.</li> <li>2. Buchbinder, Sharon B. and Shanks, Nancy H. 2007. Introduction to Health Care Management. Jones and Bartlett Publication.</li> <li>3. Salauddin, A.K.M. 1999. Hospital Management.</li> <li>4. Joshi, D.C. and Joshi, M. 2009. Hospital Administration, Jaypee Brothers Publication.</li> </ol>	

<b>PHI 4102: Health Policy and Planning</b>	<b>Credit Hour: 03</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> Health policies and planning are an inescapable and critical components for guiding the planners, service providers and executers of a country to build a healthy and productive nation. The accessibility, cost, and quality of health care; the country's preparedness for natural and human-caused disasters; the safety of the food, water, and medications we consume; the right to make individual decisions about one's own health and well-being; and scores of other important issues are at the heart of health policy and planning, and in turn at the heart of individual and community health and well-being. Health policies and plans have a strong and lasting effect on the quality of our lives as individuals and on our safety and health as a nation. The overall aim of this course is to introduce the students how to formulate and implementation of national policies. This course will equip the students with methods, tools and techniques to analyze health and health care policies and governance arrangements, initiate policy change and strategies for better health and health care implementation.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. comprehend and demonstrate knowledge and critical understanding of key principles of a diverse range of national and international health policies, including current and emerging trends;</li> <li>2. demonstrate knowledge and critical understanding of key principles of health policy, planning and financing;</li> <li>3. analyze health policy processes and governance arrangements using appropriate theories, methods and tools;</li> <li>4. explain the roles that different categories of actors and networks play in different phases of the policy process, its planning and implementation, and in governance frameworks.</li> <li>5. apply their conceptual and theoretical knowledge and skills using a multidimensional approach to formulate, design, implement, evaluate and appraise health policies and plans;</li> <li>6. show competence, both written and verbal, in assessing and communicating empirical evidence and in consolidating and critically appraising debates relevant to issues of health policy;</li> <li>7. develop and present policy or institutional change scenarios with a view of strengthening health systems to achieve the objective of Universal Health Coverage.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<p><b>A. Introduction:</b> Concept of policy, planning, formulation and planning cycle; Execution and Evaluation of the plan; Need, Demand and Resources; Objectives, targets and goals</p>	<p><b>1.</b> Describe the concepts of policy, planning and management and integrate knowledge and analyse the targets and goals to assess needs and execute plans.</p>	
<p><b>B. Understanding the Role of and Conceptualizing Health Policy and Law:</b></p>		

<p>Role of Policy and Law in Health Care and Public Health; Conceptualizing Health Policy and Law; The Three Broad Topical Domains of Health Policy and Law; Social, Political, and Economic Historical Context; Key Stakeholders.</p>	<p>2. Describe generally the important role played by policy and law in the health of individuals and populations.</p>
<p><b>C. Policy components &amp; parameters, and Policymaking Process:</b> Parameter upon which policy formulation takes place: Health indicators, Health care infrastructure, Objective and strategy, Health care systems; Identifying Public Problems; Structuring Policy Options; Public Policymaking Structure and Process; The Health Bureaucracy.</p>	<p>3. Understand key policy components and parameters in order to rank the health indicators and health care infrastructure.</p>
<p><b>D. Health Policy in Britain:</b> The policy-making process in Britain central government; Making and changing health policy in Britain; Health policy implementing strategies in Britain; Strategies for monitoring and evaluating health policy in Britain.</p>	<p>4. Analyze the political context of health policy and examine the monitoring and evaluation of health policy in Britain.</p>
<p><b>E. National Health Policy of Bhutan:</b> Health and Development in Bhutan; Vision, Mission and Aspirations of Bhutan's Health Policy; Health System of Bhutan; Disease Control and Medical Care; Partnership approaches of Bhutan in Health.</p>	<p>5. Understand and analyze the vision, mission and aspiration of Bhutan's health policy and their health system.</p>
<p><b>F. Health Policy in Bangladesh:</b> National Health Policy 2011 (Draft); Components of National Health Policy of Bangladesh; Salient features of health policy; principle of health policy; Constitutional support, Aims and objectives; Challenges and drawbacks in Bangladesh; Work plan; Comparison of health policy of Bangladesh with one of the other regional and one extra regional country; Evaluation, monitoring and assessment strategies.</p>	<p>6. Learn the key policy components, principles and pillars of Bangladesh health policy and key implementation challenges and analyse the political context of health policy and examine the monitoring and evaluation of health policy in Bangladesh.</p>
<p><b>G. National declarations in summits and international conferences:</b> Public health priorities in national health policy; Population policy; Health policy and planning in MDGs; Health policy and planning in SDGs; Universal Health Coverage and post-2015 agenda.</p>	<p>7. Understand the public health priority issues of a national health policy.</p>
<p><b>H. Understanding Health Insurance Policy:</b> A brief history of the rise of health insurance; How Health insurance operates; Managed care;</p>	<p>8. Define the basic elements of health insurance; Differentiate various insurance products and Discuss health policy issues relating to health insurance.</p>

Government health insurance programs in a developed country and Bangladesh.	
<p><b>I. Public Health Preparedness Policy:</b> Defining Public Health Preparedness; Threats to Public Health; CBRN Threats; Naturally Occurring Disease Threats; Natural Disasters; Man-Made Environmental Disasters; Public Health Preparedness Policy; Country Response Agencies and Offices; Preparedness Statutes, Regulations, and Policy Guidance; Political Directives; International Agreements.</p>	<p><b>9.1</b> Describe what public health preparedness is and understand the scope of events that can lead to a public health emergency and the key policies and laws that support public health preparedness and the infrastructure that has been built to support preparedness activities at the federal, state, and local levels.</p>
<p><b>J. Policy implementation:</b> Early approaches to explaining policy implementation – ‘Top-down’ and ‘Bottom-up’ approaches, its management and new formation; The policy sub-system or advocacy coalition framework; Strategy for planning and managing the implementation of change; Global and local challenges and drawbacks in health policies.</p>	<p><b>10.</b> Understand approaches to analyzing policy implementation including those that attempt to synthesize insights from both ‘top-down’ and ‘bottom-up’ perspectives and how some of the factors that facilitate or impede the implementation of policies.</p>
<p><b>K. Basic Skills in Health Policy Analysis:</b> The Art of Structuring and Writing a Health Policy Analysis – Policy Analysis Overview: Client-Oriented Advice; Informed Advice; Public Policy Decision; Providing Options and a Recommendation; Client’s Power and Values; Multiple Purposes. Structuring a Policy Analysis: Problem Identification; The Background Section; The Landscape Section; The Options Section; The Recommendation Section.</p>	<p><b>11.</b> Analyze the health policy issue.</p>
<p><b>Recommended Readings:</b></p>	
<ol style="list-style-type: none"> <li>1. Sara E. Wilensky and Joel B. Teitelbaum. 2020. Essentials of Health Policy and Law. 4th Edition. Jones &amp; Bartlett Learning. ISBN: 9781284151619</li> <li>2. Kent Buse, Nicholas Mays and Gill Walt. 2012. Understanding Public Health: Making Health Policy. Second edition. McGraw-Hill Education, Open University Press. ISBN-10: 0-33-524634-6 (pb)</li> <li>3. Christopher Ham. 1999. Health Policy in Britain: The Politics and Organisation of the National Health Service. Fourth Edition. MACMILLAN PRESS LTD. ISBN: 978-0-333-76407-7.</li> <li>4. Moonesar, I. A. 2013. U.S. Public Health Policy: A Current Briefing. Chartridge Books Oxford. ISBN print: 978-1-909287-86-0; ISBN ebook: 978-1-909287-87-7.</li> <li>5. Robert Burke &amp; Leonard Friedman. 2011. Essentials of Management and Leadership in Public Health. Jones &amp; Bartlett Learning.</li> <li>6. Bangladesh National Health Policy 2011. Available at: <a href="http://www.mohfw.gov.bd/index.php?option=com_content&amp;view=article&amp;id=74&amp;Itemid">http://www.mohfw.gov.bd/index.php?option=com_content&amp;view=article&amp;id=74&amp;Itemid</a></li> </ol>	

