

# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR DIPLOMA IN OCCUPATIONAL HEALTH**

## **Preamble:**

The health of a nation is directly associated with the different developmental activities particularly industrial activities involving a huge manpower and occupational health covers wide areas of organized and unorganized sectors. Since the industrial sector is using newer techniques, the health of the workforce and community needs to be monitored constantly by properly trained medical specialists who are trained in monitoring occupational health hazards. But, the availability of trained medical manpower, suitable for providing health care to the industrial sectors is inadequate. **The facilities of imparting training in Occupational and environmental health to medical graduates are very limited in the Indian context, the available curriculum needs a thorough revision incorporating newer developments in the field and its applicability to the industrial sector.** The competency based post graduate training programme in Occupational health would fulfil this need for a post graduate medical curriculum which would address this issue.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

## ***PROGRAMME OBJECTIVES***

The **goal** of the Diploma training programme in Occupational Health is:

- **To train groups of medical personnel in Occupational and/or Environmental Health issues.**
- To identify/recognise Occupational and/or Environmental Health related problems, undertake investigations and formulate remedial/control measures.
- To produce leaders in the speciality capable of undertaking research and development programmes for the industry and the community;
- To provide regular update about recent advances in the field.
- To create skilled medical manpower in the area of Occupational Health management, to undertake awareness programmes for betterment and upliftment of health and well being of the community in general and industrial workers in particular.

## ***SPECIFIC LEARNING LEARNING OBJECTIVES***

**The Diploma course in Occupational and Environmental Health** is to produce a competent medical professional who will be able to:

- apply the skills of a specialist medical practitioner to:
  - diagnose and manage disease and injury in relation to occupation
  - determine the relationship between health and fitness to work
  - advise on the effect of major contemporary health issues in workplaces
- conduct workplace and preliminary environmental assessments in order to recognise, evaluate and control physical, chemical, biological, design-related and psychosocial hazards
- retrieve, critically appraise and disseminate occupational and environmental health and safety information in readily understandable terms
- apply management skills in order to:
  - coordinate and manage occupational and environmental health and safety programs, including health surveillance
  - effect relevant change in workplaces
  - negotiate and resolve conflict relating to occupational and environmental health and safety issues
- communicate effectively in order to secure the cooperation of management, employees and colleagues in the provision of a safe and healthy workplace
- be an advocate for health in workplaces and the broader community
- interpret the legislative, regulatory, and medico-legal aspects of occupational and environmental health and safety and be able to apply these in practice
- design, implement and manage a vocational rehabilitation program in the workplace
- provide on-hand practical training to recognise health problems related to occupation, confirm the diagnosis and suggest remedial measures
- assess the factors responsible for the causation of the health problems in working and general environment conditions
- advise on the human effects of factors in workplaces and other environments that are physical, chemical, biological, psychosocial and mechanical
- design, conduct, implement and evaluate preventive strategies in workplaces
- impart training in systematic collection of information, compilation and presentation of data, storage, record keeping and retrieval of data in respect of each worker.
- participate in continuing professional development in order to respond to changes in workplaces and keep abreast of the latest developments on occupational and environmental medicine, and health and safety issues
- recognise the limits of individual knowledge and seek advice from experts
- impart practical knowledge in computer application and drawing valid conclusions by applying appropriate statistical methodology.
- develop basic skills in public relations, health education and public awareness programme through effective communication and information technology.

- train the workers in occupational safety and various legislations enacted from time to time in this regard.
- establish cause and effect relationship of industrial accidents and health issues of workers, if possible.
- develop interventional programme for occupational safety.
- To provide training in Occupational/Environmental Health for undergraduate and post graduate students.
- facilitate the compliance of existing statutory provisions under (a) Indian Factories Act, 1948 as amended up to date, (b) ESI Act, (c) Workmen Compensation Act etc.
- create skilled manpower to take care of research and development in relevant issue as applicable from time to time.

### ***SUBJECT SPECIFIC COMPETENCIES***

**At the end of the course, the student should have acquired knowledge in the following:**

#### **A. Cognitive Domain**

1. Basic knowledge on the structure of the different organ systems of human body, their functions and response to pathological conditions.
2. Applied aspects of Occupational and Environmental Health.
3. Occupational / Environmental Health Epidemiology.
4. Occupational / Environmental Health disorders and diseases.
5. Biochemical, microbiological, and toxicological aspects of Occupational / Environmental exposures.
6. Work physiology – Ergonomics, Biomechanics and stressors.
7. Environmental Sanitation and Maternal & Child Health.
8. Legislation related to Occupational health.
9. Occupational health, diseases and safety.

