NATIONAL POSTGRADUATE MEDICAL COLLEGE OF NIGERIA

# POSTGRADUATE DIPLOMA CURRICULUM FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH

## FACULTY OF PUBLIC HEALTH AND COMMUNITY MEDICINE

APPROVED BY THE SENATE ON 1ST DECEMBER, 2022

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COLLEGE REGISTRAR

**FACULTY OF PUBLIC HEALTH AND COMMUNITY MEDICINE**

**NATIONAL POSTGRADUATE MEDICAL COLLEGE OF NIGERIA**

**(NPMCN)**

# TRAINING CURRICULUM

**FOR POSTGRADUATE DIPLOMA**

**IN**

# OCCUPATIONAL AND ENVIRONMENTAL HEALTH

**2022**

**TABLE OF CONTENTS** **Page**

**1.0 INTRODUCTION:** The National Postgraduate Medical College of Nigeria (NPMCN) was established by the National Postgraduate Medical College Decree No. 67 of 24th September, 1979, now Cap N59 Laws of the Federation 2004. The Faculty of Public Health and Community Medicine, one of the faculties under the National Postgraduate Medical College is responsible for training of specialist public health physicians in Nigeria with skills and competences to practice public health in Nigeria and beyond. Such training has often required very rigorous procedures and involving Primary, Part 1 and Part 2 examinations and spanning a period of at least six years. Since then the College has trained many doctors in the field of public health. Despite this laudable effort there still remains a need for more manpower specialists in public health to take care of the ever challenging health issues in Nigeria.

The NPMCN has encouraged establishment of a postgraduate diploma program in Faculty of Public Health and Community Medicine (FPHCM) to fill-in this manpower gap and also provide knowledge and competences in certain subspecialties of public health to doctors in other specialties of medical practice. Therefore, this curriculum is a guide to the training of these doctors in basic Occupational and Environmental Health (OEH) subspecialty of Public Health and Community Medicine (PHCM).

**1.1 MISSION STATEMENT:** The mission of the Faculty of Public Health and Community Medicine is to promote the highest level of academic and professional training of doctors in Public Health and Community Medicine in line with the best global standards.

1.2 VISION: To develop human resource for health that meets international standards utilizing global best training standard in the subspecialty of Occupational and Environmental Health

**1.3 EDUCATIONAL OBJECTIVES OF THE FACULTY OF PUBLIC HEALTH AND COMMUNITY MEDICINE**

The educational objectives are to:

i. Strengthen accredited training institutions to ensure that the trainees are exposed to the best academic and professional training.
ii. Ensure and maintain highest standards for learning and practice of Public Health and Community Medicine for continued academic development.

iii. Evaluate and certify trainees using phased, reliable and valid assessment methods.

iv. Promote academic excellence and professionalism through the inculcation of attitudes of honesty and accountability, with sincerity and precision in academic and professional thoughts, words and actions.

**1.4 GOAL OF THE PROGRAM**: To provide middle level manpower that will have the knowledge and skill to identify, investigate and solve common health and safety problems encountered in the environment and workplaces.

**1.5 TRAINING PHILOSOPHY:** Occupational Health and Environmental Health are interlinked with one affecting the other. It is therefore difficult to study or control for one without the other. This linkage will be highlighted during the program. Occupational Health focuses on the prevention and management of diseases acquired in the workplace. Hence it examines the physical, biological, chemical, ergonomic, mechanical and psycho-social hazards that are encountered in the workplace. These hazards also exist in the general environment. Environmental health includes the following: waste disposal, housing, climate change issues, food hygiene, etc.

This training program is expected to produce doctors with moderate level of knowledge and skill to identify and control for occupational and environmental hazards. Trainee is expected to apply these both in the workplace and general environment to tackle issues as they arise.

**1.6 GENERAL OBJECTIVES:** To produce manpower with the knowledge and skill to prevent and manage common occupational and environmental health and safety issues and provide a healthier workforce and environment.