<b>PHI 4103: Health Education and Health Promotion</b>	<b>Credit Hour: 03</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> This course focuses on the theoretical aspects, methods and media of health education, promotion and health related behaviours so that students can understand its role in modifying human behaviour for healthier and productive life. The students will enable to identify health promotion challenges, opportunities for solving public health problems and issues. In essence, the course will provide knowledge and the students will acquire practical skills in health education and promotion as a future public health specialist in individual, group and community level.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. know what does health education and promotion means and will identify the theories and methods;</li> <li>2. describe the historical development of health education and promotion and differentiate between health promotion and health education.</li> <li>3. create appropriate methods and media for health education and promotion.</li> <li>4. identify health needs, community diagnosis, planning, organizing, implementation, monitoring and evaluation for health education and promotion programme.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<p><b>A. Introduction to health education:</b> Definition, concepts, components, philosophy and principles of health education; Aims &amp; objectives; Changing concepts; Determinants of health; Key factors of sociocultural barriers; Approaches &amp; models of health education.</p>	<ol style="list-style-type: none"> <li>1. Know the basic concepts and barriers of health education and promotion.</li> </ol>	
<p><b>B. Historical development of health education:</b> Underling disciplines and contribution of related field in health education; Stages in the development of health educational process: health propaganda; health education/pedagogy.</p>	<ol style="list-style-type: none"> <li>2. Understand theoretical frameworks and scientific evidence for teaching-learning and health promotion.</li> </ol>	
<p><b>C. Social psychology and health education:</b>  <b>Attitudes to health:</b> perception and prejudices; Factors that formulate changing attitudes; Culture, social norms and standards, and health culture; characteristics of personality.</p>	<ol style="list-style-type: none"> <li>3. Be able to explain the relationships between the psychology and working environment.</li> </ol>	

<p><b>D. Principles of communication:</b> Scope, purpose, definitions and methods of communication; barriers in communication; determinants of communication effectiveness – skills, attitudes knowledge levels; Socio cultural values, desires etc.; Inhibitors of communication flow coding or complexity.</p>	<p>4. Understand communication and its barriers and cope up with the challenges of the communication.</p>
<p><b>E. Educational intervention, teaching pedagogy and factors facilitating change:</b> Teaching pedagogy; curriculum; methods of teaching work; adult education and lifelong learning; predisposing, enabling and reinforcing factors; <b>Learning process:</b> theories; principles, characteristics etc., development and operation of health education services in Bangladesh.</p>	<p>5. Apply principles of health literacy when designing printed and health information for a selected community group.</p>
<p><b>F. Forms and methods in health education:</b> Basic forms of health education; Classification; Individual, group and mass method health educational methods; Evaluation of effectiveness of the applied methods.</p>	<p>6. Be able to reflect on the forms and methods of health education and apply proper tools for promoting health needs.</p>
<p><b>G. Tools for education and health communication - teaching resources:</b></p> <p>Types of tools for education and communication; Characteristics of audio, video and audio-visual aids; Specific media and their uses; Means of mass media and communication; Application of tools for health education.</p>	<p>7. Identify community resources that support selected health promotion behaviours.</p>
<p><b>H. Equipment operation and maintenance:</b> Maintenance of film, slide, filmstrip, overhead, projectors, recorders, magnetic and optic sound projectors etc.; Media production.</p>	<p>8. Apply and use evidence-based methods and learn how to maintain equipments.</p>
<p><b>I. Health promotion:</b> Interventions; Methods and contribution to health development; The special input e.g. school children; drug abusers; cancer survivor patients etc.</p>	<p>9. Integrate evidence-based teaching/learning strategies in the design of a health promotion project.</p>
<p><b>J. Evaluation and pre-testing of materials:</b> Word familiarity, understanding scale, survey; Planning, organizing and conducting meetings etc.; Compiling inventory of community media and communication channels etc.; Indigenous media.</p>	<p>10. Be able to apply independently measure and evaluation methods at health promotion work.</p>
<p><b>K. Management of health education and promotion:</b> Informal and formal health education, facilities and its management; health education for special health groups; ethical issues in health education and promotion.</p>	<p>11. Able to manage health education programmes and sensitize the ethical issues on group and organizational level.</p>
<p><b>Recommended Readings:</b></p>	

1. Sharma M. 2016. Theoretical Foundations of Health Education and Health Promotion. Jones & Bartlett Learning; 3rd Edition.
2. Miller, M., and Stoeckel, P. 2019. Client Education: Theory and Practice (3<sup>rd</sup> Ed). Burlington MA: Jones and Bartlett Learning ISBN 978-1-284-14263-1.
3. Connolly M. 2018. Skills-Based Health Education. Jones & Bartlett Learning; 2nd Edition.
4. Maria A. Koelen and Anne W. Van den Ban. 2004. Health Education and Health Promotion. Washington Academic Publishers.
5. Eva I. Doyle, Susan E. Ward, et al. 2018. The Process of Community Health Education and Promotion, Waveland Press, Inc.; 3rd Edition.
6. Carole Lium Edelman APRN MS CS BC CMC and Elizabeth C. Kudzma DNSc. 2017. Health Promotion throughout the Life Span. Mosby; 9th Edition.
7. [James F. McKenzie](#), Brad L. Neiger, et al. 2016. Planning, Implementing, & Evaluating Health Promotion Programs: A Primer. Pearson; 7th Edition.