#### **B. Affective Domain:**

1. The student should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. The student should always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. The student should develop communication skills to prepare reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

#### **C. Psychomotor domain**

**At the end of the course, the student should acquire the following clinical skills and be able to:**

**A. Practical and Clinical Training**

- a. Medical examination - proficiency in collection of proper occupational exposure history, general examination, recognition and demonstration of physical finding, pre-employment, pre-placement, periodic and special examination.
- b. Diagnosis of occupational diseases including special, sophisticated and specific investigations.
- c. Therapeutic and management skills

**B. Occupational / Environmental Hygiene**

- a. Assessment of personal work exposure → Sampling, analytical techniques and their interpretation.
- b. Assessment of working and general environment (dust, noise, illumination, heat, humidity, air movement etc.) → Sampling, analytical techniques and their interpretation.
- c. Biological monitoring → Collection of samples, analysis and interpretation.
- d. Chemical analysis of other environmental & biological samples including estimation of free silica and other pollutants.

**C. Respiratory Physiology - Pulmonary Function Tests**

- a. Measurement of different pulmonary function tests, calculation of other parameters from the tracings and their interpretation including assessment of different types of impairments.
- b. Use of aerosols and calculation of reversibility following standard criteria.
- c. Blood Gas analysis.

**D. Radio-imaging techniques**

- a. X-ray of chest as per ILO specification for Pneumoconiosis and other radiological investigations.
- b. X-ray interpretation specially for pneumoconiosis as per ILO specification
- c. Imaging techniques and their interpretation
- d. Ultrasonography (USG)
- e. CT Scan and High-resolution computed tomography (HRCT)
- f. Magnetic resonance imaging (MRI)

**E. Work physiology – Ergonomics, Biomechanics and stressors**

- a. Evaluation of physiological work stress → Exercise test system
- b. Techniques for different anthropometric measurements and nutritional assessment and their interpretation

- c. Recording of posture and movements

#### **F. Biostatistics**

- a. Data entry, analysis and interpretation
- b. Data storing, record keeping and record retrieval
- c. Basic statistics and its interpretation.
- d. Statistical sampling, applicability in field condition → limitation, accessibility, modelling, standard equation development.
- e. Multivariate analysis and its usefulness in Occupational Health

#### **G. Biochemical and toxicological tests**

Biochemical and toxicological investigations for common parameters will be demonstrated.

- **Placement in the Industry and ESI Hospital, Research Laboratories and Institutes for acquiring the above skills.**

## ***SYLLABUS***

### **Course contents**

#### **A. Basic Sciences**

##### **1. Anatomical Aspects**

Basic knowledge of the structure of different systems of human body *vis - a - vis* their applied aspects and relevant systems like respiratory, gastro-intestinal, haemopoietic, locomotor and dermal systems.

##### **2. Physiological Aspects**

Basic knowledge on the functions of the different systems of human body as well as their applied aspects, with particular stress on respiratory functions, haemopoietic system, dermal system and special organs like eye and ear etc.

##### **3. Pharmacological Aspects**

Basic and applied pharmacokinetics of chemicals including medicine and toxic substances.

##### **4. Pathological Aspects**

- General concept of pathology
- Different pathological manifestations of human systems to pollutants, toxicants, pathogens etc.
- Target organs, mechanisms of deposition of particles in different systems and pathological changes in different tissues.
- Methods for collections of samples (both biopsy and autopsy), preservation, preparing sections, staining, examination and diagnosis.

- Advanced techniques including cryo-techniques and their applications.
- Body defence mechanism and immunity.

## 5. Microbiological Aspects

- General concepts of microbes, their classifications
- Principles of pathogenesis, mode of transmission; general measures for control of transmission; measures for disinfection; affinity; multiple invasion
- General approach to the application of laboratory techniques for diagnosis.

## 6. Parasitological Aspects

- General classification, important parasites, their invasion, pathogenesis caused and comprehensive methods of management,
- Role of parasites causing nutritional derangements and impairment of body defence mechanism causing difficulty in diagnosis.

## 7. Biostatistics

- Definition, scope and application; relevance in occupational health
- Rates and ratios, Vital statistics, accident statistics
- Proforma designing, validation, data collection, compilation, interpretation and presentation
- Statistical analysis – application of statistical methods eg Standard deviation, Chi square tests, student t test, variance, regression etc.
- Record keeping, storing, retrieval
- Data interpretation
- Education and communication.

