

Curriculum

Proficiency Certificate Level

Dental Science (Dental Hygiene)

Three Year's Program – Yearly System
(Second and Third year)



Council for Technical Education and Vocational Training

Curriculum Development Division

Sanothimi, Bhaktapur

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Introduction

The Government of Nepal has called for the provision of basic health service to all by establishing a network of health services in remote and urban areas. In this regard, the Council for Technical Education and Vocational Training (CTEVT) has been contributing towards the development of different level of health personnel. In the field of dental health, CTEVT has planned to produce middle level dental service providers in the form of Dental Hygienist. The Council will award **"Certificate in Dental Science (Dental Hygiene)"** to those candidates who successfully complete the requirements as prescribed by this curriculum. The Certificate in Dental Science (Dental Hygiene) graduates will be able to work as Dental Assistant in the hospital and clinical settings under the supervision of the Dental Surgeon and also will be able to serve in the community.

This course is based on the academic requirements to provide basic dental/oral health care services as a middle level health professional. After completion of the course, the graduate is expected to perform the duty of hospital and clinic assistant as per assigned by Nepal Health Professional Council independently in different health institutions in Nepal and abroad. The program is of three academic years' duration. The first year course focuses on basic science and foundational subjects, the second year course focuses on dental science and practical simultaneously and the third year is given to the application of learned skills and knowledge within the comprehensive practical settings, in hospitals or Clinics.

The foundational subjects like English, Nepali, Physics, Chemistry, and Mathematics (offered in diffusion model of curricular programme) are applicable in the medical field. The disciplinary subjects of medical field are included in all three years. This curricular programme also makes the provision of project works as well as real world of work practices in the specific medical areas. The curriculum structure and the subject wise content reflect the details of this curriculum. In brief, this curriculum will guide to its implementers to produce competent and highly employable middle level technical workforces in medical field.

Curriculum Title

Certificate in Dental Science (Dental Hygiene)

Aim

The program aims to produce middle level technical personnel with sound academic knowledge equipped with perfect technical skills that can be faced in real life situation.

Program Objectives

After the completion of this program, the graduates will be enabled to:

- prepare technically competent middle level human resource who will demonstrate positive attitude and respect to the profession and to the socio-cultural values
- develop quality & ethical dental Science practice under the supervision of Dental Surgeon in the hospitals as well as in the community settings
- develop the attitude to educate and motivate the patients and community to practice plaque control measures to maintain oral Science
- acquire the skill to perform diagnosis & dental scaling of common periodontal disease
- use periodontal instruments for basic periodontal therapy and maintenance of the same
- develop attitude to impart preventive measures of oral health, especially preventing the periodontal diseases

- conserve the tooth to the maximum possible extent by maintaining periodontal health & ART procedure
- develop an attitude to perform the procedures under full aseptic measures
- develop attitude to prevent iatrogenic disease, and
- perform dental X-rays and Photography and refer for final diagnosis to dental surgeon
- refer the patients who require specialized care to Dental Surgeon / specialist
- provide Extended Services as defined/specified in curriculum

Group Size

The group size will be maximum of 40 (forty) students in a batch.

Entry Criteria

- SLC Pass or SEE with minimum GPA 2.0 and C grade in Compulsory Mathematics, English & Science.
- TSLC in Dental Hygiene with minimum 66.68%.
- Should pass entrance examination as administered by CTEVT.

Duration

The total duration of this curricular program is three academic years. The program is based on yearly system. Moreover, one academic year consists up to 39 weeks and one academic week consists up to 40 hours excluding evaluation period.

Medium of Instruction

The medium of instruction will be in English and/or Nepali.

Pattern of Attendance

Minimum of 90% attendance in each subject is required to appear in the respective final examination.

Teachers and Students Ratio

The ratio between teachers and students must be:

- Overall ratio of teacher and student must be 1:10 (at the institution level)
- 1:40 for theory and tutorial classes
- 1:10 for practical classes

Qualification of Teachers and Instructors

- The program coordinator should be a master's degree holder in the related area.
- The disciplinary subject related teacher and demonstrators should be a bachelor's degree holder in the related area.
- The foundational subject related teacher should be master degree holder in the related area.

Instructional Media and Materials

The following instructional media and materials are suggested for the effective instruction and demonstration.

- **Printed Media Materials** (Assignment sheets, Hand-outs, Information sheets, Individual training packets, Procedure sheets, Performance Check lists, Textbooks etc.).
- **Non-projected Media Materials** (Display, Model, Flip chart, Poster, Writing board etc.).