<b>PHI 4104: Disaster and Public Health Preparedness</b>	<b>Credit Hour: 02</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> Disasters, natural or man-made result in untold misery on the human beings and adverse impacts on the community. The frequency and intensity of disasters are mounting with every passing day as experienced in the past decade. Bangladesh being a disaster-prone country, the purpose of this course is to familiarize students with different types of the disasters that the country faces and the disaster management options practiced in the country. Students will be able to know about the negative consequences of disasters on human health.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. able to apply knowledge of science to the solution of complex disaster problems and to design solutions for prevention, preparedness, mitigation and response to disaster situations;</li> <li>2. Enable to carry out vulnerability and risk assessments in a methodical way and to create, select and apply appropriate techniques, resources, and modern tools to complex disaster activities.</li> <li>3. develop an ability to work and communicate effectively, as an individual or in a team, on multifaceted and/or multidisciplinary settings of complex disaster management projects with the community and society at large.</li> <li>4. acquainted with government framework, policies, acts and various organizational structure associated with a disaster emergency;</li> <li>5. enable to identify various health impact of disasters and plan accordingly.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	



	By the end of this course students will be able to –
<b>A. Disaster Concepts:</b> Introduction, objectives, Classification of disasters; Terms and concepts used in disaster management; Some of the major disasters in Bangladesh; Hazard and its classification; Community risk assessment, Vulnerability; Comprehensive disaster management (CDM) approach; Bangladesh disaster management models and approaches.	1. Understand the basic concepts & principals in Disaster Management.
<b>B. Regulatory and Intuitional Framework in Bangladesh:</b> Regulatory framework of Bangladesh DM systems, Institutional Framework of Bangladesh DM system, Standing Orders on Disasters and roles of DMC(s).	2. Understand the disaster management frameworks, legislations and evaluate policies in the context of Bangladesh.
<b>C. Disaster management-Bangladesh Perspectives:</b> Flood; Water Storm; Tidal surge; Cyclone; Tornado; Earthquake; Tsunami; Landslide; Arsenic Pollution; Drought; Extreme Weather; Accident.	3. Describe the physiography of Bangladesh with understanding various types of natural hazards and its remedies.
<b>D. Disaster and Public Health Preparedness and Response mechanism:</b> Disaster management cycle, Response mechanism, steps for emergency response, Communication during disasters, Emergency operation system (control room), Camps, Warning signals in Bangladesh and its information/message dissemination, Evacuation and evacuation equipment, Search and rescue of vulnerable communities, Public critical services	4. Interpret preparedness, mitigation and emergency response and management.

restoration, Damage, loss and needs assessment and information dissemination.	
<p><b>E. Disaster, Recovery, Rehabilitation and Reconstruction:</b> Concepts and principles of early recovery, concepts of development relief, Stakeholder, community involvement and participation, Recovery interventions.</p>	<p>5. Illustrate the basic elements of recovery, rehabilitation and reconstruction in disaster management.</p>
<p><b>F. Health hazards after natural disasters in Bangladesh:</b> The immediate effects of natural disasters – direct effect, Immediate-indirect medical consequences of natural disasters, Diseases associated with crowding, Short term and long-term impacts of disaster, common misconception on disaster response and effect on health, Disasters and communicable diseases, risk factor and onset of communicable diseases following a disaster, Impacts on mental health.</p>	<p>6. Explore the relationship between disasters and Health and know strategies for Health response in DM.</p>
<p><b>G. Case Studies:</b> Disaster prevention and mitigation, disaster preparedness for effective response; Disaster, recovery, rehabilitation and reconstruction; Disaster and sustainable development; Special care for the vulnerable groups like menstruating women, lactating mothers, children, senior citizen, people with comorbid conditions, etc.</p>	<p>7. Assess disaster vulnerabilities</p>
<p><b>Recommended Readings:</b></p>	
<ol style="list-style-type: none"> <li>1. GOB, Standing orders on Disaster, Min of DM &amp; RDMB, Dhaka</li> <li>2. Carter, W, Nick, 1999. Disaster management: a disaster manager’s handbook, ADB, Manila, Philippines.</li> <li>3. Smith, 1995, Environmental Hazard, 2nd edition.</li> </ol>	

4. Paul, B.K., 2011, Environmental Hazards and Disasters: Contexts, Perspectives and Management, Copyright © 2011 John Wiley & Sons, Ltd. DOI: 10.1002/9781119979616
5. S.C. Sharma and Vineet Kumar 2014. Safety Occupational Health and Environmental Management In Construction. Khanna Publishers.
6. Richard Skolnik. 2012. Global health 101, second edition. Jones & Bartlett Learning.
7. Park, K. 2011. Textbook of preventive and social medicine. Banarsidas Bhanot Publishers.

<b>PHI 4105: Gerontology : Bangladesh Perspective</b>	<b>Credit Hour: 02</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> Population structure of a country, is a determinant of health and need to be addressed in public health academia. Old age pensioner, senior citizens, elderly population number in Bangladesh is rapidly increasing due to increased life expectancy at birth. Asian philosophy is different from western philosophy in old age care. Senior citizens are invisible working force and think tank of a country and marginalized which is not desirable. Geriatric medicine yet not developed in our country and is not the only way to get rid of. Special attention in this field is a dire need. So incorporation of this topic in public health academia is a time honored decision.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. understand about population structure in Bangladesh and global scenario of the aged by the students;</li> <li>2. learn the process of biological aging and social construction of the aged will be understandable to the future public health specialist. Student will learn the pathophysiology of aging and will be able to perform geriatric assessment;</li> <li>3. contribute in program developed of aged for healthy aging. Rights of the aged and the activities of IFA will draw attention of the future public health specialist.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<b>A. Introduction:</b> Demography, Global and Bangladesh scenario of the aged, chronology and aged.	<b>1.</b> define demography and will understand population structure and global scenario of the aged (quality and quantity);	