## 8. Sociology

Basic socio-economic and demographic profiles pertinent to health, environment and other influencing factors.

## B. Applied aspects of Environmental and Occupational Health

### 1. Industrial Hygiene

- Definitions, concepts and scope,
- Assessment of personal exposure; sampling, analysis, interpretation of results etc.
- Assessment of work environment and community environment; sampling analysis and interpretation,
- Air pollution; sampling, analysis and interpretation,
- Biological monitoring – blood, urine, hairs, nails etc.
- Concepts of safe working limits (TLV –TWA, STEL; MAC etc)
- Principles of air sampling,
- Air movement,
- Temperature including thermal comfort standards and clothing,

- Humidity,
- Illumination,
- Noise (including octave frequency analysis),
- Vibration,
- Ventilation,
- Ionising and non-ionising radiation,
- Environmental Sanitation; Sampling, analysis, interpretation etc,
- Disposal of solid and liquid wastes,
- Control measures,
- Environmental Planning,
- Indoor air pollution.

## 2. **Safety**

- Definition
- Importance
- Applicability
- Awareness generation programme
- Job suitability
- Training and re-training of personnel
- Emergency management: both offsite and onsite.
- Mock drill
- Accident prevention
- Control measures
- Maintenance of records
- Safety devices – development and application
- Ethical and statutory legal obligations

## 3. **Occupational / Environmental Health Epidemiology**

- Definition, concept, scope, epidemiological triad
- Basic knowledge of general and work environment
- Medical examination - history, general examination, pre-placement, periodical and special examination and check list development
- Epidemiological investigational approach
- Occupational disease diagnosis including special and specific investigations
- Record keeping, computing, storing, data retrieval
- Teaching, research and awareness programme
- Group surveillance
- Nutritional assessment
- Training of personnel in Occupational Health and safety measures
- Accident prevention and cause analysis
- Concept of multi-sectorial approach

- Principles of epidemiological studies
- Dose response relationship
- Risk assessment, evaluation and management

#### **4. Occupational / Environmental Health Disorders and Diseases**

- History of development of Occupational and Environmental Medicine
- Occupational history taking in detail including socioeconomic determinants
- Proforma designing
- Natural history of Occupational diseases
- Pre-employment, pre-placement, periodical and special examinations, different specific tests
- Mechanism of Industrial injuries
- Specific Occupational and Environmental Diseases - clinical features, pathogenesis, investigations, diagnosis, management including preventive measures
- Zoonotic diseases
- Techniques of undertaking X-ray of Pneumoconiosis and interpretation of ILO standard film of Pneumoconiosis
- Dose-response relationship
- Protective devices and its applicability
- Occupational and Environmental carcinogenesis and mutagenesis
- Effects on Reproductive Health
- Health problems of agricultural, plantation and mines workers
- Problems of Child Labour, migrant labourers and women workers
- Compression sickness
- Other specific work environmental disorders.
- Radiation sickness
- Occupational therapy and physiotherapy
- Job responsibilities of Occupational Physicians / Hygienists / Nurses
- Rehabilitative measures for Occupational Environmental diseases
- Vocational counselling
- Provision of service delivery
- Planning for hospital facility for treating casualty cases and for extended specialist services for specific diseases/disorders e.g., chest, ophthalmic, cardiovascular, dermatological, orthopaedic, STD, AIDS etc.
- Training for collection of data in the field.
- Statutory Acts & Rules
- Research and development programmes

#### **5. Biochemical Aspects**

- Biochemical techniques; their importance as diagnostic and prognostic tools



- Common biochemical parameters - estimation, interpretation in relation to occupational exposures.
- Biological monitoring and specific biochemical parameter estimation, detection of earliest possible bio-markers for undertaking appropriate remedial measures (including early warning signs).
- Importance of strict quality control and double blind trial for ensuring the accuracy of estimation and proper functioning of equipment.
- The concepts followed in functioning/use of different equipments, loop holes, rectification and if required, standard factor determination, finding out the efficacy of the curative measures adopted and/or helping in diagnosis after application of chelating agents etc.
- Newer investigational aspects as and when developed.

