

Maulana Abul Kalam Azad University of Technology, WB
(Formerly known as West Bengal University of Technology)
Syllabus of B.Sc. in Medical Instrumentation & Critical Care Technology
Effective from academic session 2023-24

7th SEMESTER (With Honors)

Sl.	Subject Type	Code	Subject Name	Credits			Total Credits
				L	T	P	
2.	DSC	BMICCT 701	COMMUNITY HEALTH & EVS	3	2	0	5
3.		BMICCT 702	RESEARCH METHODOLOGY - II	4	1	0	5
4.	DSE	MIM701	Consumer Behavior	4	-	0	4
5.		MIM702	Strategic Management	4	-	0	4
6	SEC	SEC 781	Dissertation Work [Evaluation in Eight Semester]	-	-	-	0
7		SEC 782	Summer Internship (refer Appendix – 1A)	-	-	-	4
Total Credit							22

Course Name: COMMUNITY HEALTH & EVS

Mode: Offline

Credits: 5 (3L+2T)

BMICCT 701

Aim of the course:

The aim of this course is to provide students of the Critical Care Department with a comprehensive understanding of the social, environmental, and systemic factors that influence individual and community health. It seeks to develop their ability to apply public health principles, promote environmental sustainability, and contribute effectively to preventive healthcare and emergency response within the community setting.

Course Objective:

- To recognize the various determinants of health and their impact on population well-being.
- To evaluate the role of environmental sustainability in disease prevention and health promotion.
- To understand the public health role of critical care technologists in emergencies, disease outbreaks, and disaster management.

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Sr no.	Graduate attributes	Mapped Modules
CO 1	Introduction to Community Health and Health Determinants	MODULE I
CO 2	Environmental Health and Sustainability	MODULE II
CO 3	Health Care Delivery System in India	MODULE III
CO 4	Occupational and Lifestyle Health in Community Setting	MODULE IV

Learning objectives:

- To provide foundational knowledge about the concepts of community and public health.
- To understand the environmental factors affecting human health and promote sustainable practices.
- To equip students with knowledge about the structure and function of healthcare services and programs.

Module Number	Content	Total Hours	% of questions	Bloom Level (applicable)	Remarks, if any
THEORY					
M I	Introduction to Community Health and Health Determinants	12	25		NA
M II	Environmental Health and Sustainability	12	25		NA
M III	Health Care Delivery System in India	11	25		NA
M IV	Occupational and Lifestyle Health in Community Setting	10	25		NA
Total Theory		45	100		
TUTORIAL		30			
TOTAL		75			

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Detailed Syllabus:

MODULE I: Introduction to Community Health and Health Determinants

- 1. Understanding Health and Disease in a Community Context**
 - Definitions: Health, Public Health, Community Health
 - Natural history of disease
- 2. Types of Communities and Their Health Profiles**
 - Rural, urban, tribal communities
 - Cultural and social health practices
- 3. Determinants of Health: A Multidimensional Perspective**
 - Social, economic, genetic, environmental, and behavioral determinants
 - Health indicators and indices (IMR, MMR, DALY, etc.)
- 4. Role of Family and Community in Health Promotion**
 - Community-based health practices and beliefs
 - Role of caregivers and volunteers

MODULE II: Environmental Health and Sustainability

- 1. Introduction to Environmental Studies and Public Health**
 - Definition and scope of EVS
 - Interconnection of environment and health
- 2. Air, Water, and Soil Pollution: Impact on Health**
 - Sources, types, and prevention strategies
 - Pollution-related respiratory and cardiovascular issues
- 3. Waste Management in Health Care Settings**
 - Biomedical waste classification and disposal
 - Infection control measures
- 4. Climate Change, Global Warming & Disaster Health Management**

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- Heat waves, floods, and vector-borne diseases
- Critical care response in environmental emergencies

MODULE III: Health Care Delivery System in India

1. Overview of National Health Care System

- Public vs. private sectors
- Levels of healthcare: Primary, Secondary, Tertiary

2. Primary Health Care and Its Principles

- Accessibility, equity, community participation, appropriate technology
- Role of ASHA, ANM, PHCs

3. National Health Programs and Campaigns

- National Tuberculosis Elimination Program (NTEP)
- National Immunization Schedule
- Vector Control Programs

4. Health Education and Promotion Strategies

- IEC (Information, Education, and Communication)
- Behavioral change models in public health

MODULE IV: Occupational and Lifestyle Health in Community Setting

1. Occupational Health: Hazards and Prevention

- Chemical, physical, biological hazards in community and hospitals
- Safety regulations and protocols

2. Lifestyle Disorders and Community Interventions

- Diabetes, hypertension, obesity, substance abuse
- Preventive strategies and awareness

3. Epidemiology and Surveillance of Communicable Diseases

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- Epidemiological triad, chain of infection
- Outbreak investigation basics

4. Critical Care Technologist's Role in Community Health

- Community emergency response and triage
- Public health responsibilities in pandemics (COVID-19 as case study)

Suggested Books:

- Park's Textbook of Preventive and Social Medicine
- Environmental Studies by Erach Bharucha
- National Health Mission Reports & WHO Guidelines

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Course Name: RESEARCH METHODOLOGY - II

Mode: Offline

Credits: 4 (3L+1T)

BMICCT 702

Aim of the course:

The aim of this course is to provide students with a foundational understanding of research principles and methodologies. It equips them with the essential skills to design, conduct, analyze, and interpret research in a systematic and ethical manner.