<p><b>B. Theory of senescence and biology of aging:</b> Gene regulation theory, Somatic mutation theory, Free radical theory, Theory explaining cumulative abnormalities, Biology of aged. etc.</p>	<p>2. know the contemporary theory of aging;</p>
<p><b>C. Comprehensive geriatric assessment:</b> Locomotor systems, Cognitive functions, Vision and hearing, Nutrition, Social life of the aged.</p>	<p>3. perform geriatric assessment and identify geriatric problem;</p>
<p><b>D. Patho-physiology of Aging:</b> CVS, Respiratory systems, genitourinary systems; Mental incompetence, Homeostasis, 5I &amp; comprehensive geriatric assessment.</p>	<p>4. identify physical and mental inability of the aged and able to explain the reason;</p>
<p><b>E. Life style and healthy aging:</b> Stress; family, Income and Nutrition; Social services in community, Programs in Bangladesh.</p>	<p>5. understand the social construction of aged for healthy aging;</p>
<p><b>F. Rights of the aged and IFA (International Federation of Aging):</b> Rights &amp; responsibilities of elderly population, Care of the aged within the family vs. old age home, Global to Bangladesh scenario of the aged care for the special group, Rehabilitation of the aged, Care of the critically ill older patients.</p>	<p>6. acquainted with rights of the aged and the activities of IFA.</p>
<p><b>Recommended Readings:</b></p>	
<p>1. Colledge, N. R., Walker B. R. and Ratston S.R. 2010. Davidson’s principles and practice of Medicine, 21st edition.  2. Hall, J. E. 2011. Medical Physiology, 12th edition.  3. Kanungo, M.S. 1994. Genes and Aging. New York. Cambridge University Press  4. Kanungo, M.S. 1975. J. Theo. Biol.53: 253-61.  5. Kanungo, M.S. 1980. Biochemistry of Ageing. Academic Press, London.  6. Park, K. 2011. Textbook of preventive and social medicine. Banarsidas Bhanot Publishers.</p>	

<b>PHI 4106: Bio-safety, Bioethics and Health Rights</b>	<b>Credit Hour: 02</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> The 20th century provided horrendous examples of violence, neglect, injustice, suffering and death that resulted from disregard of fundamental values and goals of health rights. The study of ethics became a societal imperative and the international responses led to violation of the human rights, to ensure bio-safety, bioethics, health rights and ethical research practices. Ethics education is arguably a cornerstone of public health and health professional training, practice, and research. It is now largely recognized as an important and even crucial part of the education of public health. This course addresses a range of issues in public health ethics including foundational elements to the application of these elements in different subject area of public health.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. comprehend and demonstrate knowledge and critical understanding of key principles of ethics, bioethics, safety and health rights;</li> <li>2. recognize the importance of bioethics practices and guidelines in medical science and public health research;</li> <li>3. stimulate their moral imagination and improve their ability to recognize ethical issues in public health practice and research;</li> <li>4. develop analytic skills in safety, ethics and health rights issues and manage ethical ambiguity;</li> <li>5. elicit a sense of ethical obligation and responsibility for their work in public health.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<p><b>A. Introduction:</b> Definition; Understanding of Ethics, Bioethics and law; the Nuremberg Doctors’ Trials; the Universal Declaration of Human Rights (1948); the Declaration of Geneva (1948); the Declaration of Helsinki (1964).</p>	<p><b>1.</b> Interpret basic concept of ethics, bioethics &amp; biosafety.</p>	
<p><b>B. Public Health Ethics:</b> Necessary condition for any adequate account of public health ethics; The inadequacy of liberal medical ethics; Collective values: interests, goods and harms, Conceptions of social justice; Ethics in between right and wrong.</p>	<p><b>2.</b> Understand a range of areas where public health ethics ought to be directed as a means of substantive notions;</p>	
<p><b>C. Human Dignity, Rights &amp; Equality, Justice and Equity:</b> The right to life with dignity; Benefits and harm; Autonomy and individual responsibility; Respect for human vulnerability and personal integrity; Respect for cultural diversity and pluralism; Privacy and confidentiality; Non-</p>	<p><b>3.</b> Identify and define moral concern such as human dignity and rights, equality, justice and equity;</p>	

discrimination and non-stigmatization; Obligation to provide emergency medical care; Claim of ‘wrongful life’; Solidarity and cooperation.	
<b>D. Rights of patients and physicians:</b> A patient’s right to personal medical information; Information about alternative treatments; Objection to unapproved treatment; Withdrawal of medical care from minors at the terminal stage of life; Withholdings life-saving treatment; Pain relief; Right of refusal of treatment; Forced treatment of the mentally ill; Respecting patients’ decisions.	<b>4.</b> Understand the ethical boundaries of a physician and rights of a patient for seeking care and treatment.
<b>E. Informed Consent in Medical Setting &amp; Public Health Research:</b> Informed consent; Steps of Informed consent; Special importance of informed consent for irreversible drugs uses and marginalized people; Confidentiality; Additional resource for human subject for research; Components of ethics committee; Role of IRB.	<b>5.</b> Know about the key features of informed consent, persons’ confidentiality and security in medical care and public health research.
<b>F. Public Health Ethics in Contemporary Issues:</b> Infectious disease control; Vaccination ethics; Population screening; Environment, biosphere and biodiversity–Protection of the environment; the biosphere and biodiversity.	<b>6.</b> Understand and maintain ethics in contemporary issues in public health;
<b>G. Public Health Research Ethics:</b> Codes and principles; The Belmont principles; Exploitation and non-exploitation ethics in public health; Problems for Mutually advantageous, consensual, exploitation (MACE); justice and public health research ethics.	<b>7.</b> Recognize and understand the importance of different bioethics principals, guidelines, practices in medical science and public health research.
<b>H. Legal aspects:</b> Protecting a prisoner’s dignity; unauthorized sperm extraction for spousal in fertilization; Bone marrow donation by a mentally ill patient; End of life considerations; Decision on person without capacity to consent; medical treatment of teenagers.	<b>8.</b> Understand special moral and legal aspects concerning the prisoners’ life and the life of new-born and children.
<b>Recommended Readings:</b>	
<p>1. Angus Dawson (Edited). 2011. Public Health Ethics: Key Concepts and Issues in Policy and Practice. Cambridge University Press, New York. ISBN: 978-0-521-68936-6 (pbk.)</p> <p>2. Bernheim, RG; Childress, JF; Bonnie, RJ; Melnick, AL. 2015. Essentials of Public Health Ethics. Jones &amp; Bartlett Learning Publication. ISBN-13: 978-0763780463; ISBN-10: 9780763780463</p>	

3. UNESCO. 2011. Casebook on Human Dignity and Human Rights, Bioethics Core Curriculum Casebook Series, No. 1, UNESCO: Paris, 144 pp. ISBN: 978-92-3-104202-7.