## **6. Toxicological Aspects of Occupational / Environmental Exposures**

- Definition, concept, scope, and application
- Toxicants – classification and effects on particular system, patho-physiology of toxic exposures and Toxidromes
- Chemicals – acids, alkalies, fumes, vapours, gases, smoke etc
- Solvents – Benzene, toluene, xylene, alcohol, acetone etc
- Pesticides – Organochlorine and organophosphorus compounds, carbamates, barium carbonate, hydrogen sulphide etc.
- Metals – Lead, Arsenic, Mercury, Manganese, Cadmium, Magnesium, Barium, Berillium, Fluorine, Nickel, Phosphorus, etc
- Pesticides

## **7. Mycological Aspects**

Fungi, their classification, clinical and laboratory techniques for diagnosis (including immuno-diagnostic techniques), special emphasis on fungi responsible for causing various occupational diseases, their management including preventive measures, opportunistic infection.

## **8. Immunological and Serological Aspects**

- Concepts, methods applied for diagnosis, detailed discussion regarding application of its importance as diagnostic tool, principles for diagnostic criteria, methods for estimation of antibody titres, and its interpretation, role of different immunoglobulins in differential diagnosis.
- Recent advanced techniques of practical importance and their proper interpretation.

## **9. Work physiology – Ergonomics, Biomechanics and stressors**

- Definition, scope and application; relevance in occupational health
- Work stress
- Ventilation and Illumination

- Job suitability
- Exercise test system
- Anthropometric measurements
- Clothing
- Nutritional assessment with special reference to occupational Health
- Musculoskeletal disorders and Fatigue
- Physical fitness
- Work posture
- Movement
- Repetitive action
- Job categorisation (load)
- Shift duty

#### 10. **Respiratory Physiology - Pulmonary Function Tests**

- Definition, scope and application, relevance in occupational health
- Role as diagnostic and prognostic tests
- Measurements of parameters in field conditions
- Inspiratory and expiratory flow rates.
- Vital Capacity; Forced Vital Capacity
- Forced expiratory volume (FEV)<sub>1</sub>; FEV<sub>1</sub>%; FEV<sub>2</sub>, FEV<sub>3</sub> etc
- FEF 200-1200; FEF<sub>25-75%</sub>; FEF 75-85% etc
- IMBC
- Residual Volume, Tidal Volume
- Forced Expiratory Flow Rates
- Body surface area calculation
- Pulmonary Function Tests impairments (Restrictive, Obstructive and mixed type)
- Development of predictive equation, Predictive value calculation, Interpretation
- Broncho-dilation tests
- Reversibility and irreversibility of PFT
- Lung Compliance
- Blood gas analysis
- Dose response relationship

#### 11. **Mental Health and Neurobehavioral Science**

- Definition, scope and application; relevance in occupational and environmental health
- Job efficiency, Job satisfaction, wage satisfaction
- Job security
- Hours of Work – rest, recreational measures, vocational guidance, sickness absenteeism, accident and preventive measures, rehabilitative measures
- Benefits (medical, sickness. maternity, disability, dependence, funeral, creche etc)

- Incentives, motivation, leadership, monotony, boredom, discontent, fatigue, socio-environmental factors
- Addiction & drug abuse, other behavioural changes eg. gambling, illicit sex, STD, AIDS, criminal activities etc
- Assurance
- Social obligation
- Public relations
- Family environment

## **12. Environmental Sanitation and Maternal & Child Health**

General concept, specific requirement in occupational and environmental health, child labour, crèche, social security

## **13. Legislation**

- Definition, scope and application; relevance in occupational health
- Different Acts and Rules eg. Indian Factories Act, ESI Act, Mines Act, Payment of Wages Act, Maternity Benefit Act, Workmen Compensation Act, Evidence Act, Child Labour Act, Dock Labour Board Act, Environmental Protection Act & Rules, etc
- Labour welfare and labour relations
- Management Information System (MIS) Rules
- Inspection of Factories and mines
- Personal protective measures
- Basic training and orientation training
- Various statutory requirements

# ***TEACHING AND LEARNING METHODS***

## **Postgraduate teaching programme**

### **General Principles**

Acquisition of practical competencies being the keystone of PG medical education, PG training should be skills oriented. Learning in PG programme should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

### **Teaching methodology**

Teaching methodology includes:

1. Didactic lectures
2. **Seminar/journal club presentation (once a fortnight).**

Evaluation sheets may be incorporated for the purpose of assessment of presentations. The following points may be considered in the scheme for evaluation of presentations.