**1.7 SPECIFIC OBJECTIVES**

i. To be able to identify and control common occupational and environmental health hazards

ii. To be able to carry out environmental monitoring of dust, sound, temperature and radiation



iii. To develop the knowledge and skill required to design and carry out research activities

iv. To demonstrate leadership and team-player skills in addressing occupational and environmental health problems

v. To develop the knowledge and skill required to carry out environmental impact assessment

vi. To conduct hazard identification, risk assessment and the promotion and implementation of appropriate interventions.
vii. To collect, generate, synthesize, appraise, analyze, interpret and communicate epidemiologic intelligence that measures the health status, risks, needs and health outcomes of defined populations.

**2.0 SCOPE OF CURRICULUM:** This curriculum explains the entire training requirement for obtaining a diploma degree in OEH. This program is domiciled in the Faculty of Public Health and Community Medicine and the trainers are also from this Faculty. Areas covered include the entry requirement, duration of training, the course content, and credit units. Also indicated are the assessment methods.

**3.0 ADMISSION REQUIREMENTS:** To be eligible for admission into the program, the candidate must have met the following conditions

i. Have MBBS or BDS degree
ii. Full registration with MDCN
iii. Pass the examination/aptitude test designed to screen candidates for such purpose

**4.0 TRAINING GUIDELINE:**

**4.1 STUDY PERIOD**: Minimum of 12 Months of two semesters (each semester lasts for 15 weeks)

**4.2 STUDY MODE**: Part time program. It will be hybrid involving online lectures, seminars, physical postings and field experiences.

**4.3 TRAINING METHOD AND CONTACT HOURS**: Virtual Lectures of 8-10hrs per week

**5.0 COURSES CONTENT**: In the first semester each student is required to complete 6 compulsory courses, a seminar presentation on occupational health and one elective. In the second semester each student is required to complete five compulsory courses, a seminar presentation on environmental health and one elective. There will also be project report and presentation.

| Course Code | Course title | Credit Unit | Weighting (%) of Course coverage |
|---|---|---|---|
| **1st Semester** | | | |
| OEH 811 | Introduction to Epidemiology | 2 | 5 |
| OEH 812 | Introduction to Medical Statistics | 2 | 5 |
| OEH 813 | Introduction to Occupational Health and Safety | 3 | 10 |
| OEH 814 | Introduction to Environmental Health and safety | 3 | 10 |
| OEH 815 | Research Methodology and Application of ICT in Research | 2 | 10 |
| OEH 816 | Hazard Evaluation and Communication in Health | 2 | 10 |
| OEH 817 | Social Medicine (elective) | 2 | 10 |
| OEH 818 | Health Education (elective) | 2 | 10 |
| OEH 819 | Field work and Seminar presentation on Occupational health topic | 2 | 30 |
| | **Total** | **20 units** | |
| **2nd Semester** | | | |
| OEH 821 | Climate and Human health | 2 | 10 |
| OEH 822 | Occupational Medical Examinations and Surveillance | 2 | 10 |
| OEH 823 | Common occupational diseases: lung and skin diseases, cancers | 2 | 10 |
| OEH 824 | Safety management principles and practice | 2 | 10 |
| OEH 825 | Basic Occupational and Environmental Monitoring | 2 | 10 |
| OEH 826 | Primary Health care (elective) | 2 | 10 |
| OEH 827 | Global Health (elective) | 2 | 10 |
| OEH 828 | Field work and Seminar on Environmental Health topic | 2 | 30 |
| OEH 829 | Project Report and Presentation | 6 | |
| | **Total** | **22 units** | |
| | **Grand Total** | **42 Units** | |

## 6.0 COURSE DESCRIPTION

**6.1 INTRODUCTION TO EPIDEMIOLOGY (2 UNITS):** Definitions and principles of epidemiology; Non-communicable and communicable disease epidemiology; measures of disease frequency; measures of association; epidemiologic study designs (observational and intervention);

basic principles of epidemiologic research design; types of research questions, analysis of epidemiologic studies; disease investigation; disaster management; application of epidemiologic principles in occupational and environmental health

**i. Learning objectives**: At the end of the course the student should be able to

- discuss communicable and non-communicable disease epidemiology
- identify various epidemiological study designs
- describe disease investigation
- define disaster and explain steps involved in disaster management.

