

## Programme-specific Learning Outcomes

Seema Dental College is running **BDS (Bachelor of Dental Surgery) programme since 2003 with annual intake 100 students (100 seats) in each academic year;** recognized by DCI and affiliated to HNB Garhwal University.

### **Programme-specific Learning Outcomes of Dental Graduate (BDS) Programme**

During UG dental training program leading to BDS degree, the students are taught many subjects to acquire adequate knowledge, necessary skills and reasonable attitudes, which are required for carrying out all activities appropriate to general dental practice involving prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The **programme-specific Learning Outcomes of Dental Graduate (BDS) Programme are as follows-**

#### **BDS I Year**

##### **1. HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY & MEDICAL GENETICS**

The students should gain the knowledge and insight into, the functional anatomy of the normal human head and neck, functional histology and an appreciation of the genetic basis of inheritance and disease, and the embryological development of clinically important structures. So that relevant anatomical & scientific foundations are laid down for the clinical years of the BDS course. At the end of the first year BDS course in Anatomical Sciences the undergraduate student is expected to:

1. Know the normal disposition of the structures in the body while clinically examining a patient and while conducting clinical procedures.
2. Know the anatomical basis of disease and injury.
3. Know the microscopic structure of the various tissues, a pre-requisite for understanding of the disease processes.
4. Know the nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.
5. Have an idea about the basis of abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards.
6. Know the sectional anatomy of head neck and brain to read the features in radiographs and pictures taken by modern imaging techniques.

7. Know the anatomy of cardio-pulmonary resuscitation.
8. To locate various structures of the body and to mark the topography of the living anatomy.
9. To identify various tissues under microscope.
10. To identify the features in radiographs and modern imaging techniques.
11. To detect various congenital abnormalities.

## **2. GENERAL HUMAN PHYSIOLOGY**

In BDS I year, the broad goal of the teaching undergraduate students in Human Physiology is to provide the comprehensive knowledge of the normal functions of the organ systems of the body and to facilitate an understanding of the physiological basis of health and disease. At the end of the course, the student will be able to:

1. Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function.
2. Assess the relative contribution of each organ system towards the maintenance of the milieu interior.
3. List the physiological principles underlying the pathogenesis and treatment of disease.
4. Conduct experiments designed for the study of physiological phenomena.
5. Interpret experimental and investigative data
6. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

## **3. BIOCHEMISTRY**

In BDS I year, the major aim is to provide a sound but crisp knowledge on the biochemical basis of the life processes relevant to the human system and to dental/medical practice. This includes learning of following topics. At the end of the course the students would be able to acquire a useful core of information, which can be retained for a long time and will be helpful for diagnosis, prognosis and treatment of oral/dental/systemic diseases.

1. Chemistry & metabolic processes of carbohydrates, lipids, proteins and nucleic acids.
2. Biochemical genetics and molecular biology
3. Nutrition & dietics, Minerals, Vitamins, anti-vitamins, anti-metabolites, enzymes and enzyme inhibitors to form the basis for the future study of medical subjects.
4. An overview of metabolic regulation is taught by covering hormonal action, second messengers and regulation of enzyme activities.
5. Medical aspects of biochemistry like inborn errors of metabolism, gout, diabetes mellitus, organ function tests, jaundice, serum diagnostic enzymes, etc.

#### **4. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY**

Dental Anatomy including Embryology and Oral Histology is a composite of basic Dental Sciences & their clinical applications. After a course on Dental Anatomy including Embryology and Oral Histology-

1. BDS I year students are expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological/non-pathological states.
2. The students should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.
3. The students must know the basic knowledge of various research methodologies.
4. The students should acquire basic skills in-
  - Carving of crowns of permanent teeth in wax.
  - Microscopic study of Oral tissues.
  - Identification of Deciduous & Permanent teeth.
  - Age estimation by patterns of teeth eruption from plaster casts of different age groups.

#### **BDS II Year**

##### **1. GENERAL PATHOLOGY & MICROBIOLOGY**

**PATHOLOGY:** At the end of the BDS II year, the students should be competent to apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry. This will enable the students-

1. To demonstrate and apply basic facts, concepts and theories in the field of Pathology.
2. To recognize and analyze pathological changes at macroscopically and microscopical levels and explain their observations in terms of disease processes.
3. To Integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.
4. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.
5. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

**MICROBIOLOGY:** Study of microbiology will introduce the students to the exciting world of microbes and make the students aware of various branches of microbiology, importance, significance and contribution of each branch to mankind and other fields of medicine. At the end of the Microbiology course the students are expected to:

1. Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.
2. Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Community Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.
3. Understand and practice various methods of sterilization and disinfection in dental clinics.
4. Have a sound understanding of various infectious diseases and lesions in the oral cavity.
5. Acquire the skill to diagnose, differentiate various oral lesions.
6. Able to select, collect and transport clinical specimens to the laboratory.
7. Able to carry out proper aseptic procedures in the dental clinic.

## **2. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS**

In BDS II year, the broad goal of teaching under graduate students in pharmacology is to inculcate rational and scientific basis of therapeutics keeping in view of dental curriculum and Profession. At the end of the course the students shall be able to:

1. Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular.
2. List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason.
3. Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, and safety for individual and mass therapy needs.
4. Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients.
5. Integrate the rational drug therapy in clinical pharmacology.
6. Indicate the principles underlying the concepts of "Essential drugs".
7. Prescribe drugs for common dental and medical ailments.
8. Appreciate adverse reactions and drug interactions of commonly used drugs.
9. Observe experiments designed for study of effects of drugs.
10. Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.
11. **INTEGRATION:** Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

### **3. DENTAL MATERIALS**

Aim of the course is to present basic chemical and physical properties of Dental materials as they are related to its manipulation to give a sound educational background so that the practice of the dentistry emerged from art to empirical status of science as more information through further research becomes available. It is also the aim of the course of Dental materials to provide with certain criteria of selection and which will enable to discriminate between facts and propaganda with regards to claims of manufactures. At the end of the course the students shall be able to:

1. To understand the evolution and development of science of dental material.
2. To explain purpose of course in dental materials to personnel concerned with the profession of the dentistry. Knowledge of physical and chemical properties.
3. To understand the biomechanical requirements of particular restorative procedure. An intelligent compromise of the conflicting as well as co-ordinating factors into the desired Ernest.
4. To lay down standards or specifications of various materials to guide to manufacturers as well as to help professionals.
5. To search for newer and better materials which may answer the requirements with greater satisfaction?
6. To understand and evaluate the claims made by manufactures of dental materials

### **4. PRE-CLINICAL PROSTHODONTICS AND CROWN & BRIDGE**

Students should have good knowledge and skills regarding these topics after completion of Pre-clinical Prosthodontics subject:

- Able to understand and use various dental materials.
- Familiar with the concept of Introduction & Biomechanics of the edentulous state including Applied Anatomy and Physiology.
- Should have knowledge of Residual ridge resorption. Understanding the patients. Mental attitude for the proper Diagnosis and treatment planning for patients, with some teeth remaining or with no teeth remaining. a) Systemic status. b) Local factor. c) The geriatric patient. d) Diagnostic procedures.
- Dental Impressions -in detail. a) Muscles of facial expression. b) Biologic considerations for maxillary and mandibular impression including anatomy landmark and their interpretation. c) Impression objectives. d) Impression materials. e)

Impression techniques. f) Maxillary and mandibular impression procedures. i. Preliminary impressions. ii. Final impressions.

- Should know in details about Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation). H. Record bases and occlusion rims- in detail. a) Materials & techniques. b) Useful guidelines and ideal parameters. c) Recording and transferring bases and occlusal rims.
- Recording maxilla-mandibular relation. a) Vertical relations. b) Centric relation records. c) Eccentric relation records. d) Lateral relation records. Tooth selection and arrangement. a) Anterior teeth. b) Posterior teeth. c) Esthetic and functional harmony. Relating inclination of teeth to concept of occlusion- in brief. a) Neurocentric concept. b) Balanced occlusal concept.
- Principles of Removable Partial Denture Design & Survey and design – in brief.
- Able to carry out treatment of routine prosthodontic procedures

## **5. PRE CLINICAL CONSERVATIVE DENTISTRY**

- Student should be able to identification and use all hand cutting instruments.
- They should be able to identification and use rotary cutting instruments and burs.
- Student should know and identify all the GV Black cavity preparation on patient.
- Able to prepare cavity on typhodont tooth placed on phantom head.
- Able to manipulate varnish and bases like Zinc Phosphate, Poly-carboxylate, Glass Ionomers, Zinc Oxide Eugenol cements.
- Identification and manipulation of various matrices, tooth separators.
- Able to apply base, varnish, matrix and wedge placement on typhodont tooth placed on phantom head.
- Mixing, handling and proper disposing of amalgam material.
- Student should be able to do restoration with amalgam on typhodont tooth placed on phantom head.
- Polishing of above restoration.
- Familiar with the concept for composites restoration followed by polishing and finishing of the restoration of composites.

## **BDS III Year**

### **1. ORAL PATHOLOGY & ORAL MICROBIOLOGY**

At the end of Oral Pathology & Oral Microbiology course, the students of BDS IV year should be able to comprehend -

1. The different types of pathological processes that involves the oral cavity.
2. The manifestations of common diseases, their diagnosis & correlation with clinical pathological processes.
3. An understanding of the oral manifestations of systemic diseases should help in correlating with the systemic physical signs & laboratory findings.
4. The student should understand the underlying biological principles governing treatment of oral diseases.
5. The principles of certain basic aspects of Forensic Odontology.
6. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides.
7. Study of the disease process by surgical specimens.
8. Study of teeth anomalies/polymorphisms through tooth specimens & plaster casts.
9. Microscopic study of plaque pathogens.
10. Study of haematological preparations (blood films) of anaemias & leukemias.
11. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

## **2. GENERAL MEDICINE**

While teaching and training in General Medicine Department, special emphasis is given throughout on the importance of

1. Various diseases as applicable to dentistry.
2. Special precautions/contraindication of anesthesia and various dental procedures in different systemic diseases.
3. Oral manifestations of systemic diseases.
4. Medical emergencies in dental practice.
5. A dental student is taught in such a manner, the he/she should acquire basic skills
  - to record the arterial pulse, blood pressure and be capable of suspecting by sight and superficial examination of the body – diseases of the heart, lungs, kidneys, blood etc.
  - to handle medical emergencies encountered in dental practice.
  - to take history, do general physical examination (including build, nourishment, pulse, BP, respiration, clubbing, cyanosis, jaundice, lymphadenopathy, oral cavity) and to examine CVS, RS and abdomen and facial nerve.

## **3. GENERAL SURGERY**

To acquaint the students with various diseases, which may require surgical expertise and to train the student to analyze the history and be able to do a thorough physical examination of

the patient. The diseases as related to head and neck region are to be given due importance, at the same time other relevant surgical problems are also to be addressed. At the end of BDS III year, the dental students should have a good theoretical knowledge of various ailments, and be practically trained to differentiate benign and malignant diseases and be able to decide which patient requires further evaluation. The students should acquire basic to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy, etc.

## **BDS IV Year**

### **1. CONSERVATIVE DENTISTRY AND ENDODONTICS**

The dental graduates acquire the following knowledge during the period of training-

1. To diagnose and treat simple restorative work for teeth.
2. To gain knowledge about aesthetic restorative material and to translate the same to patients needs.
3. To gain the knowledge about endodontic treatment on the basis of scientific foundation.
4. To carry out simple endodontic treatment.
5. To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

The dental graduates acquire following skills necessary for practice of dentistry-

- To use medium and high speed hand pieces to carry out restorative work.
- To use and familiarize endodontic instruments and materials needed for carrying out simple endodontic treatment.
- To achieve the skills to translate patients esthetic needs along with function.

### **2. ORAL & MAXILLOFACIAL SURGERY**

To produce a dental graduate who is competent in performing extraction of teeth under both local and general anesthesia, prevent and manage related complications, acquire a reasonable knowledge and understanding of the various diseases, injuries, infections occurring in the Oral & Maxillofacial region and offer solutions to such of those common conditions and has an exposure in to the in-patient management of maxillofacial problems. At the end of the BDS IV year and the clinical training the dental graduates are expected to -

1. apply the knowledge gained in the related medical subjects like pathology, microbiology and general medicine in the management of patients with oral surgical problem.

2. diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.
3. perform range of surgical treatments.
4. decide the requirement of a patient to have oral surgical specialist opinion or treatment.
5. understand the principles of in-patient management.
6. understand the management of major oral surgical procedures and principles involved in patient management.
7. know ethical issues and communication ability.

The dental graduates acquire following skills necessary for practice of dentistry-

- to examine any patient with an oral surgical problem in an orderly manner. Be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis.
- Should be competent in the extraction of teeth under both local and general anesthesia.
- Should be able to carry out certain minor oral surgical procedures under L.A. like frenectomy, alveolar procedures & biopsy etc.
- Should be able to assess, prevent and manage various complications during and after surgery.
- Should be able to provide primary care and manage medical emergencies in the dental office.
- Should be able to understand the management of major oral surgical problems and principles involved in inpatient management.

### **3. ORAL MEDICINE AND RADIOLOGY**

The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.

**(i)** Diagnosis, Diagnostic methods and Oral Medicine- subdivided into three sections-

(A) Diagnostic methods

(B) Diagnosis & differential diagnosis

(C) Oral Medicine & Therapeutics.

**(ii)** Oral Radiology

At the end of the BDS IV year and the clinical training the dental graduates are expected-

1. To diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of orofacial disorders with drugs and physical agents.
2. To know importance, role, use and techniques of radiographs/digital radiograph and other imaging methods in diagnosis.
3. To understand the clinical and radiographic aspects of Forensic Odontology.

#### **4. ORTHODONTICS & DENTAL ORTHOPAEDICS**

Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyse and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures. Students are trained to fabricate orthodontic appliances by conducting intricate wire bending procedures.

#### **5. PUBLIC HEALTH DENTISTRY**

Students learn to prevent and control oral diseases and promote oral health through organized community efforts. At the conclusion of the BDS course the students shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, Nutrition, Environment and their role in health, basics of dental statistics, epidemiological methods, National oral health policy with emphasis on oral health policy. Students shall develop skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies. Students should develop a positive attitude towards the problems of the society and must take responsibilities in providing health. The dental students should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral disease.

#### **6. PERIODONTOLOGY**

The students shall acquire the skill to perform dental scaling, diagnostic tests of periodontal diseases; to use the instruments for periodontal therapy and maintenance of the same. The students shall develop attitude to impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease. The student shall also develop an attitude to perform the treatment with full aseptic precautions; shall develop an attitude to prevent iatrogenic diseases; to conserve the tooth to the maximum possible time by maintaining periodontal health and to refer the patients who require specialist's care.

#### **7. PROSTHODONTICS AND CROWN & BRIDGE**

Training is structured to achieve knowledge and skill in providing Prosthodontic therapy and to produce dental graduates-

1. with knowledge on prosthetics needs of patients, fabrication of all prosthodontic modes of treatment
2. able to diagnose, motivate and treat patients who are partially and completely edentulous (including geriatric patients) with complete and partial dentures
3. skilled enough to identify cases requiring specialist prosthodontic treatment needs and refer them for further follow up.

## **8. PAEDIATRIC & PREVENTIVE DENTISTRY**

Aim is to produce dental graduates with ability to diagnose common dental problems and/or capability to assess growth and development variations and suggest necessary referrals or actions as needed timely. Dental graduates can also effectively and efficiently perform basic dental treatments in children from birth to adolescence with proper behavior management of child and the parent, as well as instill positive dental attitude with preventive modalities.

### **Knowledge:**

- To have adequate knowledge and understanding of the scientific and systematic procedure of history taking and examination of Orofacial region to arrive at proper diagnosis and management
- To have understood the morphology of primary teeth and basic differences in the principles of cavity preparation in primary and permanent teeth
- To have essential knowledge of the preventive (oral prophylaxis, topical fluoride application) and therapeutic measures (restoration of carious teeth, extraction of primary teeth) in caries management

### **Skills:**

- To communicate and manage child patient
- To obtain proper clinical history, examination of the patient, perform diagnostic procedures and interpret them to arrive at a provisional diagnosis
- To prepare various cavity designs on primary and permanent teeth and restore them using different restorative materials.
- To extract primary teeth

### **Attitude:**

- To deliver optimum treatment to pediatric patients with tender loving care irrespective of the social status, caste, creed or religion of the patient
- Willing to share the knowledge and clinical experience with professional colleagues
- Respect patient rights and privileges, including patients/parents right to information, obtaining consent from parents for each procedure and right to seek a second opinion

- Develop attitude to seek opinion from an allied medical and dental specialists as and when required.

**Communicative Skills and Ability:**

- Develop adequate communication skills to manage child patient, explaining various treatment options to parents and obtain a true informed consent from them for the most appropriate treatment available at that point of time
- Develop the ability to communicate with professional colleagues
- Develop ability to present seminars and develop leadership skills.