- Topic selection
  - Completeness of presentation
  - Clarity of presentation
  - Understanding of the subject and ability to convey the same
  - Whether relevant references have been consulted
  - Ability to convey points in favor and against the subject under discussion
  - Proper use of audio-visual aids
  - Ability to answer questions
3. **Case presentation, case work up, case handling/management (once a week)**
  4. **Attending clinical grand rounds / clinic-pathological conference**  
The post graduate students are encouraged to attend lectures and grand rounds of other clinical and basic science departments of the hospital.
  5. **Attendance at Scientific meetings, CME programmes**  
The post graduate students are expected to attend meetings related to the subject, present papers/posters in these meetings.
  6. **Paper/poster presentation:**  
A post graduate student of a post graduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
  7. **Teaching skills:**  
The post graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
  8. A **logbook** should be maintained recording the duration of posting, the period of absence, if any, skills performed, and remarks if any by the teacher/faculty member. The logbook should also record journal clubs, seminars attended and partaken as well as undergraduate teaching activities the post graduate student has participated and should be signed by the faculty in charge.
  9. Department should encourage e-learning activities

### **Theoretical Training**

The broad coverage will be on:

1. Occupational & Environmental Medicine
2. Occupational & Environmental Hygiene
3. Occupational & Environmental Epidemiology
4. Occupational & Environmental Toxicology
5. Work physiology- Ergonomics, Biomechanics
6. Mental Health and neurobehavioral Sciences
7. Safety

8. Respiratory physiology
9. Biochemistry
10. Radiology and Imaging
11. Bio-statistics
12. Molecular Biology
13. Public Health

#### **A. Occupational & Environmental Medicine**

- Basic knowledge of general and work environment
- Medical examination – General examination, pre-employment, pre-placement, periodic and special examination
- Occupational Disease diagnosis including special, sophisticated and specific investigations
- Proper and specific treatment
- Record keeping and computing
- Health Education
- Rehabilitation
- Teaching, research and awareness programme
- Group surveillance
- Administrative responsibilities including liaison with other organisation
- Policy making
- Mental Health & Psychology
- Personal Hygiene
- House Keeping
- Emergency management including preparedness for onsite and offsite emergencies, mock drilling and its utility.
- Recognition of possible factors affecting health & comfort
- Evaluation of degree of hazards
- Design of control measures for improving working conditions
- Public Health
- Cost effective benefits
- Waste disposal including hospital waste
- Biological monitoring and other special investigations
- Sickness absenteeism
- Motivation
- Compensable and notifiable diseases → Schedules and Procedures
- Occupational diseases
- Accident and injury
- Mental Health including executive health

- Work related diseases including Communicable and non-communicable Diseases in relation to Occupational and Environmental Health
- Pulmonary Function Tests and their role in Occupational Health Management
- Radiological examinations including imaging in disease diagnosis of Occupational Health origin
- Biochemical examination including role of biomarkers.
- Immunology
- Molecular Biology
- Information Technology & Bio-informatics
- Role of NGO's, Govt Organisations, Trade Unions
- Awareness programmes

## **B. Occupational Hygiene**

- **Industrial Hazards** → Toxic agents (Organic and Inorganic) → Solid, Liquid, Gases & Vapours (Lead, Manganese, Cadmium, Magnesium, Arsenic, Mercury, Barium, Beryllium, Fluorine, Nickel, Chromium, Phosphorus, Acids, Alkalis, Solvents etc).
- Toxicological effect/s of each material along with pathophysiology
- **Industrial Hygiene** → Work environment assessment, concepts of Safe Working Limits (TLV (TWA, STEL), MAC etc.); → Air Sampling, Air movement, Temperature, Humidity, Illumination, Noise with octave band frequency analysis, Vibration → Air pollution, extremes of pressure, ionising & non-ionising radiation, heat, cold and fibres.
- **Biological hazards**→ Insects, Mites, Moulds, Bacteria, Fungi, Yeasts, Virus
- Engineering control of industrial hazards

## **C. Ergonomics**

- Posture, Movement, Work pressure, Monotony, Repetitive actions, Illumination & visibility

## **D. Occupational Safety**

- Safety → Accident prevention and cause analysis → statistics, reporting
- Rehabilitation → at work place and in-house
- Emergency Planning → onsite and offsite, mock drill
- Role of physician in control of industrial disasters
- Management Information System (MIS) Rules
- Personal protective equipments
- Disaster management

## **E. Occupational Health and Safety Awareness Programme**

- Training of personnel for Occupational health and safety
- Role of audio-visual aids and mass media

## **F. Legislation**

- Laws and labour relations →Factories Acts & Rules; Mines Acts & Rules; ESI Act, Payment of wages Acts, Maternity Benefit Act, Workers Compensation Acts, Evidence Act etc and the relevant rules.
- Inspection of Factories and Mines in India