4. Daniel S. Goldberg. 2017. Public Health Ethics and the Social Determinants of Health. Springer International Publishing. ISBN: 978-3-319-51345-4; ISBN: 978-3-319-51347-8 (eBook); <https://doi.org/10.1007/978-3-319-51347-8>

<b>PHI 4107: Practical: Health Education and Health Promotion</b>	<b>Credit Hour: 02</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> This practical course is the application of theory and principles of Health Education and Health Promotion to individual and community-based public health settings. Course requirements include an approved practical project work, with special concentration to field based work, related to Health Education and Health Promotion in consultation with a faculty advisor. The experience is demonstrated by an integrative paper work and presentation by using scientific application of the theories and principles to the practical aspect. Study visits/field studies within the chosen areas will be encouraged.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. teach compilation of health promotion projects, programs, developing and implementing plans and the planning of evaluations practically.</li> <li>2. help to develop in-depth knowledge and skills of the students in different areas of health education and health promotion.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<b>A.</b> Field orientation and rapport build-up. Student-activating teaching techniques such as group work, laboratory sessions, field studies and seminars.	1. demonstrate an overview of health promotion;	
<b>B.</b> Script write-up and content development for health promotion/prevention project.	2. prepare script write-up and plan health promotion projects;	
<b>C.</b> Develop projects, documentary on community specific health problems, prevention and management.	3. capable of forming and evaluating working groups for health promotion;	

D. Result dissemination and presentation in group using different methods and tools.	4. justify and debate choice of target group of the project independently;
E. Evaluating the content of the documentary and lesson learned for the future.	5. create awareness to promote health education in a changing world.
<b>Recommended audio-visual documentaries:</b>	
<ol style="list-style-type: none"> <li>1. Noonan-Gores, K. 2017. Heal. United States.</li> <li>2. Newsom, J. S. 2015. The Mask You Live In. United States.</li> <li>3. Gray, D. M. 2013. Fire in the Blood. India.</li> <li>4. Pollan, M. 2015. In Defense of Food. Penguin Press.</li> <li>5. Spottiswoode, R. And the Band Played On. 1993. United States.</li> <li>6. Sheldon, E. M. &amp; Sheldon, K. 2017. Heroin(e). United States.</li> <li>7. National Geographic. 2010. Race against the Killer Flu. United States.</li> <li>8. Anderson, K. 2017. What the Health. United States.</li> <li>9. Zehtabchi, R. 2018. Period. End of Sentence. United States.</li> </ol>	

<b>PHI 4108: Field Work: Health Aspects of Climate Change and Disaster</b>	<b>Credit Hour: 02</b>	<b>Marks: 100</b>
<b>Rationale:</b> This course is designed for field practice where students will be able to know about the implementation of disaster management options and climate change, mitigation and adaptation. Students will also be able to realize the impact of disasters and climate change on human health.		
<b>Course Objectives:</b> This course will help the students to –		
<ol style="list-style-type: none"> <li>1. get acquainted with government framework, policies, acts and various organizational structure associated with a disaster emergency and climate change.</li> <li>2. know realistically about the negative consequences of disasters and climate change on human health</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
Students will visit one of the more vulnerable areas of Bangladesh (especially costal region) due to disasters and climate change. After completion of the field visit, the students will have to present the	Familiarize students with different types of the disasters that the country faces and the disaster management options practiced in the country.	



<p>findings and then submit a report addressing these criteria given below:</p> <ul style="list-style-type: none"> <li>• Disaster preparedness and mitigation of that area;</li> <li>• Early warning, rescue and relief system;</li> <li>• Rehabilitation, reconstruction and recovery process;</li> <li>• Disaster risk reduction and community resilience;</li> <li>• Climate change mitigation and adaptation process;</li> <li>• Community risk reduction strategies;</li> </ul> <p>Health and environmental impacts of disaster and climate change.</p>	<p>Detrimental impacts of disasters and climate change on human health</p>
<p><b>Recommended Readings:</b></p>	
<p>None</p>	

<p><b>PHI 4109: Viva Voce</b></p>	<p><b>Credit Hour: 02</b></p>	<p><b>Marks: 100</b></p>
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**Course Details for Part-IV BPH (Hons); Semester-II Examination**

<b>PHI 4201: Water, Sanitation and Hygiene</b>	<b>Credit Hour: 02</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> This course aims to improve the health and learning performance of community people by reducing the incidence of water and sanitation-related diseases. In every level of society, it requires appropriate WASH initiatives that keep the environment, community, ecosystem clean and free of smells and inhibit the transmission of harmful bacteria, viruses and parasites.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. understand the basic concept and necessity of water sanitation and hygiene;</li> <li>2. understand the sustainability of water supply and sanitation;</li> <li>3. update the knowledge regarding the water pollution and its management;</li> <li>4. perceive the concept of solid waste management and waste water treatment;</li> <li>5. develop the basic skills to deal with the WASH related problems and its solution;</li> <li>6. create specific approaches for better work and planning to WASH sector;</li> <li>7. implant the insights of WASH policy through the strategic plan.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<p><b>A. Introduction:</b> Safe Water, Water Quality: Microbiological, Chemical, Physical/ Aesthetic, Radionuclide, Indicator Organisms, Water Quality Test: Turbidity, Coliform Indicator Tests, History and concept of sanitation and hygiene; Safe drinking water; Safe water for personal and workplace hygiene; Drainage, vector control and water related risks; Government, employers and workers action for safe water.</p>	<p><b>1.</b> Learn the basic concept and necessity of water sanitation and hygiene</p>	
<p><b>B. Sources of water and water supply planning:</b> Hydrologic Cycle, Surface waters, Sources of Drinking Water, Groundwater, Improved Water Supplies, Rural water sources; Urban water source; Water Source Engineering: surface water abstraction; rainwater harvesting; surface water storage; protected springs, Open channel and gravity and pumped pipe systems for water.</p>	<p><b>2.</b> Understand the sources of water and its supply planning</p>	

<p><b>C. Water pollution and treatment: Water treatment and water use;</b> Centralized water Treatment: Municipal Water Treatment, Treatment of water for industrial use; Sewage treatment; Industrial waste water treatment; Removal of solids, calcium and other metals, dissolve organics, dissolved inorganics, ; Decentralized household water treatment, Safe Storage and Treatment Processes: Disinfection, Particle Removal Technologies, Membrane / Reverse Osmosis, Combined Systems, Chemical Removal Systems; Water disinfection; Water reuse and recycling.</p>	<p>3. Identify the pollutants of water and treat the water for personal, household and industrial use</p>
<p><b>D. Sanitation:</b> Definition, Centralized wastewater treatment and reuse, Sanitary Engineering, Sewage collection systems, Excreta Disposal: sanitary collection, storage, treatment and disposal of human waste in both urban and rural setting; sanitary facilities; wastewater and faecal sludge management; Solid waste management and disposal; Government, employers and workers action for sustainable sanitation.</p>	<p>4. Know the basic concept of sanitation and its management</p>
<p><b>E. Hygiene:</b> Definition, Physical, Chemical and Biological factors of hygiene, Water and air hygiene, Hygiene of foodstuffs; Hand hygiene; Showering and bathing; Laundering; Food hygiene; Menstrual hygiene management; Government, employers and workers action for hygiene.</p>	<p>5. Learn the basic concept of hygiene and its management</p>
<p><b>F. Water, sanitation and hygiene-related diseases:</b> Water-Related Diseases: Transmission Routes and Prevention Strategies, Waterborne Diseases, Water-Washed: Water Hygiene, Diseases, Water-Based: Water Contact and Water Insect Vector borne diseases.</p>	<p>6. Understand diseases related to WASH and apply the control and prevention approaches</p>
<p><b>G. Education based WASH Policy:</b> Introduction, WASH in school, water sources, water scarcity, water pollution, water contamination; different approach to learn hygiene: child-to-child approach; personal and community hygiene activities to: (i) eye infections, (ii) hand washing, (iii) stools and hygiene, (iv) diarrhoea,</p>	<p>7. Know about the contemporary policies and interventions of WASH programs</p>