**ii. Expected Competencies**

- Apply the principles of epidemiology in disease control
- Design, conduct and analyze research
- Conduct disaster management

**iii. Trainers**

- Public Health Physician (Epidemiologist)

**6.2 INTRODUCTION TO MEDICAL STATISTICS (2 UNITS):** Descriptive and inferential statistics. Application of statistical techniques that are commonly used in medical research: data types, measures of central tendency and variability, test of hypotheses; probability distributions, test of significance, confidence intervals, sample; size calculation and power, measures of association, non- parametric analyses, analysis of variance and the basics of linear regression, use of SPSS.

**i. Learning objectives**: At the end of the course the student should be able to

- Explain descriptive and inferential statistics
- Analyze data using appropriate tool
- Apply correlation and regression where appropriate

**ii. Expected Competencies**

- Data analysis
- Application of hypothesis testing
- Use of SPSS, EPI Info and Excel for data entry and analysis

**iii. Trainers**

- Public Health Physician (Biostatistician)

**6.3 RESEARCH METHODOLOGY AND APPLICATION OF ICT IN RESEARCH (2 UNITS):** Major steps in research: problem identification, literature review, study design, data collection, analysis and interpretation, discussion and conclusions; Types of referencing styles; Study of various research designs, retrospective; case studies, surveys, descriptive, analytical, cross-sectional, cohort, experimental, etc. Identification of research problems and development of research questions and/or hypothesis; detailed aspects of study materials and methods (research tools, study design, study area and population, sample size estimation, sampling methods, study limitations and inclusion criteria), research ethics. Data analysis and results presentation in different discipline using appropriate analytical tones; Methods of project/ project report writing; Application of appropriate ICT tools relevant for data gathering, analysis and results presentation. Essentials of spread sheet, internet technology and internal search engines

**i. Learning objectives**: At the end of the course the student should be able to

- Develop research topic and plan
- Analyze research data
- Interpret research findings

**ii. Expected Competencies**

- Research formulation
- ICT application in research

**iii. Trainers**

- Public Health Physician (Epidemiologist)

**6.4 INTRODUCTION TO OCCUPATIONAL HEALTH AND SAFETY (3 UNITS)**: History of Occupational Health; Organization and functions of Occupational health, The work environment; Key Principles in Occupational safety and health; Principles of control/prevention of occupational diseases and hazards; Occupational legislation (factory law, labour law, Employee Compensation Law); Occupational hazard risk assessment; Application of concept of epidemiology in management of workplace diseases; Sickness Absence; Assessment of Fitness for Return to Work;

**i. Learning objectives**: At the end of the course the student should be able to

- List the functions of occupational health staff
- Explain the principles of control of occupational hazards
- Apply the principles of epidemiology in management of occupational hazards

- Discuss sickness absence
- Discuss the industrial legislations
- List the key principles of occupational safety and health

**ii. Expected Competencies**

- Control of workplace hazards
- Conduct a hazard risk assessment

**iii. Trainers**

- Public Health Physician (Epidemiologist)

**6.5 INTRODUCTION TO ENVIRONMENTAL HEALTH AND SAFETY (2 UNITS):** Definition and classification of environment; Environmental hazards; relationship between health and environment; Water supply and health; Refuse collection and disposal; Sewage disposal and sewerage system; Housing and health; Food hygiene and Safety; Air pollution and control; Noise pollution and control; Vector control; Environmental Impact Assessment; Disaster Management.

**i. Learning objectives**: At the end of the course the student should be able to

- Explain disasters and disaster management
- Discuss environmental impact assessment
- List different aspects of environment and associated health effects
- Discuss control measures of environmental hazards

**ii. Expected Competencies**

- Take part in disaster management
- Take part in environmental impact assessment

**iii. Trainers**

- Public Health Physician (Epidemiologist)

**6.6 HAZARD EVALUATION (2 UNITS):** Definition and classification of hazards; Anticipation, recognition, evaluation, and control of workplace hazards in order to maintain a healthy and safe work environment; The Concept of Ergonomics, and ergonomic hazards and management, Evaluation and control of hazards, The Guidelines for hazard evaluation procedures, Hazard Evaluation Techniques; Bowtie concept of hazard analysis. Swiss cheese safety model.

**i. Learning objectives**: At the end of the course the student should be able to

- Explain the hazard analysis models

- Define ergonomics and apply it in work situations
- Discuss guidelines for hazard evaluation

**ii. Expected Competencies**

- Discuss various hazard causation models

**iii. Trainers**

- Public Health Physician (Epidemiologist)

**6.7 CLIMATE AND HUMAN HEALTH (2 UNITS):** Introduction to concepts, Vulnerability of population to climate change, Methods to assessing Health Impact, Overview of key impacts related to climate change (extreme weather events, disasters, vector-borne infectious diseases, food security, water, urban health quality, social disruption), Adaptation to climate change and variability (Measures to enhance adaptive capacity, Global and Nigerian Situation; Global warming; Greenhouse Effects; Carbon footprint; UN Climate Change Conferences (e.g. COP26).

**i. Learning objectives**: At the end of the course the student should be able to

- Assess the link between climate and human health
- Explain effect of human activities on climate
- Suggest ways to reduce carbon footprint

**ii. Expected Competencies**

- Discussing interaction between man and climate

**iii. Trainers**

- Public Health Physician (Public Health physician: Environmental Heath subspecialty)

**6.8 SAFETY MANAGEMENT PRINCIPLES AND PRACTICE (2 UNITS)**: History of safety management practices; The philosophy of safety; General Principles of Effective Health and Safety Management; Hazard identification, Incident investigations and reporting, Safety reporting, Basic safety training, safety propagation, Compiling basic safety system standards and criteria, Safety processes, Basic risk analysis, Basic management reporting.

**i. Learning objectives**: At the end of the course the student should be able to

- Design safety management policy
- Explain hazard identification
- Discuss incident investigation and reporting

**ii. Expected Competencies**

- Plan an incident investigation and reporting

**iii. Trainers**

- Public Health Physician (Occupational Health physician)

**6.9 GLOBAL HEALTH: DEFINITION OF GLOBAL HEALTH;** Origins and development of global health, Global Disease Burden, Global Health regulations and legislation, concepts in global health policy and practice, public health emergencies of international concern; WHO constitution, structure scope & Functions, Port health services, Disaster management in public health; Environmental Health in Emergencies, Environmental health laws in Nigeria and International; International Labour Organization, Occupational health laws in ILO and Nigeria.

**i. Learning objectives**: At the end of the course the student should be able to

- Discuss the roles of WHO & ILO in global health
- Appraise global disease burden
- Identify public health emergencies of international concern

ii. **Expected Competencies**

- Develop public health emergency plan

**iii. Trainers**

- Public Health Physician (Epidemiologist)

**6.10 SOCIAL MEDICINE**: Definition of Social Medicine; Concepts of culture, society; social stratification and health outcomes; Medical anthropology in public health; Sociological approaches to health, Theories of diseases causation & effect on perception of health and illness, Illness behavior/Sick role, Modern and traditional health systems Social Determinants of Health, Social and psychological aspects of health in work place environments, Social welfare services in Nigeria.

**i. Learning objectives**: At the end of the course the student should be able to

- Explain the illness behavior
- Discuss relationship to social factors and health

**ii. Expected Competencies**

- Recognized the interaction between social factors and health

**iii. Trainers**

- Public Health Physician (Medical Sociologist/Public Health Physician)

**6.11 PRIMARY HEALTH CARE:** The history of Primary Health Care system in Nigeria; The Alma Ata Declaration, Principles & Components of PHC, Old and New PHC Implementation & Organizational Structure in Nigeria, PHC Planning and Management, Community diagnosis and Mobilization for Action, PHC related Global Health Programs, Bamako initiative, Monitoring and Evaluation of PHC activities, Developing PHC programs, Medical Officer of Health. Challenges of PHC services in Nigeria

**i. Learning objectives**: At the end of the course the student should be able to

- Define PHC and List the Principles of PHC
- Explain the organizational structure of PHC
- List the functions of PHC

**ii. Expected Competencies**

- Perform functions of Medical Officer of Health

**iii. Trainers**

- Public Health Physician (Epidemiologist)

**6.12 HEALTH EDUCATION AND COMMUNICATION IN HEALTH (2 UNITS):** Definitions of health education and communication in health, concepts, principles and objectives of health education, Education theories and the learning process, Types of communication; medium of communication; Role of communication in health; Identification of learning needs, Education and training methodology including the IEC training scheme, Planning of health education for individuals, groups and communities, Levels of health education.

**i. Learning objectives**: At the end of the course the student should be able to

- Define health education and communication
- Develop communication skills
- Plan health education for specific groups and condition

**ii. Expected Competencies**

- Communication skills
- Health education on specific/general health conditions

**iii. Trainers**

- Public Health Physician (Public health specialist/Health education and communication subspecialty)

**6.13. COMMON OCCUPATIONAL HEALTH DISEASES:** Diseases of the lungs, Skin and Cancers. & Diseases of some occupations like farmers, lead workers, health workers: Acute lung diseases; chronic lung diseases like pneumoconiosis; occupational dermatitis; occupational cancers and occupational carcinogens; cancer testing.

**i. Learning objectives**: At the end of the course the student should be able to

- Identify common occupational health disorders
- Develop control measures

**ii. Expected Competencies**

- Management of common occupational health disorders

**iii. Trainers**

- Public Health Physician (Epidemiologist)

**6.14. BASIC OCCUPATIONAL AND ENVIRONMENTAL MONITORING (2 UNITS):** Objectives of monitoring in Occupational and Environmental health; Methods of monitoring (air, water, soil, body fluids); Tools used in monitoring; Noise, Radiation; Chemicals, etc.

**i. Learning objectives**: At the end of the course the student should be able to

- Identify conditions at risk of releasing hazards to environment
- Use the required tools in monitoring for hazards
- Interpret findings and suggest control measures

**ii. Expected Competencies**

- Use of monitoring tools like audiometer, dust sampler, spirometer

**iii. Trainers**

- Public Health Physician (toxicologist/occupational and environment health specialists)

**7.0 FIELD WORK AND SEMINAR PRESENTATIONS (2 UNITS EACH):** Field work will be carried out during the first and second semesters. Each will be for duration of one week in approved training centers. The occupational health posting will be done in either an industry or teaching hospital that has occupational health unit. It will be under the supervision of an occupational health specialist. Formative assessment will be done using log book. At the end of this posting a detailed report on the posting will be presented. There will also be seminar presentation on any occupational health topic of public health interest.

The environmental health posting will be done in the State or Federal Ministry of Environment. This will be under the supervision of a specialist in environmental health. Formative assessment will be done using log book. At the end of this posting a detailed report on the posting will be presented. There will also be seminar presentation on any environmental health topic of public health interest. The seminars will involve detailed/critical literature review of topical health issues. The student will be supervised by one of the assigned lecturers who will be a Fellow of the College.

**8.0 PROJECT REPORT AND PRESENTATION (6 UNITS):** Project topics and supervisor will be assigned to candidates in the first semester and research commenced as soon as possible after approval by relevant authorities like Ethics Committee and the Faculty. The project presentation will be done at the end of the session provided the candidate has passed the entire course work and paid all the necessary dues.

**8.1 PROJECT: OEH 829**

In addition to passing the assessment at the end of each online module, trainees must complete a project for the award of postgraduate Diploma in OEH.

The project may include:

- Operation Research work
- Secondary data or a Review research in OEH of public health

The project shall have the following format and structure.

**Title page:** The title is to be written as **"Project for Final Examination."** This is then followed by the name of the candidate, his/her training institution's address; followed by statement: **"submitted to the Faculty of Public Health and Community Medicine, in partial fulfillment of the requirements for the award of postgraduate diploma in Occupational and Environmental Health in Faculty of Public Health and Community Medicine, of the National Postgraduate Medical College of Nigeria".** Finally, the month and year of the examination at which the book is presented, for example "November 2022".

The student project shall consist of the following opening pages and chapters:

**Certification page (***Should contain Name, Signature, Date and Address of Supervisor)*

**Dedication (optional)**

**Acknowledgements (optional)**

**Table of contents**

**Chapter One - Introduction**

**Chapter Two - Literature Review**

**Chapter Three - Methodology**

**Chapter Four - Results/Findings**

**Chapter Five - Discussion, Conclusions and Recommendations**

iv. The conclusions and recommendations for all stakeholders including the faculty, the training institution, the department, as well as, for colleagues and future diplomats

**References**: Referencing style should be Harvard applying Vancouver Referencing in the text and listing the references at the end of the report.

**9.0 EVALUATION/ASSESSMENT:** Evaluation and assessment will be Formative and Summative. The Formative assessment will be done at the end of each course and will make up of 30% of total score.

The Summative assessment will be done at the end of the Course and will make up of 70% of the total score..

- **General Areas of Assessment:** When assessing students, skills and competencies to be assessed include ability to:
    - identify common environmental and occupational hazards and control measures
    - carry out hazard – risk assessment and environmental impact assessment
    - conduct hazard monitoring and evaluation using appropriate tools and procedures
    - use principles of epidemiology to solve occupational and environmental health concerns
    - carry out research activities that will positively impact on workplace and general environment.

  Specific objectives are listed within each course.

**9.1 OUTCOME ASSESSMENT:** Components of outcome assessment shall include ability to:

- critically appraise the state of current knowledge with respect to important OEH issues;
- demonstrate good analytical skills;
- demonstrate an appropriate level of professional knowledge;

- make environmental and workplace health-related decisions in a rational way and solve problems effectively;
- communicate effectively using written and oral methods;
- ability to provide occupational health service
- ability to perform environmental monitoring and conduct mitigation activities

**9.2 EXAMINATION:** A minimum of 75% attendance of all registered courses and compulsory activities is required before a student is allowed to participate in examinations. Courses will be examined at the end of the semester in which they were registered, while assessment of the Project Report will be at the end of the programme. Each exam will be in two parts: a continuous assessment test (formative assessment) which forms 30% of the final score and a main exam (summative assessment) which will form 70% of the final score. Students that fail to meet attendance requirements and those that fail to attend an examination or seminar presentation without an official permission by the Faculty shall be considered to have failed the exam and will be due to repeat the examination.

Final Examination Format

| **Components** | **Assessment type** | **How will it be assessed** | **Resources** | **Time** |
|---|---|---|---|---|
| **Theory** | **MCQ** | **Standard Setting Method (Angoff)** | CBT | 60 minutes |
| **Project defense/ Orals** | Candidate will be examined on theory and Practice of Epidemiology and Biostatistics | 60% on Principles and practice of OEH and 40% defense of Field Posting Report | Examiners | 30 minutes 60 minutes |

**9.3 ASSESSMENT SCORING AND GRADING OF PERFORMANCE**

Scoring of the different components of the assessment shall be as follows:

| Scores | Level of Pass | Grade | Grade Level |
|---|---|---|---|

| | | | |
|---|---|---|---|
| ≥ 70 | Very Good Pass | A | P+1 |
| 60 – 69 | Good Pass | B | P+ |
| 50 – 59 | Pass | C | P |
| 40 – 49 | Borderline | D | P - |
| < 39 | Fail | E | P -1 |

**9.4 AWARDING THE POSTGRADUATE DIPLOMA DEGREE**

Any student whose CGPA falls below 2.50 in any semester shall withdraw from the programme. Students must complete the course work before being allowed to defend project. Any student who fails to complete course work and defend project within the stipulated maximum period of stay (18 months) will be considered to have abandoned the programme.