## **G. Biostatistics**

- Computation of Data, Data Analysis, Record keeping & record retrieval
- Data mining and warehousing.
- Interpretation logical conclusion and reporting
- Dose response relationship and target Organs and Specific Diseases
- Functional Physiological aspects of target organs with relation to exposure → Effect of exposure to the organs in respect of temperature, humidity, air velocity, other climatic factors, light and illumination, noise & vibration, low frequency electricity, magnetic fields; ionising and non-ionising radiation, high & low atmospheric pressure; thermal comfort standard; evaporative heat loss (thermal stress)

## **H. Nutrition**

- Assessment of nutritional status → Diet, Anthropometry, Hb%, Proteins; energy requirement of different category of workers
- Organisation and maintenance of canteen

## **I. Social obligation**

## **J. Environmental Sanitation**

## **K. Maternal & Child health**

1. Women workers including Reproductive Health

**During the training programme, patient safety is of paramount importance, therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.**

## ***ASSESSMENT***

### **Formative Assessment, during the training**

**Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.**

### **Internal Assessment**

Internal Assessment should be valid, objective, reliable and should be conducted in theory and practical examination. Feedback from the internal assessment should be given to the student and will be part of the final examination.

### **FORMATIVE ASSESSMENT, ie., during the training**

**Quarterly assessment during the Diploma training should be based on:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

**The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).**

### **SUMMATIVE ASSESSMENT, ie., at the end of training**

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in two parts:

#### **1. Theory Examination:**

**There will be three papers as per the following:**

**Paper I:** Basic Medical Sciences

**Paper II:** Occupational/Environmental Health, Occupational/Environmental Hygiene, Toxicology, Epidemiology, Recent Advances

**Paper III:** Safety, Work physiology, Respiratory Physiology, Mental Health and Neurobehavioral Sciences, Legislation etc.

#### **2. Clinical/Practical and oral examination:**

- I. Work environment monitoring / Biochemical Analysis (2hours)
- II. Clinical Case – I (Long Case) (45 Mins.)
- III. Clinical Case II (Short Case: 20 Mins each)
- IV. OSCE /Spot Examination (2 Min. each)
- V. Other performances: Dissertation, ESI Hospital, Industry
- VI. Viva-voce

### **Recommended Reading**

#### **Books (latest edition)**

1. Parkes WR - Occupational lung disorders, Butterworths, London.



2. International Labour Organisation – Encyclopaedia of Occupational Safety and Health, Geneva.
3. National Institute of Occupational Safety and Health – Occupational respiratory diseases, US Dept. of Health and Human Service, Washington D C (Revised), USA.
4. World Health Organisation - Harmful exposure to mineral dusts, World Health Forum, 15(2).
5. Gardner AW - Current approaches to Occupational Health 2, John Wright & Sons Ltd, Bristol, London, Boston.
6. International Labour Organisation - Guidelines for the use of ILO International classification of Radiographs of Pneumoconiosis, Occup Saf Health Series No 22, Geneva.
7. The Diseases of Occupations - Donald Hunter, Hodder and Stoughton, London/Toronto.
8. Occupational Health - Harrington and Gill, Blackwell Scientific Publication, Oxford.
9. Epidemiology of Occupational Health – WHO, European Series No 20.
10. Monitoring for Health Hazards at Work - Gill and Ashton, Grant McIntyre, London.
11. Recent Advances in Occupational Health - MacDonald, Churchill Livingstone, London.
12. Occupational Diseases: A Guide to Their Recognition - National Institute of Occupational Safety and Health, NIOSH, Cincinnati.
13. Occupational Health Practice - Schilling, Butterworths, London.
14. Current Approaches to Occupational Medicine - Ward Gardner, J. Wright, Bristol.
15. Occupational Medicine - Zenz, Yearbook Publication, Chicago.
16. Epidemiology in Medical Practice - Barker and Rose, Churchill Livingstone, Edinburgh.
17. Occupational Epidemiology - Monson, CRC Press, Boca Raton.
18. Early Detection of Occupational Diseases -WHO, Geneva.
19. Epidemiology: Principle and Methods - MacMohan and Pugh, Little Brown, Boston.

## **Journals**

**Three international and two national journals (all indexed)**

**Postgraduate Students Appraisal Form  
Clinical Disciplines**

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis / Research work										
7.	Log Book Maintenance										

Publications

Yes/ No

Remarks\*

\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD