Objectives of Medical Graduate Training Program (MBBS):

(Adapted from Salient features of regulations on Graduate Medical Education, 1997; Amended upto February 2012. Medical Council of India, New Delhi)

1. **National Goals:** At the end of undergraduate program, the medical student should be able to :
   a) Recognize `health for all' as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal.
   b) Learn every aspect of National policies on health and devote himself/ herself to its practical implementation.
   c) Achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
   d) Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
   e) Become exemplary citizen by observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

2. **Institutional Goals:** The undergraduate students coming out of a medical institute should:
   a) Be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
   b) Be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems.
   c) Appreciate rationale for different therapeutic modalities; be familiar with the administration of the "essential drugs" and their common side effects.

d) Be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.

e) Possess the attitude for continued self-learning and to seek further expertise or to pursue research in any chosen area of medicine.

f) Be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:

- Family Welfare and Maternal and Child Health.
- Sanitation and water supply.
- Prevention and control of communicable and non-communicable diseases.
- Immunization.
- Health Education.

g) Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery.

h) Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

i) Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

j) Be competent to work in a variety of health care settings.

k) Have personal characteristics and attitudes required for professional life, such as, personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

Subject-wise Curriculum for Undergraduate Teaching (MBBS):

(Adapted from Salient features of regulations on Graduate Medical Education, 1997;
Amended upto February 2012. Medical Council of India, New Delhi)

Phase I: In the teaching of these subjects stress shall be laid on basic principles of the subjects with more emphasis on their applied aspects.

A. HUMAN ANATOMY

a) Goal: The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the gross and microscopic structure and development of human body to provide a basis for understanding the clinical correlation of organs or structures involved and the anatomical basis for the disease presentations.

b) Objectives:

- Knowledge: At the end of the course the student should be able to:
  - Comprehend the normal disposition, clinically relevant interrelationships, functional and cross sectional anatomy of the various structures in the body.
  - Identify the microscopic structure and correlate elementary ultra-structure of various organs and tissues and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes.
  - Comprehend the basic structure and connections of the central nervous system to analyze the integrative and regulative functions of the organs and systems. He/ She should be able to locate the site of gross lesions according to the deficits encountered.
  - Demonstrate knowledge of the basic principles and sequential development of the organs and systems; recognize the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He/ She should be able to explain the developmental basis of the major variations and abnormalities.
- Skills: At the end of the course the student should be able to:
  - Identify and locate all the structures of the body and mark the topography of the living anatomy.
  - Identify the organs and tissues under the microscope.
  - Understand the principles of karyotyping and identify the gross congenital anomalies.

- Understand principles of newer imaging techniques and interpretation of Computerized Tomography (CT) Scan, Sonogram etc.
- Understand clinical basis of some common clinical procedures i.e., intramuscular & intravenous injection, lumbar puncture and kidney biopsy etc.

c) Integration: From the integrated teaching of other basic sciences, student should be able to comprehend the regulation and integration of the functions of the organs and systems in the body and thus interpret the anatomical basis of disease process.

B. HUMAN PHYSIOLOGY INCLUDING BIO-PHYSICS

PHYSIOLOGY

a) Goal: The broad goal of the teaching of undergraduate students in Physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

b) Objectives:

- Knowledge: At the end of the course the student will be able to:
  - Explain the normal functioning of all the organ systems and their interactions for well-coordinated total body function.
  - Assess the relative contribution of each organ system to the maintenance of the milieu interior.
  - Elucidate the physiological aspects of normal growth and development.
  - Describe the physiological response and adaptations to environmental stresses.
  - List the physiological principles underlying pathogenesis and treatment of disease.
- Skills: At the end of the course the student should be able to:
  - Conduct experiments designed for study of physiological phenomena.
  - Interpret experimental/investigative data.
  - Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

c) Integration: At the end of the integrated teaching the student should acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

BIOPHYSICS

a) Objectives: The broad goal of teaching Biophysics to undergraduate students is that they should understand basic physical principles involved in the functioning of body organs in normal and diseased conditions.

- Total time for teaching Biophysics = 5 hours (Didactic lectures = 3 hours; Tutorial/group discussion = 1 hour; Practical = 1 hour).
- Topic distribution:
    - Lectures: Physical principles of transport across cell membranes and across capillary wall, Bio potentials, Physical principles governing flow of blood in heart and blood vessels and physical principles governing flow of air in air passages.
    - Tutorial/group discussion: On the topic covered in didactic lectures.
    - Practical: Demonstration of:
        - Biopotential on oscilloscope.
        - Electro Encephalogram (EEG).
        - Electro Myelogram (EMG).
        - Electro Cardiogram (ECG).

C. BIOCHEMISTRY (including Medical Physics and Molecular Biology)

a) Goal: The broad goal of the teaching of undergraduate students in biochemistry is to make them understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving clinical problems.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
    - Describe the molecular and functional organization of a cell and list its subcellular components.
    - Delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal.

- Summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered.
- Describe digestion and assimilation of nutrients and consequences of malnutrition.
- Integrate the various aspects of metabolism and their regulatory pathways.
- Explain the biochemical basis of inherited disorders with their associated sequel.
- Describe mechanisms involved in maintenance of body fluid and pH homeostasis.
- Outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine.
- Summarize the molecular concepts of body defense and their application in medicine.
- Outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis.
- Familiarize with the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data.
- The ability to suggest experiments to support theoretical concepts and clinical diagnosis.

- Skills: At the end of the course, the student should be able to:
  - Make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening and diagnosis.
  - Analyze and interpret investigative data.
  - Demonstrate the skills of solving scientific and clinical problems and decision making.

c) Integration: The knowledge acquired in biochemistry should help the students to integrate molecular events with structure and function of the human body in health and disease.

D. INTRODUCTION TO HUMANITIES & COMMUNITY MEDICINE (Including introduction to the subjects of Demography, Health Economics, Medical Sociology, Hospital Management, Behavioral Sciences inclusive of Psychology)

a) Objectives:

- Knowledge: The student shall be able to:
  - Explain the principles of sociology including demographic population dynamics.

- Identify social factors related to health, disease and disability in the context of urban and rural societies.
- Appreciate the impact of urbanization on health and disease.
- Observe and interpret the dynamics of community behavior.
- Describe the elements of normal psychology and social psychology.
- Observe the principles of practice of medicine in hospital and community setting.

- Skills: At the end of the course, the student should be able to make use of:
  - Principles of practice of medicine in hospital and community settings and familiarization with elementary nursing practices.
  - Art of communication with patients including history taking and medico-social work.

b) Teaching of community medicine should be both theoretical as well as practical. The practical aspects of the training program should include visits to the health establishments and to the community where health intervention programs are in operation. In order to inculcate in the minds of the students the basic concepts of community medicine to be introduced in this phase of training, it is suggested that the detailed curriculum drawn should include at least 30 hours of lectures, demonstrations, seminars etc. together with at least 15 visits of two hours each.

Phase II:

A. PATHOLOGY:

a) Goal: The broad goal of the teaching of undergraduate student in Pathology is to provide the students with a comprehensive knowledge of the mechanisms and causes of disease, in order to enable him/her to achieve complete understanding of the natural history and clinical manifestations of disease.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
  - Describe the structure and ultrastructure of a sick cell, mechanisms of cell degeneration, cell death and repair and be able to correlate structural and functional alterations.
  - Explain the pathophysiological processes which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it.

- Describe the mechanisms and patterns to tissue response to injury such that she/he can appreciate the pathophysiology of disease processes and their clinical manifestations.
- Correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance.

- Skills: At the end of the course, the student should be able to:
  - Describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results.
  - Perform the simple bed-side tests on blood, urine and other biological fluid samples.
  - Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders.
  - Understand biochemical/ physiological disturbances that occur as a result of disease in collaboration with pre-clinical departments.

c) Integration: At the end of training he/she should be able to integrate the causes of disease and relationship of different etiological factors (social, economic and environmental) that contribute to the natural history of diseases most prevalent in India.

B. MICROBIOLOGY

a) Goal: The broad goal of the teaching of undergraduate students in Microbiology is to provide an understanding of the natural history of infectious disease in order to deal with the etiology, pathogenesis, laboratory diagnosis, treatment and control of infections in the community.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
  - State the infective micro-organisms of the human body and describe the host parasite relationship.
  - List pathogenic micro-organisms (bacteria, viruses, parasites, fungi) and describe the pathogenesis of the diseases produced by them.
  - State or indicate the modes of transmission of pathogenic and opportunistic organisms and their sources, including insect vectors responsible for transmission of infection.

- Describe the mechanisms of immunity to infections.
- Acquire knowledge on suitable antimicrobial agents for treatment of infections and scope of immunotherapy and different vaccines available for prevention of communicable diseases.
- Apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections.
- Recommend laboratory investigations regarding bacteriological examination of food, water, milk and air.

- Skills: At the end of the course, the student should be able to:
  - Plan and interpret laboratory investigations for the diagnosis of infectious diseases and to correlate the clinical manifestations with the etiological agent.
  - Identify the common infectious agents with the help of laboratory procedures and use antimicrobial sensitivity tests to select suitable antimicrobial agents.
  - Perform commonly employed bed-side tests for detection of infectious agents such as blood film for malaria, filaria, Gram staining and AFB staining and stool sample for ova cyst.
  - Use the correct method of collection, storage and transport of clinical material for microbiological investigations.

c) Integration: The student should understand infectious diseases of national importance in relation to the clinical, therapeutic and preventive aspects.

C. PHARMACOLOGY

a) Goal: The broad goal of the teaching of undergraduate students in Pharmacology is to inculcate a rational and scientific basis of therapeutics.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
  - Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs.
  - List the indications, contraindications, interactions and adverse reactions of commonly used drugs.
  - Indicate the use of appropriate drug in a particular disease with consideration to its cost, efficacy and safety for:

        - Individual needs.
        - Mass therapy under national health program.
    - Describe the pharmacokinetic basis, clinical presentation, diagnosis and management of common poisonings.
    - List the drugs of addiction and recommend the management.
    - Classify environmental and occupational pollutants and state the management issues.
    - Indicate causations in prescription of drugs in special medical situations such as pregnancy, lactation, infancy and old age.
    - Integrate the concept of rational drug therapy in clinical pharmacology.
    - State the principles underlying the concept of 'Essential Drugs'.
    - Evaluate the ethics and modalities involved in the development and introduction of new drugs.
- Skills: At the end of the course, the student should be able to:
    - Prescribe drugs for common ailments.
    - Recognize adverse reactions and interactions of commonly used drugs.
    - Observe experiments designed for study of effects of drugs, bioassay and interpretation of the experimental data.
    - Scan information on common pharmaceutical preparations and critically evaluate drug formulations.

c) Integration: Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments and pre-clinical departments.

D. FORENSIC MEDICINE INCLUDING TOXICOLOGY

a) Goal: The broad goal of the teaching of undergraduate students in Forensic Medicine is to produce a physician who is well informed about medico-legal responsibilities in practice of medicine. He/ She will also be capable of making observations and inferring conclusions by logical deductions to set enquiries on the right track in criminal matters and connected medico-legal problems. He/ She acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:

- Identify the basic medico-legal aspects of hospital and general practice.
- Define the medico-legal responsibilities of a general physician while rendering community service either in a rural primary health center or an urban health center.
- Appreciate the physician's responsibilities in criminal matters and respect for the codes of medical ethics.
- Diagnose, manage and identify also legal aspects of common acute and chronic poisonings.
- Describe the medico-legal aspects and findings of post-mortem examination in case of death due to common unnatural conditions & poisonings.
- Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.
- Describe the general principles of analytical toxicology.

- Skills: At the end of the course, the student should be able to:
  - Make observations and logical inferences in order to initiate enquiries in criminal matters and medico-legal problems.
  - Diagnose and treat common emergencies in poisoning and manage chronic toxicity.
  - Make observations and interpret findings at postmortem examination.
  - Observe the principles of medical ethics in the practice of his profession.

c) Integration: Department shall provide an integrated approach towards allied disciplines like Pathology, Radiology, Forensic Sciences, Hospital Administration etc. To impart training regarding medico legal responsibilities of physicians at all levels of health care. Integration with relevant disciplines will provide scientific basis of clinical toxicology e.g. Medicine, pharmacology etc.

E. COMMUNITY MEDICINE

a) Goal: The broad goal of the teaching of undergraduate students in Community Medicine is to prepare them to function as community and first level physicians in accordance with the institutional goals.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
  - Describe the health care delivery system including rehabilitation of the disabled in the country.

- Describe the National Health Programs with particular emphasis on maternal and child health programs, family welfare planning and population control.
- List epidemiological methods and describe their application to communicable and non-communicable diseases in the community or hospital situation.
- Apply bio-statistical methods and techniques.
- Outline the demographic pattern of the country and appreciate the roles of the individual, family, community and socio-cultural milieu in health and disease.
- Describe the health information systems.
- Enunciate the principles and components of primary health care and the national health policies to achieve the goal of 'Health for All'.
- Identify the environmental and occupational hazards and their control.
- Describe the importance of water and sanitation in human health.
- To understand the principles of health economics, health administration, health education in relation to community.

- Skills: At the end of the course, the student should be able to:
  - Use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention.
  - Collect, analyze, interpret and present simple community and hospital based data.
  - Diagnose and manage common health problems and emergencies at the individual, family and community levels keeping in mind existing health care resources and in the context of the prevailing socio-cultural beliefs.
  - Diagnose and manage maternal and child health problems and advise a couple and the community on the family planning methods available in the context of the national priorities.
  - Diagnose and manage common nutritional problems at the individual and community level.
  - Plan, implement and evaluate a health education programmer with the skill to use simple audio-visual aids.
  - Interact with other members of the health care team and participate in the organization of health care services and implementations of national health programs.

c) Integration: Develop capabilities of synthesis between cause of illness in the environment or community and individual health and respond with leadership qualities to institute remedial measures for this.

Clinical Subjects of Phase II and Phase III: The teaching and training in clinical subjects will commence at the beginning of Phase II and continue throughout. The clinical subjects will be taught to prepare the MBBS graduates to understand and manage clinical problems at the level of a practitioner. Exposure to subject matter will be limited to orientation and knowledge required of a general doctor. Maximum attention to the diagnosis and management of the most common and important conditions encountered in general practice should be emphasized in all clinical subject areas. Instructions in clinical subjects should be given both in outpatient and in-patient during clinical posting.

Each of the clinical departments shall provide integrated teaching calling on pre-clinical, para-clinical and other clinical departments to join in exposing the students to the full range of disciplines relevant to each clinical area of study. Problem approach will be emphasized based on basic social sciences and a continuation of clinical and laboratory syllabi to optimally understand and manage each clinical condition.

The course shall comprise of:

A. MEDICINE & ITS ALLIED SPECIALTIES.

B. SURGERY & ITS ALLIED SPECIALTIES.

C. PEDIATRICS.

D. OTO-RHINO-LARYNGOLOGY.

E. OPHTHALMOLOGY.

F. OBSTETRICS & GYNECOLOGY.

G. COMMUNITY MEDICINE.

A. MEDICINE & ITS ALLIED SPECIALTIES

A.1 MEDICINE

a) Goal: The broad goal of the teaching of undergraduate students in Medicine is to have the knowledge, skills and behavioral attributes to function effectively as the first contact physician.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
  - Diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, tropical and environmental diseases.
  - Outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications.
  - Propose diagnostic and investigative procedures and ability to interpret them.
  - Provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required.
  - Recognize geriatric disorders and their management.
- Skills: At the end of the course, the student should be able to:
  - Develop clinical skills (history taking, clinical examination and other instruments of examination) to diagnose various common medical disorders and emergencies.
  - Refer a patient to secondary and/or tertiary level of health care after having instituted primary care.
  - Perform simple routine investigations like hemogram, stool, urine, sputum and biological fluid examinations.
  - Assist the common bedside investigative procedures like pleural tap, lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

c) Integration:

- With Community Medicine and Physical Medicine and Rehabilitation to have the knowledge and be able to manage important current national health programs, also to be able to view the patient in his/her total physical, social and economic milieu.
- With other relevant academic inputs which provide scientific basis of clinical medicine e.g. Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology.

A.2 PSYCHIATRY

a) Goal: The aim of teaching the undergraduate student in psychiatry is to impart such knowledge and skills that may enable him to diagnose and treat common psychiatric disorders, handle psychiatric emergencies

and to refer complications/ unusual manifestations of common disorders and rare psychiatric disorders to the specialist.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
  - Comprehend nature and development of different aspects of normal human behavior like learning, memory, motivation, personality and intelligence.
  - Recognize differences between normal and abnormal behavior.
  - Classify psychiatric disorders.
  - Recognize clinical manifestations of the following common syndromes and plan their appropriate management of organic psychosis, functional psychosis, schizophrenia, affective disorders, neurotic disorders, personality disorders, psycho-physiological disorders, drug and alcohol dependence, psychiatric disorders of childhood and adolescence.
  - Describe rational use of different modes of therapy in psychiatric disorders.
- Skills: The student should be able to:
  - Interview the patient and understand different methods of communications in patient-doctor relationship.
  - Elicit detailed psychiatric case history and conduct clinical examination for assessment of mental status.
  - Define, elicit and interpret psycho-pathological symptoms and signs.
  - Diagnose and manage common psychiatric disorders.
  - Identify and manage psychological reactions and psychiatric disorders in medical and surgical patients in clinical practice and in community setting.

c) Integration: Training in Psychiatry should prepare the students to deliver preventive, promotive, curative and rehabilitative services for the care of patients both in the family and community and to refer advance cases to a specialized Psychiatry/ Mental Hospital. Training should be integrated with the departments of Medicine, Neuro-Anatomy, Behavioral Sciences and Forensic medicine.

A.3 DERMATOLOGY AND SEXUALLY TRANSMITTED DISEASES

a) Goal: The aim of teaching the undergraduate student in Dermatology, S.T.D. and Leprology is to impart such knowledge and skills that may enable him to diagnose and treat common ailments and to refer rare diseases or complications/ unusual manifestations of common diseases, to the specialist.

b) Objectives:

- Knowledge: At the end of the course of Dermatology, S.T.D. and Leprology, the student shall be able to:
    - Demonstrate sound knowledge of common diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm their diagnosis.
    - Demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory diseases.
    - Describe the mode of action of commonly used drugs, their doses, side-effects/toxicity, indications and contra-indications and interactions.
    - Describe commonly used modes of management including the medical and surgical procedures available for the treatment of various diseases and to offer a comprehensive plan of management for a given disorder.
- Skills: The student should be able to:
    - Interview the patient, elicit relevant and correct information and describe the history in a chronological order.
    - Conduct clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies.
    - Perform simple, routine investigative and office procedures required for making the bed-side diagnosis, especially the examination of scrapings for fungus, preparation of slit smears and staining for AFB for leprosy patients and for STD cases.
    - Take a skin biopsy for diagnostic purposes.
    - Manage common diseases recognizing the need for referral for specialized care, in case of inappropriateness of therapeutic response.

A.4 TUBERCULOSIS AND RESPIRATORY DISEASES

a) Goal: The aim of teaching the undergraduate student in Tuberculosis and Chest Diseases is to impart such knowledge and skills that may enable him/her to diagnose and manage common ailments affecting the chest with the special emphasis on management and prevention of Tuberculosis and especially National Tuberculosis control program.

b) Objectives:

- Knowledge: At the end of the course of Tuberculosis and Chest-diseases, the student shall be able to:
    - Demonstrate sound knowledge of common chest diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm their diagnosis.
    - Demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory disease.
    - Describe the mode of action of commonly used drugs, their doses, side-effects/toxicity, indications and contra-indications and interactions.
    - Describe commonly used odes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan of management inclusive of National Tuberculosis Control Program.
- Skills: The student shall be able to:
    - Interview the patient, elicit relevant and correct information and describe the history in chronological order.
    - Conduct clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies.
    - Perform simple, routine investigative and office procedures required for making the bed side diagnosis, especially sputum collection and examination for etiologic organisms especially Acid Fast Bacilli (AFB), interpretation of the chest x-ray and respiratory function test.
    - Interpret and manage various blood gases and PH abnormalities in various respiratory diseases.
    - Manage common diseases recognizing need for referral for specialized care, in case of inappropriateness of therapeutic response.
    - Assist in the performance of common procedures, like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage/aspiration.

c) Integration: The broad goal of effective teaching can be obtained through integration with departments of Medicine, Surgery, Microbiology, Pathology, Pharmacology and Preventive & Social Medicine.

B. SURGERY & ITS ALLIED SPECIALITIES

B.1 SURGERY (including Pediatric Surgery)

a) Goal: The broad goal of the teaching of undergraduate students in Surgery is to produce graduates capable of delivering efficient first contact surgical care.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
    - Describe etiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
    - Define indications and methods for fluid and electrolyte replacement therapy including blood transfusion.
    - Define asepsis, disinfection and sterilization and recommended judicious use of antibiotics.
    - Describe common malignancies in the country and their management including prevention.
    - Enumerate different types of anesthetic agents, their indications, and mode of administration, contraindications and side effects.
- Skills: At the end of the course, the student should be able to:
    - Diagnose common surgical conditions both acute and chronic, in adult and children.
    - Plan various laboratory tests for surgical conditions and interpret the results.
    - Identify and manage patients of hemorrhagic, septicaemic and other types of shock.
    - Be able to maintain patent air-way and resuscitate:
        - A critically injured patient.
        - Patient with cardio-respiratory failure.
        - A drowning case.
    - Monitor patients of head, chest, spinal and abdominal injuries, both in adults and children.
    - Provide primary care for a patient of burns.

- Acquire principles of operative surgery, including pre-operative, operative and post-operative care and monitoring.
- Treat open wounds including preventive measures against tetanus and gas gangrene.
- Diagnose neonatal and pediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary centers.
- Identify congenital anomalies and refer them for appropriate management.
- In addition to these, he should have observed/assisted/ performed the following:
    - Incision and drainage of abscess.
    - Debridement and suturing open wound.
    - Venesection.
    - Excision of simple cyst and tumors.
    - Biopsy of surface malignancy.
    - Catheterization and nasogastric intubation.
    - Circumcision.
    - Meatotomy.
    - Vasectomy.
    - Peritoneal and pleural aspirations.
    - Diagnostic proctoscopy.
    - Hydrocele operation.
    - Endotracheal intubation.
    - Tracheostomy and cricothyroidotomy.
    - Chest tube insertion.

c) Integration: The undergraduate teaching in surgery should be integrated at various stages with different pre and para and other clinical departments.

B.2 ORTHOPEDICS

a) Objectives:

- Knowledge: The student should be able to:

- Explain the principles of recognition of bone injuries and dislocation.
- Apply suitable methods to detect and manage common infections of bones and joints.
- Identify congenital, skeletal anomalies and their referral for appropriate correction or rehabilitation.
- Recognize metabolic bone diseases as seen in this country.
- Explain etiogenesis, manifestations, diagnosis of neoplasm affecting bones.

- Skills: At the end of the course, the student should be able to:
  - Detect sprains and deliver first aid measures for common fractures and sprains and manage uncomplicated fractures of clavicle, Collis's, forearm, phalanges etc.
  - Techniques of splinting, plaster, immobilization etc.
  - Management of common bone infections learns indications for sequestration, amputations and corrective measures for bone deformities.
  - Aspects of rehabilitation for Polio, Cerebral Palsy and Amputation.
- Application: Be able to perform certain orthopedic skills, provide sound advice of skeletal and related conditions at primary or secondary health care level.

b) Integration: Integration with Anatomy, Surgery, Pathology, Radiology and Forensic Medicine is done.

B.3 RADIODIAGNOSIS & IMAGING

a) Goal: The broad goal of teaching the undergraduate medical students in the field of Radio-diagnosis should be aimed at making the students realize the basic need of various radio-diagnostic tools in medical practice. They should be aware of the techniques required to be undertaken in different situations for the diagnosis of various ailments as well as during prognostic estimations.

b) Objectives:

- Knowledge: The student should be able to:
  - Understand basics of X-ray production, its uses and hazards.
  - Appreciate and diagnose changes in bones - like fractures, infections, tumors and metabolic bone diseases.
  - Identify and diagnose various radiological changes in disease conditions of chest and mediastinum, skeletal system, G.I. Tract, Hepatobiliary system and G.U. system.

- Learn about various imaging techniques, including isotopes C.T., Ultrasound, M.R.I. and D.S.A.

- Skill: At the end of the course the student should be able to:
  - Use basic protective techniques during various imaging procedures.
  - Interpret common X-ray, radio-diagnostic techniques in various community situations.
  - Advise appropriate diagnostic procedures in specialized circumstances to appropriate specialists.

B.4 RADIOTHERAPY

a) Goal: The broad goal of teaching the undergraduate medical students in the field of Radiotherapy is to make the students understand the magnitude of the ever-increasing cancer problem in the country. The students must be made aware about steps required for the prevention and possible cure of this dreaded condition.

b) Objectives:

- Knowledge: The students should be able to:
  - Identify symptoms and signs of various cancers and their steps of investigations and management.
  - Explain the effect of radiation therapy on human beings and the basic principles involved in it.
  - Know about radio-active isotopes and their physical properties.
  - Be aware of the advances made in radiotherapy in cancer management and have knowledge of various radio-therapeutic equipment while treating a patient.
- Skill: At the completion of the training program, the student should be able to:
  - Take a detailed clinical history of the case suspected of having a malignant disease.
  - Assist various specialists in administration of anticancer drugs and in application and use of various radio therapeutic equipment, while treating a patient.

C. PEDIATRICS (including Neonatology)

The course includes systematic instructions in growth and development, nutritional needs of a child, immunization schedules and management of common diseases of infancy and childhood, scope of Social Pediatrics and counseling.

a) Goal: The broad goal of the teaching of undergraduate students in Pediatrics is to acquire adequate knowledge and appropriate skills for optimally dealing with major health problems of children to ensure their optimal growth and development.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
    - Describe the normal growth and development during fetal life, neonatal period, childhood and adolescence and outline deviations thereof.
    - Describe the common pediatric disorders and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation.
    - State age related requirements of calories, nutrients, fluids, drugs etc. in health and disease.
    - Describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse.
    - Outline national programs relating to child health including immunization programs.
- Skills: At the end of the course, the student should be able to:
    - Take a detailed pediatric history, conduct an appropriate physical examination of children including neonates, make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigation results and plan and institute therapy.
    - Take anthropometric measurements, resuscitate newborn infants at birth, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current national programs, perform venesection, start an intravenous saline and provide nasogastric feeding.
    - Conduct diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural tap and ascitic tap.
    - Distinguish between normal newborn babies and those requiring special care and institute early care to all new born babies including care of preterm and low birth weight babies, provide correct guidance and counseling in breast feeding.
    - Provide ambulatory care to all sick children, identify indications for specialized/inpatient care and ensure timely referral of those who require hospitalization.

c) Integration: The training in pediatrics should prepare the student to deliver preventive, primitive, curative and rehabilitative services for care of children both in the community and at hospital as part of a team in an integrated form with other disciplines, e.g. Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology, Forensic Medicine, Community Medicine and Physical Medicine and Rehabilitation.

D. OTO-RHINO-LARYNGOLOGY

a) Goal: The broad goal of the teaching of undergraduate students in Otorhinolaryngology is that the undergraduate student has acquired adequate knowledge and skills for optimally dealing with common disorders and emergencies and principles of rehabilitation of the impaired hearing.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
    - Describe the basic pathophysiology of common ENT diseases and emergencies.
    - Adopt the rational use of commonly used drugs, keeping in mind their adverse reactions.
    - Suggest common investigative procedures and their interpretation.
- Skills: At the end of the course, the student should be able to:
    - Examine and diagnose common ENT problems including the pre-malignant and malignant disorders of the head and neck.
    - Manage ENT problems at the first level of care and be able to refer whenever necessary.
    - Assist/ carry out minor surgical procedures like ear syringing, ear dressings, nasal packing etc.
    - Assist in certain procedures such as tracheostomy, endoscopies and removal of foreign bodies.

c) Integration: The undergraduate training in ENT will provide an integrated approach towards other disciplines especially neurosciences, ophthalmology and general surgery.

E. OPHTHALMOLOGY

a) Goal: The broad goal of the teaching of students in ophthalmology is to provide such knowledge and skills to the students that shall enable him to practice as a clinical and as a primary eye care physician and also to function effectively as a community health leader to assist in the implementation of National Program for the prevention of blindness and rehabilitation of the visually handicapped.

b) Objectives:

- Knowledge: At the end of the course, the student should have knowledge of:
  - Common problems affecting the eye.
  - Principles of management of major ophthalmic emergencies.
  - Main systemic diseases affecting the eye.
  - Effects of local and systemic diseases on patient's vision and the necessary action required to minimize the squeal of such diseases.
  - Adverse drug reactions with special reference to ophthalmic manifestations.
  - Magnitude of blindness in India and its main causes.
  - National program of control of blindness and its implementation at various levels.
  - Eye care education for prevention of eye problems.
  - Role of primary health center in organization of eye camps.
  - Organization of primary health care and the functioning of the ophthalmic assistant.
  - Integration of the national program for control of blindness with the other national health programs.
  - Eye bank organization
- Skills: At the end of the course, the student should be able to:
  - Elicit a history pertinent to general health and ocular status.
  - Assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiotz tonometry, staining for corneal pathology, confrontation perimetry, subjective refraction including correction of presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and Cover test.
  - Diagnose and treat common problems affecting the eye.
  - Interpret ophthalmic signs in relation to common systemic disorders.
  - Assist/observe therapeutic procedures such as subconjunctival injection, Corneal/ Conjunctival foreign body removal, carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorraphy.
  - Provide first aid in major ophthalmic emergencies.
  - Assist to organize community surveys for visual checkup.
  - Assist to organize primary eye care service through primary health centers.

- Use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation.
- Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.

c) Integration: The undergraduate training in Ophthalmology will provide an integrated approach towards other disciplines especially neurosciences, Otorhinolaryngology, General Surgery and Medicine.

F. OBSTETRICS AND GYNAECOLOGY (including family welfare and family planning)

a) Goal: The broad goal of the teaching of undergraduate students in Obstetrics and Gynecology is that he/she should acquire understanding of anatomy, physiology and pathophysiology of the reproductive system and gain the ability to optimally manage common conditions affecting it.

b) Objectives:

- Knowledge: At the end of the course, the student should be able to:
  - Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it.
  - Detect normal pregnancy, labor puerperium and manage the problems he/she is likely to encounter therein.
  - List the leading causes of maternal and perinatal morbidity and mortality.
  - Understand the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterilization and their complications.
  - Identify the use, abuse and side effects of drugs in pregnancy, pre-menopausal and post-menopausal periods.
  - Describe the national program of maternal and child health and family welfare and their implementation at various levels.
  - Identify common gynecological diseases and describe principles of their management.
  - State the indications, techniques and complications of surgeries like Caesarian section, laparotomy, abdominal and vaginal hysterectomy, Fothergill operation and vacuum aspiration for M.T.P.
- Skills: At the end of the course, the student should be able to:

- Examine a pregnant woman; recognize high risk pregnancies and make appropriate referrals.
- Conduct a normal delivery, recognize complications and provide postnatal care.
- Resuscitate the newborn and recognize congenital anomalies.
- Advise a couple on the use of various available contraceptive devices and assist in insertion in and removal of intra-uterine contraceptive devices.
- Perform pelvic examination, diagnose and manage common gynecological problems including early detection of genital malignancies.
- Make a vaginal cytological smear, perform a post coital test and wet vaginal smear examination for Trichomonas vaginalis; moniliasis and gram stain for gonorrhea.
- Interpretation of data of investigations like biochemical, histopathological, radiological, ultrasound etc.

c) Integration: The student should be able to integrate clinical skills with other disciplines and bring about coordinations of family welfare programs for the national goal of population control.

d) General Guidelines for Training:

- Attendance of a maternity hospital or the maternity wards of a general hospital including (i) antenatal care (ii) the management of the puerperium and (iii) a minimum period of 5 months in-patient and out-patient training including family planning.
- Of this period of clinical instruction, not less than one month shall be spent as a resident pupil in a maternity ward of a general hospital.
- During this period, the student shall conduct at least 10 cases of labor under adequate supervision and assist in 10 other cases.
- A certificate showing the number of cases of labor attended by the student in the maternity hospital and/or patient homes respectively, should be signed by a responsible medical officer on the staff of the hospital and should state:
    - that the student has been present during the course of labor and personally conducted each case, making the necessary abdominal and other examinations under the supervision of the certifying officer who should describe his official position.

- That satisfactory written history of the cases conducted including wherever possible antenatal and postnatal observations were presented by the student and initialed by the supervising officer.

- Family Planning: Training in Family Planning should be emphasized in all the three phases and during internship as per guidelines.

G. COMMUNITY MEDICINE

The teaching and training of community medicine will continue during the first two semesters of phase III (clinical Phase). The goals, objectives and skills to be acquired by the student have already been outlived in Phase II (Para Clinical Phase).