Course Objective:

- To understand the fundamental concepts and significance of research in academic and professional contexts.
- To develop the ability to identify research problems and formulate appropriate research questions and hypotheses.
- To gain knowledge of various research designs, methods, and techniques applicable to different types of research studies.
- To acquire skills in data collection, sampling methods, and the use of tools and techniques for data analysis.

Sr no.	Graduate attributes	Mapped Modules
CO 1	Advanced Research Design and Planning	MODULE I
CO 2	Data Collection Tools and Techniques	MODULE II
CO 3	Data Management and Statistical Analysis	MODULE III
CO 4	Research Reporting and Dissemination	MODULE IV

Learning objectives:

- Understand the Fundamentals of Research
- Identify and articulate a clear research problem.
- Comprehend the concept of research design and its importance.
- Learn how to conduct an effective literature review.

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Module Number	Content	Total Hours	% of questions	Bloom Level (applicable)	Remarks, if any
THEORY					
M I	Advanced Research Design and Planning	12	25		NA
M II	Data Collection Tools and Techniques	11	25		NA
M III	Data Management and Statistical Analysis	11	25		NA
M IV	Research Reporting and Dissemination	11	25		NA
Total Theory		45	100		
TUTORIAL		15			
TOTAL		60			

Detailed syllabus:

MODULE I: Advanced Research Design and Planning

- Overview of Quantitative, Qualitative, and Mixed Methods Research
- Experimental and Quasi-experimental Designs in Critical Care Studies
- Sampling Techniques: Probability and Non-Probability Sampling
- Ethical Considerations and Approval Processes in Clinical Research

MODULE II: Data Collection Tools and Techniques

- Designing Structured and Semi-Structured Questionnaires
- Validity and Reliability of Research Instruments

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- Use of Observation and Interview Methods in Critical Care Research
- Technological Tools for Data Collection: Electronic Health Records and Monitoring Devices

MODULE III: Data Management and Statistical Analysis

- Data Coding, Entry, and Cleaning Procedures
- Descriptive and Inferential Statistics Relevant to Critical Care Research
- Introduction to Statistical Software (SPSS, R, or equivalent)
- Interpretation of Results and Data Visualization Techniques

MODULE IV: Research Reporting and Dissemination

- Writing Research Proposals and Protocols
- Structuring Scientific Research Papers: IMRAD Format
- Referencing Styles and Avoiding Plagiarism
- Presentation Skills: Posters, Oral Presentations, and Publishing in Journals

Suggested Books:

- **Research Methodology: Methods and Techniques** by C.R. Kothari and Gaurav Garg
- **Research Design: Qualitative, Quantitative, and Mixed Methods Approaches** by John W. Creswell
- **Qualitative Inquiry and Research Design: Choosing Among Five Approaches** by John W. Creswell

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6	SEC	SEC 781	Research Internship Report and Viva (refer Appendix 1B)	-	-	-	4
Total Credit							22

Course Name: COMMUNITY HEALTH & EVS

Mode: Offline

Credits: 5 (3L+2T)

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Course Name: ADVANCED RESEARCH METHODOLOGY

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Sr no.	Graduate attributes	Mapped Modules
CO 1	Research Foundations	MODULE I
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Learning objectives:

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M IV	Data Analysis and Research Reporting	11	25		NA
Total Theory		45	100		
TUTORIAL		15			
TOTAL		60			

Detailed syllabus:

MODULE I: Research Foundations

Meaning, nature, and scope of research

Types of research: basic, applied, exploratory, descriptive, analytical

Quantitative, qualitative, and mixed methods

Inductive and deductive reasoning

Research problem identification

Research objectives, questions, and hypotheses

Variables and conceptual framework

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MODULE II: Research Design and Sampling

Research design: meaning and types
Exploratory, descriptive, experimental, and causal designs
Cross-sectional and longitudinal studies
Population and sample
Probability and non-probability sampling techniques
Sample size and sampling errors

MODULE III: Data Collection and Measurement

Sources of data: primary and secondary
Methods of data collection: questionnaire, interview, observation
Scaling techniques and measurement
Validity and reliability
Pilot study
Ethical issues in data collection

MODULE IV: Data Analysis and Research Reporting

Data processing and analysis
Descriptive statistics and basic inferential statistics
Introduction to SPSS / Excel
Interpretation of results
Research report structure
Referencing styles and plagiarism
Presentation of findings

Suggested Books

Kothari, C.R.; Creswell, J.W.; Saunders et al.; Sekaran & Bougie