(v) other water washed diseases; Health prevention activities.	
<b>H. National Strategy of Water Supply, Sanitation and Hygiene in Bangladesh:</b> Introduction, the state of water supply and sanitation, community water supply, urban water supply, rural water supply, urban drainage, sanitation, solid waste management, capacity development; national hygiene promotion and its objectives, scope and framework, policy guidelines, guiding principles, key strategies, capacity building, monitoring and evaluation guidelines and action plan, National Hygiene Promotion Strategy for Water Supply and Sanitation Sector.	8. Determine the WASH policies of a county
<b>Recommended Readings:</b>	
<ol style="list-style-type: none"> <li>1. S.E. Manahan, 2016. Fundamentals of environmental chemistry. Lewis Publishers.</li> <li>2. National Hygiene Promotion Strategy for Water Supply and Sanitation Sector in Bangladesh 2012.</li> <li>3. Urban Sector and Water Supply and Sanitation in Bangladesh: An Exploratory Evaluation of the Programs of ADB and Other Aid Agencies Reference Number: SAP: BAN 2009-02 Sector Assistance Program Evaluation July 2009</li> <li>4. WASH at work@ a self-training hand book. Geneva: ILO, 2016</li> <li>5. Parameters of water quality; Interpretation and Standards; Environmental Protection Agency; Wexford, Ireland</li> </ol>	

<b>PHI 4202: Epidemiology-II</b>	<b>Credit Hour: 03</b>	<b>Marks: 100</b>
<b>Rationale:</b> The aim of this course is to enable students to interpret a range of epidemiological methods, advanced quantitative methods used in epidemiological studies, and to apply these methods in their own research.		
<b>Course Objectives:</b> This course will help the students to –		
<ol style="list-style-type: none"> <li>1. understand the contribution of epidemiological studies in specific areas of research, policy and practice in the areas of epidemiological methods;</li> </ol>		

<p>2. critically assess the epidemiological quality of research in a range of studies outlining the basis of methodological approach and criteria for determining the quality of the research;</p> <p>3. demonstrate sophisticated interpretation and application of epidemiological methods and principles and explain their relevance to specific study designs.</p>	
<b>Course Contents</b>	<b>Intended Learning Outcomes (ILOs)</b>
	By the end of this course students will be able to –
<b>A. Introduction:</b> Concept of cause and effect and their relationship; Definition and classification of agent, host, environment; Epidemiological triad and interrelationship; Dynamics of disease transmission.	<b>1.</b> Interpret disease frequency, cause and effect and their association.
<b>B. Epidemiological Methods:</b> Types of epidemiological studies, cohort studies, case-control studies; Precision and statistics in epidemiologic studies; Causal diagrams.	<b>2.</b> Understand different types of epidemiological studies and statistics in epidemiologic studies.
<b>C. Experimental Epidemiology:</b> Definition, aims, types; Randomized control trials; Field trial; Community trials.	<b>3.</b> Understand different types of experimental studies.
<b>D. Measurement of Association:</b> Definition, Calculation of risk ratio, rate ratio, odds ratio, absolute risk; Attributable risk and rate differences; Choosing suitable measures.	<b>4.</b> Evaluate the measurement of association and epidemiological inference.
<b>E. Epidemiological Inference:</b> Measures of Disease Frequency; Causation and Causal Inference; Types of causal relationships; Measures of Occurrence; Measures of Effect and Measures of Association; use directed acyclic diagrams to represent possible causal pathways, and describe analytical approaches exploring causality in epidemiological data.	<b>5.</b> Know the basics of Epidemiological Inference
<b>F. Clinical Epidemiology:</b> Studies of diagnostic and screening tests; Validity and reliability; Overview of screening program-cancer screening, tuberculosis, diabetes mellitus, neglected tropical diseases (NTDs);Therapy-Randomized Controlled Trials; Therapy-Nonrandomized studies.	<b>6.</b> Understand different diagnostic and screening tests and their validity and reliability

<p><b>G. Infectious Disease Epidemiology:</b> Outbreak investigation; Epidemic investigation; Quarantine, Isolation, Transmission dynamics; Response activities and mathematical modelling; Case studies to apply traditional and contemporary epidemiologic principles and methods to infectious disease research and public health practice; Program evaluation.</p>	<p>7. Describe infectious disease epidemiology.</p>
<p><b>H. Non Communicable Disease Epidemiology:</b> Causation framework, Levels of prevention, Screening.</p>	<p>8. Interpret Non communicable disease epidemiology.</p>
<p><b>Recommended Readings:</b></p>	
<ol style="list-style-type: none"> <li>1. Gordis L. (2018) Epidemiology, 6th Edition, Elsevier Saunders, Philadelphia</li> <li>2. Merrill, Fundamental Mathematics for Epidemiology Study, 2018</li> <li>3. Raymond S. Greenberg, Medical Epidemiology, 5 edition, 2015</li> <li>4. Robert Fletcher, Clinical Epidemiology: The Essentials, 5 edition, 2013</li> <li>5. Ian Dohoo, Methods in Epidemiologic Research, 2012</li> <li>6. Rothman, Kenneth J., Sander Greenland, and Timothy L. Lash. 2012. Modern Epidemiology, 3rd edition: Lippincott Williams &amp; Wilkins.</li> <li>7. Bonita, R., Beaglehole, R. and Kjellström, T. 2006 (2<sup>nd</sup> Ed.). Basic Epidemiology, World Health Organization. WHO Library Cataloguing-in-Publication Data.</li> </ol>	

<p><b>PHI 4203: Food Safety and Health</b></p>	<p><b>Credit Hour: 03</b></p>	<p><b>Marks: 100</b></p>
<p><b>Rationale:</b> This course will help handling, preparation and storage of food in ways that prevent food borne illness. Food borne disease takes a major toll on health. Thousands of millions of people fall ill and many die as a result of eating unsafe food. This course will help students to learn the trends in global food production, processing, distribution and preparation prevent new challenges of food safety and security.</p>		

**Course Objectives:** This course will help the students to –

1. understand about the food safety, security and responsible departments at national and international level;
2. know the ways of food contamination and adulteration, food adulteration acts;
3. perform systematically the identification, evaluation, and control of food safety hazards based on HACCP principles, CODEX Commission;
4. evaluate the process of food sterilization and preservation;
5. conscientise about food-borne diseases and its prevention;
6. understand the food hygiene, Safety and security, Food safety emergency.

Course Content	Intended Learning Outcomes (ILOs)
	By the end of this course students will be able to –
<p><b>A. Introduction:</b> Food safety and security; Food contaminants: Biological, chemical and physical/radiological (CBPR). Food adulteration; What departments are responsible in protecting national food sources (national vs. global, importation of contaminated foods).</p>	<p>1. understand the food safety, security, contamination and adulteration.</p>
<p><b>B. Ways of food contamination/adulteration:</b> Food hygiene; food-borne pathogens and the importance of the protection of food sources; investigation of food borne disease outbreak; seven principles of Hazard Analysis Critical Control Point (HACCP); Food adulteration acts; CODEX commission.</p>	<p>2. know the ways of food contamination/adulteration, HACCP-7 principles, CODEX, Food adulteration act.</p>
<p><b>C. Sterilization and Preservation of Foods:</b> Pasteurization; Ultra high temperature (UHT); Holder method, Flash method; high temperature and short time (HTST) method; and sterilization procedures of food.</p>	<p>3. know about Pasteurization and sterilization procedure of food for preservation,</p>
<p><b>D. Food borne diseases:</b> Burden of Foodborne Disease in Developing Countries, Vulnerable Groups at Risk of Foodborne Disease Transmission and control; Potential signs and symptoms of acute/ chronic chemical exposure to contaminated food. superbug in food, protect from superbug.</p>	<p>4. demonstrate about the food borne diseases and superbug with mood of transmission, potential sign and symptoms, prevention and control.</p>

<p><b>E. Chemical and microbiological risks associated with food:</b> Food toxicology; the assessment, management and communication; effects of genetically modified foods (GMO) on our health.</p>	<p><b>5.</b> understand about chemical and microbiological risk assessment, management and communication.</p>
<p><b>F. Food safety and security, famine and public health standards:</b> Risk assessment, risk management and risk communication; the use of food as a tool for terrorism; climate change and food security; climate change and its effects on food production, availability and prices.</p>	<p><b>6.</b> know about the process of risk assessment, management and communication; and climate change effects on food security</p>
<p><b>G. food safety emergencies:</b> The International Food Safety Authorities Network (INFOSAN) ,Global INFOSAN strategic plan,</p>	<p><b>7.</b> know about the history of INFOSAN and global strategic plan for food safety emergencies.</p>
<p><b>H.</b> Food safety and sanitation programs and related organizations (i.e. FAO) in Bangladesh; national and global issues impacting upon food safety and risk management. FAO/WHO guide for application of risk analysis principles and procedures during food safety emergencies.</p>	<p><b>8.</b> orientation of different food safety and sanitation programs in Bangladesh and related international organizations and their guideline .</p>
<p><b>Recommended Readings:</b></p>	
<ol style="list-style-type: none"> <li>1. Nambiar, V., 2004. A Textbook on Food Contamination and Safety. Anmol Publisher.</li> <li>2. Katiyar, Vinita, 2013. Food Adulteration: The Demonic Onslaught on Health Paperback.</li> <li>3. Shibamoto, T., Bjeldanes, L. F., Taylor, S. 1993. Introduction to Food Toxicology (Food Science and Technology). Academic Press.</li> <li>4. FAO/WHO [Food and Agriculture Organization of the United Nations/World Health Organization]. 2011. FAO/WHO guide for application of risk analysis during food safety emergencies. Rome. 52pp.</li> <li>5. Literature Review on Effective Food Hygiene Interventions for Households in Developing Countries Monica Woldt and Gerald G. Moy August 2015</li> <li>6. Infosan Secretariat Strategic Plan 2020-2025, World Health Organization and Food and Agriculture Organization of the United Nations, 2019</li> <li>7. Yasmine Motarjemi Huub Lelieveld Food Safety Management 1<sup>st</sup> Edition, 2013, Elsevier Publishers.</li> </ol>	



<b>PHI 4204: Data Science in Public Health</b>	<b>Credit Hour: 03</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> Data science skills are in high demand among employers across a wide array of sectors. This course will equip students with the tools and skills to manage and analyse very large datasets across healthcare systems. It will focus on the common machine learning methods and their application to solve problems in health sciences.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. develop fundamental knowledge of concepts about data science;</li> <li>2. describe the basic concepts of vectors, linear equations, linear transformations, and matrices;</li> <li>3. reduce the number of features when modeling a very large number of variables;</li> <li>4. apply appropriate machine learning methods to solve problems in public health context;</li> <li>5. explore the dataset and separate cases into groups that representing similar characteristics;</li> <li>6. modeling and forecasting time series data.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<p><b>A. Introduction:</b> Definition of Data Science, Big Data and Predictive Analytics, Artificial intelligence, Machine learning algorithm.</p>	<p><b>1.</b> Understand the basic concepts about data science and machine learning algorithm.</p>	
<p><b>B. Linear Algebra &amp; Matrix Computing:</b> Matrices, Matrix Operations, Scalars, Vectors and Matrices, Eigenvalues and Eigenvectors.</p>	<p><b>2.</b> Understand the fundamental concepts of matrix algebra with different operations of matrices.</p>	
<p><b>C. Dimensionality Reduction:</b> Principal Component Analysis (PCA), Independent Component Analysis (ICA), Factor Analysis (FA)</p>	<p><b>3.</b> Extract a set of “uncorrelated” principal variables and reduce the complexity of the data.</p>	
<p><b>D. Supervised Learning Algorithms:</b>  <i>Classification-</i> KNN algorithm, Naive Bayes algorithm, Bayes formula, Logistic Regression, Support Vector Machines.  <i>Regression Algorithms:</i> Linear regression.</p>	<p><b>4.</b> Identify or predict predefined classes and label new objects as members of specific classes.</p>	
<p><b>E. Unsupervised Learning:</b> K-Means Clustering, Hierarchical Clustering, Apriori Association Rules Learning.</p>	<p><b>5.</b> Group objects into sets, without knowing a priori labels, and determine relationships between objects.</p>	

<b>F. Big Longitudinal Data Analysis:</b> Time Series Analysis, ARIMA model, Structural Equation Modeling (SEM).	<b>6.</b> Fitting an appropriate model and forecasting future values.
<b>Recommended Readings:</b> <ol style="list-style-type: none"> <li>1. Dinov, I. V. (2018): Data Science and Predictive Analytics: Biomedical and Health Applications using R, Springer, USA.</li> <li>2. Igual, L. and Seguí, S. (2017): Introduction to Data Science A Python Approach to Concepts, Techniques and Applications, Springer, Switzerland.</li> <li>3. Panesar A., (2019). Machine Learning and AI for Healthcare, 1<sup>st</sup> edition, Apress.</li> <li>4. Box GE, Jenkins GM, Reinsel GC, Ljung GM., (2015). Time series analysis: forecasting and control, 5<sup>th</sup> edition, John Wiley &amp; Sons.</li> </ol>	

<b>PHI 4205: Global Health</b>	<b>Credit Hour: 03</b>	<b>Marks: 100</b>
<b>Rationale:</b> Health is becoming a global problem, with NCDs and emerging and re-emerging diseases being the major cause of morbidity and mortality around the globe. Global solidarity and strong unified and coordinated commitment is key approach to handle the pandemicity and health problems related with climate, environment, migration etc. This course is designed to orient the students about the issues and address the burden of public health including research on global health.		
<b>Course Objectives:</b> This course will help the students to – <ol style="list-style-type: none"> <li>1. Understand global health and global health situation</li> <li>2. Differentiate among ‘public health’, ‘international health’, and ‘global health’.</li> <li>3. Describe how certain behaviours, the environment, and other factors contribute to global burden of disease;</li> <li>4. Apply demographic and epidemiological skills in globe, in the investigation, prevention and control of emerging and re-emerging diseases (CDs and NCDs);</li> <li>5. Understand ethical issues in global health study and conflicts management.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<b>A. Introduction:</b> Global health situation and the variations in health status between and within countries; Key issues in global health; Global health indicators; Global health determinants;	1. Understand global health and its importance, global health situation;	

Genesis of global health; Importance of global health study; Critical global health concepts; Global health issues; Disciplines of global health.	
<b>B. Infectious diseases like AIDS, TB and Malaria, emerging diseases and NCDs – a challenge to global health:</b> Important infectious diseases from a global perspective: AIDS, TB and Malaria, Zoonotic Diseases, COVID-19.	2. understand the epidemiology, determinants of AIDS, TB and Malaria, emerging diseases and NCDs; and know the control and prevention strategies and programs of emerging and re-emerging diseases.
<b>C. Globalization and Health:</b> Globalization, urbanization, migration, environmental change and global health; Bioterrorism and security; Global solidarity on vaccine and vaccination; global trade of harmful products- substance abuse.	3. understand the impacts of globalization, urbanization, migration and environmental change on health. .
<b>D. Conflict and global health:</b> Typology of emergencies; the dynamic of emergencies; Different types of conflicts and impact on health; the importance of the local and regional situation regarding social and economic circumstances.	4. Understand different types of conflicts and its impacts on global health.
<b>E. Global health ethics and human rights:</b> Ethics and global health; Ethical Challenges in global health research; Global health governance; Political context of global health policy and advocacy; Global health and human rights.	5. Understand ethics in global health, challenges, policy and advocacy
<b>Recommended Readings:</b>	
1. Michael Seear_ Obidimma Ezezika - An Introduction to Global Health-Canadian Scholars' Press (2018) 2. Kathryn H Jacobsen - Introduction to Global Health-Jones & Bartlett Learning (2014). 3. PMC-Grand Challenges in Global Health.	

<b>PHI 4206: Practical: Data Analysis and Data Management</b>	<b>Credit Hour: 02</b>	<b>Marks: 100</b>
<p><b>Rationale:</b> This course is designed to practice the important algorithms and methods in Statistics and Machine Learning. Students will gain skills in Python/R programming for data cleaning, data visualization, exploratory data analysis, with an overall emphasis on the principles of good data science.</p>		
<p><b>Course Objectives:</b> This course will help the students to –</p> <ol style="list-style-type: none"> <li>1. develop data analysis skills, which can be applied to practical problems;</li> <li>2. write basic computer programs for reading, writing, manipulating, and analyzing health-related data;</li> <li>3. apply statistical and machine learning approaches to analyze health-related data;</li> <li>4. make appropriate classification and clustering technique in modeling the data;</li> <li>5. construct time series model and conduct analysis.</li> </ol>		
<b>Course Content</b>	<b>Intended Learning Outcomes (ILOs)</b>	
	By the end of this course students will be able to –	
<p><b>1. Descriptive Statistics:</b> Data Preparation and visualization, Exploratory Data Analysis, Estimation of different statistics.</p>	<p><b>1.</b> Use appropriate techniques to organize, summarize, and visualize data with interpretation.</p>	
<p><b>2. Matrix Computing:</b> Create matrix, Adding columns and rows, Matrix operations, transpose of a matrix, Calculations of eigen-spectra.</p>	<p><b>2.</b> Create a matrix and different matrix operations.</p>	
<p><b>3. Dimensionality Reduction:</b> Scatterplots, Reduction of a 2D data into 1D, Application of Principal Component Analysis, Independent Component Analysis and Factor Analysis to reduce the dimensionality of the data.</p>	<p><b>3.</b> Reduce the dimensionality of data by PCA, FA and interpret the results.</p>	
<p><b>4. Regression Analysis:</b> Fitting a simple linear regression, Fitting a multiple linear regression model, Logistic regression.</p>	<p><b>4.</b> Fitting a simple and multiple regression equation and interpret the results.</p>	
<p><b>5. Classification:</b> Classification using KNN algorithm, Classification using Naive Bayes, Support vector machine classification.</p>	<p><b>5.</b> Classify new objects to predefined classes by using different classification algorithm.</p>	
<p><b>6. Clustering:</b> Silhouette plot, choosing the appropriate number of cluster using k-means clustering and hierarchical clustering.</p>	<p><b>6.</b> Choose the appropriate number of clusters.</p>	

<b>7. Time Series Analysis:</b> Time series plot, Identifying the AR and MA Parameters, Build an ARIMA Model, Forecasting with ARIMA model.	<b>7.</b> Build an ARIMA model and forecast future values by this model.
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**Recommended Readings:**

1. Dinov, I. V. (2018): Data Science and Predictive Analytics: Biomedical and Health Applications using R, Springer, USA.
2. Igual, L. and Seguí, S. (2017): Introduction to Data Science A Python Approach to Concepts, Techniques and Applications, Springer, Switzerland.
3. Box GE, Jenkins GM, Reinsel GC, Ljung GM., (2015). Time series analysis: forecasting and control: John Wiley & Sons, 5<sup>th</sup> edition.

<b>PHI 4207: Research Project/ Internship</b>	<b>Credit Hour: 03</b>	<b>Marks: 100</b>
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<b>PHI 4208: Viva Voce</b>	<b>Credit Hour: 02</b>	<b>Marks: 100</b>
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