- **Projected Media Materials** (Opaque projections, Overhead transparencies, Slides etc.).
- **Audio-Visual Materials** (Audiotapes, Films, Slide-tape programs, Videodiscs, Videotapes etc.).
- **Computer-Based Instructional Materials** (Computer-based training, Interactive video etc.)

Teaching Learning Methodologies

The methods of teachings for this curricular program will be a combination of several approaches such as; illustrated lecture, tutorial, group discussion, demonstration, simulation, guided practice, fieldwork, block study, industrial practice, report writing, term paper presentation, heuristic and other independent learning exercises.

Theory: Lecture, discussion, assignment, interaction, seminar, group work.

Practical: Demonstration, observation, simulation, guided practice, self-practice, industrial practice and project work.

Mode of Education

There will be inductive and deductive mode of education.

Examination and Marking Scheme

a. Internal assessment

- There will be a transparent/fair evaluation system for each subject both in theory and practical exposure.
- Each subject will have internal assessment at regular intervals and students will get the feedback about it.
- Weightage of theory and practical marks are mentioned in course structure.
- Continuous assessment format will be developed and applied by the evaluators for evaluating student's performance in the subjects related to the practical experience.

b. Final examination

- Weightage of theory and practical marks are mentioned in course structure.
- Students must pass in all subjects both in theory and practical for certification. If a student becomes unable to succeed in any subject, s/he will appear in the re-examination administered by CTEVT.
- Students will be allowed to appear in the final examination only after completing the internal assessment requirements.

c. Requirement for final practical examination

- Professional of relevant subject instructor must evaluate final practical examinations.
- One evaluator in one setting can evaluate not more than 20 students.
- Practical examination should be administered in actual situation on relevant subject with the provision of at least one internal evaluator from the concerned or affiliating institute led by external evaluator nominated by CTEVT.
- Provision of re-examination will be as per CTEVT policy.

d. Final practicum evaluation will be based on:

- Institutional practicum attendance - 10%
- Logbook/Practicum book maintenance - 10%

- Spot performance (assigned task/practicum performance/identification/arrangement preparation/measurement) - 40%
- Viva voce :
 - Internal examiner - 20%
 - External examiner - 20%
 -

e. Pass marks:

- The students must secure minimum 40% marks in theory and 50% marks in practical. Moreover, the students must secure minimum pass marks in the internal assessment and in the semester final examination of each subject to pass the subject.

Provision of Back Paper

There will be the provision of back paper but a student must pass all the subjects of all year within six years from the enrollment date; however there should be provision of chance exam for final year students as per CTEVT rules.

Disciplinary and Ethical Requirements

- Intoxication, insubordination or rudeness to peers will result in immediate suspension followed by the review of the disciplinary review committee of the institute.
- Dishonesty in academic or practical activities will result in immediate suspension followed by administrative review, with possible expulsion.
- Illicit drug use, bearing arms in institute, threats or assaults to peers, faculty or staff will result in immediate suspension, followed by administrative review with possible expulsion.

Grading System

The following grading system will be adopted:

- Distinction: 80% and above
- First division: 65% to below 80%
- Second division: 50 % to below 65%
- Pass division: Pass marks to Below 50%

Certification and Degree Awards

- Students who have passed all the components of all subjects of all 3 years are considered to have successfully completed the program.
- Students who have successfully completed the program will be awarded with a degree of "**Certificate in Dental Science (Dental Hygiene)**".

Career Opportunity

The graduates will be eligible for the position equivalent to Non-gazette 1st class/Level 5 (technical) as prescribed by the Public Service Commission of Nepal and other related agencies. The graduate will be eligible for registration with the related health professional council in the grade as provisioned in the related Council Act (if any).

Course structure of Certificate in Dental Science (Dental Hygiene)
First Year

S N	Subjects	Mode			Distribution of Marks						Total Marks
					Theory			Practical			
		T	P	Total	Internal	Final	Exam Hour	Internal	Final	Exam Hour	
1	English	3	0	3	20	80	3	-	-	-	100
2	Nepali	3	0	3	20	80	3	-	-	-	100
3	Social Studies	2	0	2	10	40	1.5	-	-	-	50
4	Anatomy & Physiology	4	1	5	20	60	3	10	10	3	100
5	Physics	4	2	6	20	60	3	10	10	3	100
6	Chemistry	4	2	6	20	60	3	10	10	3	100
7	Zoology	3	2	5	20	60	3	10	10	3	100
8	Botany	3	2	5	20	60	3	10	10	3	100
9	Mathematics & Statistics	4	1	5	20	60	3	10	10	3	100
	Total	30	10	40	170	560		60	60		850

Second Year

S.N	Subject	Mode		Weekly Hrs	Distribution of Marks						Total Marks
		T	P		Theory			Practical			
					Internal	Final	Time (Hrs)	Internal	Final	Time (Hrs)	
1	Oral Anatomy and Physiology	2	2	4	10	40	1.5	20	30	3	100
2	Dental Materials, Instruments and Assisting	2	2	4	10	40	1.5	20	30	3	100
3	Basic Periodontology I	4	4	8	20	80	3	40	60	4	200
4	Oral Pathology & Microbiology	3	2	5	15	60	3	20	30	3	125
5	Health Education	1	2	3	5	20	1.5	20	30	3	75
6	Epidemiology & community diagnosis	2	2	4	10	40	1.5	20	30	3	100
7	Environmental Health,	2	2	4	10	40	1.5	20	30	3	100
8	Basic Medical Procedures / First Aid	3	2	5	15	60	3	20	30	3	125
	Total	19	18	37	95	380		180	270		925

Third Year

S. N.	Subject	Mode		Weekly Hrs	Distribution of Marks						Total Marks
		T	P		Theory			Practical			
					Internal	Final	Time (Hrs)	Internal	Final	Time (Hrs)	
A.	Class (20 weeks)										
1	Basic Periodontology II	3	5	8	10	40	1.5	20	30	3	100
2	Food and Nutrition	3	2	5	10	40	1.5	10	15	3	75
3	Dental Pharmacology	3	3	6	10	40	1.5	10	15	3	75
4	Health Management	3	2	5	10	40	1.5	10	15	3	75
5	Dental Radiography and Photography	2	4	6	5	20	1.5	20	30	3	75
6	Dental Public Health and Jurisprudence	5	2	7	15	60	3	10	15	3	100
	Total	19	18	37	60	240		80	120		500
B.	Comprehensive Professional Field Practice (24 Weeks*40 hrs/week)				Internal Supervision		Internal Exam		External Exam		Total
	(a) Clinical	12 weeks			150		50		50		250
	(b) Community	12 weeks			150		50		50		250
					300		100		100		500

First Year

(Please see separate curriculum for General Health Science First Year all)

Second Year

Oral Anatomy & Physiology

Year: II

Theory: 2 hrs./week

Practical: 2 hrs./week

Full Marks: (Th. 50 + Pr. 50)

Pass Marks: (Th. 20 + Pr. 25)

Course Description:

The course orients the students to basic knowledge about oral anatomy and physiology. It begins with the introduction of various structures and systems of the head and neck, then focus on oral structures, specifically the teeth. The physiological processes that occur in the oral cavity are also taken into discussion, thus enabling the student to gain knowledge on functioning of the oral structures.

Objectives:

After completion of course the student will be able to:

1. Identify the structures of the head and neck specifically the oral structures and its function and implement the knowledge in their clinical application.
2. Review on facial muscles and describe muscles of mastication.
3. Identify and describe in detail the anatomy, growth and development of the tooth including sequence of eruption and tooth numbering.
4. Describe the physiology of the specific oral structures.
5. List the cranial nerves and discuss relevant ones in detail.

Unit 1: Introduction

[2]

Sub-unit 1: Definition and terminologies

1. Definition: Anatomy, Histology, Osteology, Embryology and Physiology
2. Concept of anatomical terminologies: mesial, distal, buccal, labial, lingual, palatal, occlusal, incisal, dorsal, ventral etc.

Unit 2: Skeleton system

[20]

Sub unit 1: Review of skeleton of head and neck

1. Definition bone, development of bone
2. Enumerate skeletons of cranium
3. Enumerate skeleton of vertebra with emphasis on cervical vertebra

Sub unit 2: Maxilla

1. Growth and Development of Maxilla
2. Structure and parts of maxilla
3. List the muscular attachment to the maxilla

Sub unit 3: Maxillary sinus

1. Anatomy and structure
2. Enumerate functions of maxillary sinus

Sub unit 4: Mandible

1. Growth Development of Mandible
2. Structure and parts of mandible
3. List the muscular attachment to the mandible

Unit 3: Muscular System

[15]

Sub unit 1: Review on muscles of facial expression

1. Enumerate facial muscles
2. List the functions of facial muscles

Sub unit 2: Muscles of mastication

1. Enumerate muscles of mastication
2. Origin, insertion and relation of muscles of mastication
3. Functions of muscles of mastication

Unit 4: Temporo-mandibular joint

[2]

1. Definition of T.M.J.
2. Structure of T.M.J. with diagram
3. Movements of T.M.J.

Unit 5: Oral cavity

[7]

1. various parts of oral cavity
2. Cheek, palate, floor of the mouth, vestibule, lips
3. Tongue: structure and muscles
4. Describe taste buds and functions of tongue

Unit 6: Periodontium

[10]

Sub unit 1: Gingiva

1. Gingiva and gingival sulcus
2. Structure and type of gingiva
3. Clinical feature of Gingiva

Sub unit 2: Periodontal ligament

1. Concept of periodontal ligament
2. Enumerate fibers of periodontal ligament
3. functions of periodontal ligament

Sub unit 3: Cementum

1. Concept of cementum
2. Enumerate types and functions of cementum

Sub unit 4: Alveolar bone

1. Concept of alveolar bone
2. Properties and functions of alveolar bone

Unit 7: Tooth

[8]

Sub unit 1: Growth and development of tooth

1. Concept of dental lamina & dental papilla
2. Describe tooth bud
3. Development of dentition and explain different stages of development

Sub unit 2: Anatomy of tooth

1. List and describe the morphological parts of tooth
2. List the structural parts of tooth
3. Write down eruption and exfoliation sequence
4. Difference between deciduous and permanent dentition

Sub unit 3: Occlusion

1. Definition of occlusion. Describe development of dentition
2. Definition of Malocclusion. Discuss the etiology, Angle's classification and consequences of Malocclusion

Sub unit 4: Tooth numbering system

1. Concept of different tooth numbering systems
2. Merits and demerits of Zsigmondy- palmer System, ADA (Universal) System, FDI System

Unit 8: Physiology of mastication & deglutition [5]

1. Definition: mastication, deglutition
2. Physiology of mastication, deglutition
3. Difference between infantile swallow and mature swallow

Unit 9: Salivary gland [4]**Sub unit 1:Major Salivary gland**

1. Structure, position of parotid gland
2. Structure, position of submandibular gland
3. Structure, position of sublingual gland

Sub unit 2: Saliva

1. Definition saliva
2. List types of saliva
3. Composition of saliva
4. Functions of saliva

Unit 10: Neurology [5]

1. Enumerate cranial nerves and their functions
2. Describe course, branches and functions of trigeminal nerve
3. Explain course, branches and functions of facial nerve

Practical exercises [78]**Unit 1: Skeleton system**

1. Identify skeleton of the head and neck
2. Identify maxilla and mandible with their parts & attachment

Unit 2: Muscular system

1. Identify facial muscles & muscles of mastication

Unit 3: T.M.J

1. Locate T.M.J.
2. Demonstrate movements of T.M.J

Unit 4: Oral cavity

1. Identify parts of oral cavity
2. Identify the location of taste buds

Unit 5: Growth & development of tooth

1. Identify different stages of development of dentition
2. Identify different types of malocclusion
3. Carry out dental age estimation

Unit 6: Anatomy of Tooth

1. Identify parts of tooth
2. Differentiate each tooth, deciduous and permanent
3. Draw diagrams of each tooth, deciduous and permanent
4. Perform wax carving of prototypes of permanent teeth

Unit 7: Periodontium

1. Locate different parts of Gingiva

References:

- Anatomy and physiology Ross and Wilson new edition
- Ash, Nelson Wheeler's Dental Anatomy, Physiology and Occlusion new Edition.
- Dental Anatomy Coloring Book by Margarer J
- Head, Neck & Dental Anatomy by Morjorie J Short
- Ten cate's oral histology
- Wheelers dental anatomy

Dental Materials, Instruments & Dental Assisting

Year: II

Theory: 2 hrs./week

Practical: 2 hrs./week

Full Marks: (Th. 50 + Pr. 50)

Pass Marks: (Th. 20 + Pr. 25)

Course Description:

The course aims to introduce and manipulate various dental materials used in dental practice. Identification of the various dental instruments is also taught to the students so as to facilitate in chair-side assisting to the dental surgeon in clinical setting.

Objectives:

At the end of the course students will be able to:

1. Identify, discuss and manipulate common dental materials
2. Identify common instruments used in dental practice
3. Describe basic maintenance of dental instruments and equipment in the dental operator
4. Assist a dental surgeon in carrying out dental procedures in clinical setting

Unit 1: Introduction & biological consideration of dental materials [6]

1. Enlist commonly used dental materials
2. Biological requirements of dental materials
3. Hazards from chemicals in dental materials
4. Importance of disinfection of dental materials
5. Requirement of shelf life and storage of dental materials

Unit 2: Gypsum Products [5]

1. Classification of gypsum products and its application in dentistry
2. Properties of gypsum products
3. Manipulation process of gypsum products
4. Calculation of recommended water powder ratio
5. Process of disinfection of gypsum materials

Unit 3: Impression materials [11]

Sub unit 1: Introduction

1. Definition of impression material
2. Classification of impression materials
3. Ideal properties of impression materials
4. Process of disinfection of impression materials
5. Process of transfer of impression materials
6. Process of storage of impression materials

Sub unit 2: Impression compound

1. Definition, classification & composition of impression compound
2. Ideal requirements of impression compound
3. Manipulation process of impression compound

Sub unit 3: Zinc oxide eugenol impression paste

1. Composition, setting reaction, properties, advantages and disadvantages
2. Manipulation process

Sub unit 4: Alginate

1. Definition and composition
2. Uses and types
3. Manipulation process
4. Process of loading alginate in the impression trays
5. Storage of alginate
6. Difference between alginate and agar

Sub unit 5: Elastomeric impression materials

1. Enumerate and classify elastomeric impression materials
2. Silicon based impression material and its manipulation
3. Storage of elastomeric impression materials
4. Advantages and Disadvantages

Unit 4: Composite resins**[2]**

1. Definition of composite resins and its uses
2. Enlist and explain types of composite resins
3. Technique of eye protection during light curing
4. Factors that affects properties of composite resins while handling, manipulation and curing

Unit 5: Dental amalgam**[2]**

1. Definition and classification
2. Composition
3. Manipulation process of amalgam
4. Mercury hazard and wastage disposal methods
5. Factors that affect properties of amalgam
6. Advantages and disadvantages

Unit 6: Dental cements and materials**[12]****Sub unit 1: Zinc oxide-eugenol**

1. Composition
2. Manipulation process
3. Advantages and disadvantages

Sub unit 2: Zinc phosphate

1. Composition
2. Manipulation process
3. Advantages and disadvantages

Sub unit 3: Glass ionomer

1. Classification of glass ionomer cement
2. Composition of glass ionomer cement
3. Manipulation process of glass ionomer cement
4. Advantages and Disadvantages

Sub unit 4: Zinc polycarboxylate

1. Composition
2. Manipulation process
3. Advantages and Disadvantages

Sub unit 5: Calcium hydroxide

1. Types of calcium hydroxide cement
2. Composition of calcium hydroxide cement
3. Manipulation process of calcium hydroxide cement
4. Advantages and Disadvantages

Sub unit 6: Acrylic resin

1. Definition
2. types and uses
3. composition
4. manipulation process
5. Advantages and Disadvantages

Unit 7: Cavity liners, bases and varnish**[5]**

1. Define Cavity liners, bases and varnish
2. Enlist different materials used as cavity liners, bases and varnish
3. Manipulation and storage
4. Advantages and Disadvantages

Unit 8: Dental waxes**[5]**

1. Definition, types and uses
2. Manipulation process of modeling wax
3. Advantages and disadvantages

Unit 9: Dental models, cast and die materials**[5]**

1. Definition: dental models, cast & die materials
2. Enlist different dental materials used for making model, cast & die
3. Manipulation process of dental plaster, dental stone and die stone
4. Laboratory process of pouring of cast
5. Laboratory process of base formation

Unit 10: Dental instruments**[5]****Sub Unit 1: Identification of instruments**

1. Classify dental instruments
2. Identification of common diagnostic, Periodontics, restorative, endodontic, pedodontics, prosthodontic, orthodontic and oral surgery instruments

Sub Unit 2: Impression Trays

1. Classify impression trays
2. Methods of sterilization of impression trays

Unit 11: Dental assisting**[10]****Sub unit 1: Dental chair**

1. Enlist and identify various parts of dental chair and their functions
2. Operation of dental chair units into various positions
3. Disinfection and maintenance of dental chair

Sub unit 2: Chair-side assisting

1. Various positions of the operator and the assistant
2. Various steps of patient preparation before operative procedure
3. Patient preparation in special situations including the case of child patient, handicapped patient, apprehensive patient, medically compromised patient, pregnant patient
4. Role of dental assisting in special situations including medical and dental emergencies
5. Post treatment instructions after various dental procedures
6. Concept of four handed and six handed dentistry

Sub unit 3: Saliva control and isolation

1. Enlist different methods of saliva control & isolation
2. use of suction machine for saliva control
3. application of rubber dam for isolation of tooth

Unit 12: Maintenance of dental equipment and instruments

[10]

Sub unit 1: Sterilization and disinfection of dental chair and instruments

1. Definition of sterilization and disinfection
2. Difference between sterilization and disinfection
3. Enlist different methods of sterilization and disinfection
4. Process of sterilization and disinfection of various dental chair and instruments

Sub unit 2: Maintenance and servicing of dental equipment

1. Describe air servicing of dental chair unit
2. Process of oiling/lubrication of dental chair unit and compressor
3. Process of oiling and storage of hand piece unit
4. Process of changing of cartridge of hand piece unit
5. Process of changing of bulb and cleaning of illumination panel
6. Process of changing of fuse wire of various electrical dental appliance

Sub unit 3: Dental waste disposal

1. Definition of waste disposal
2. Types of biological waste products in the dental operator
3. Mercury waste in the dental operator
4. Process of management of various biological and physical waste in the dental operator

Practical Exercises

[78]

UNIT 1: Instrument Identification

1. Identify Instruments used during Diagnostic procedure
2. Identify Instruments used during restorative procedure
3. Identify Instruments used during endodontic procedures
4. Identify Instruments used during Prosthodontic procedures
5. Identify Instruments used during surgical procedures
6. Identify Instruments used during Periodontics procedures
7. Identify Instruments used during orthodontic procedures
8. Identify Instruments used during Pedodontic procedures

UNIT 2:Gypsum Products

1. Identify different types of Gypsum Products
2. Manipulate and store Gypsum Products
3. Cast, models, dies fabrication

Unit 3: Inelastic Impression materials (Rigid)

1. Identify impression compound and zinc oxide eugenol paste
2. Manipulate and store impression compound and zinc oxide eugenol paste

Unit 4: Elastic Impression materials

1. Identify alginate
2. Manipulate and store alginate

Unit 5: Direct filling Resins

1. Identify different types of composite filling materials
2. Perform shade selection for composite Restoration

Unit 6: Dental amalgam

1. Identify dental amalgam
2. Manipulate amalgam for restoration
3. Manage dental mercury hazard and waste disposal methods

Unit 7: Dental cements

1. Identify different cements used for dental procedures
2. Manipulate and store different cements used for dental procedures

Unit 8: Cavity liners, bases and varnish

4. Identify materials used as Cavity liners, bases and varnish
5. Manipulate and store materials used as Cavity liners, bases and varnish

Unit 9: Dental waxes

1. Identify different waxes and their uses

Unit 10: Instruments

1. Identify different trays used for denture fabrication

Unit 11: Provisional restoration

1. Identify material used for fabrication of Provisional restoration
2. Fabrication of temporary crown in lab

Unit 12: Isolation, Sterilization and Maintenance

1. Identify retraction cord, rubber dam and saliva ejectors
2. Prepare cotton rolls, gauge pack and cotton pellet
3. Identify different materials used in disinfection and sterilization
4. Demonstrate different methods of sterilization and disinfection of instruments
5. visit sterilization unit of hospital

Unit 13: Dental Assisting

1. Identify different part of dental chairs and list its functions
2. Assist dental surgeon during different dental procedures

References:

- Basic Dental materials. John Mannapalil, Jaypee Brothers
- Carmen Scheller-Sheridan. The Basic Guide to Dental Instruments 2nd Edition
- Carmen Scheller-Sheridan. The Basic Guide to Dental Materials. 2013
- Craig, Robert G., Powers, John M., Wataha, John C., Dental Materials Properties and Manipulation process Eight Edition.
- Linda Bartolomucci Boyd, Dental Instruments: A Pocket Guide, 5th Edition
- Manappallil, John J., Basic Dental Materials new Edition
- Phillip's science of Dental materials, new edition Anusavice, Elsevier.
- Textbook of prosthodontics, Nallaswamy, Jaypee, New Delhi

BASIC PERIODONTOLOGY 1

Year: II

Theory: 4 hrs. /week

Practical: 4 hrs. /week

Full Marks: (Th. 100 + Pr. 100)

Pass Marks: (Th. 40 + Pr. 50)

Course Description

The course introduces the students to basic knowledge and skill necessary to use plaque control measures on patients; educate and motivate them for maintaining oral Science. It teaches the students to identify and use of periodontal instruments for scaling, and maintenance of periodontal instruments, then refer the conditions which require specialized dental care.

Objectives:

On completion of the course the learner will be able to:

1. Acquire knowledge and skill to perform various plaque control methods and use of oral Science aids on patients in clinical setting and in the community
2. Describe periodontal health, and determinants of periodontal disease
3. Record various gingival and periodontal indices
4. Identify and use periodontal instruments with manual dexterity
5. Perform dental scaling using manual and ultra sonic instruments
6. Maintenance of periodontal instruments
7. Refer the patients who require further treatment

Unit 1: Introduction:

[8]

1. Definition of Periodontology/Periodontics
2. Describe Periodontium
3. Historical background of Periodontology
4. Scope of Periodontics

Unit 2: Normal Periodontium

[35]

Sub unit 1: Gingiva

1. Definition of gingiva
2. Normal clinical features of gingiva
3. Normal microscopic features of gingiva
4. Gingival connective tissue & gingival fibres with illustrations
5. Development of gingival sulcus
6. Renewal of gingival epithelium
7. Blood supply, lymphatic drainage and nerve supply of gingiva
8. Correlation of normal clinical and microscopic features of gingiva

Sub unit 2: Periodontal ligament

1. Definition of periodontal ligament
2. Enlist periodontal ligament fibers with illustrations
3. Various cellular elements & ground substance
4. Functions of periodontal ligament

Sub unit 3: Cementum

1. Concept of cementum and its structure

2. Classification and types of cementum
3. Cemento-enamel junction
4. Thickness of cementum
5. Cementum resorption and repair
6. Ankylosis

Sub unit 4: Alveolar process

1. Definition and structure of alveolar process
2. Cells, intercellular matrix
3. Bone marrow, periosteum and endosteum in alveolar process
4. Socket wall, interdental septum
5. Normal osseous topography of alveolar bone
6. Fenestration and dehiscence
7. Remodeling of alveolar bone
8. Physiologic migration of the teeth
9. Occlusal forces and the periodontium
10. Blood supply, venous & lymphatic drainage

Sub unit 5: Defense mechanism in periodontal health

1. Role of epithelium
2. Gingival crevicular fluid in defense mechanism of oral cavity
3. Role of saliva and its function

Unit 3: Classification and epidemiology of periodontal disease

[20]

Sub unit 1: Classification of periodontal disease

1. Classify gingival and periodontal diseases as described in World Workshop on Periodontal Health 1999
2. Advantage and limitations of World Workshop classification

Sub unit 2: Epidemiology of periodontal disease

1. Definition: Epidemiology, prevalence, incidence, index
2. Discuss epidemiology of periodontal disease
3. Discuss prevalence and incidence of periodontal disease
4. Enlist indices used in periodontics
5. Describe Periodontal index
6. Describe Gingival index
7. Describe Oral Hygiene index
8. Describe CPITN
9. Describe plaque index

Unit 4: Etiology of periodontal disease

[33]

Sub unit 1: Dental plaque

1. Definition of dental plaque
2. Structure and composition of dental plaque
3. Formation of dental plaque
4. Structure and physiologic properties of dental plaque
5. Role of dental plaque in periodontal disease

Sub unit 2: Periodontal microbiology

1. Microbiology of dental plaque
2. Association of plaque microorganisms with periodontal disease
3. Microbial specificity of periodontal disease

4. Criteria for identification of periodontal pathogens
5. Virulence factor of periodontal pathogens
6. Colonization and invasion of periodontal tissues
7. Mechanism of host tissue damage

Sub unit 3: Host response

1. Mechanism of inflammatory cell response
2. Role of mast cells, neutrophils, macrophages, lymphocytes, plasma cells
3. Role of antibody, complement, cytokines and immune mechanisms

Sub unit 4: Dental calculus

1. Definition and classification of dental calculus
2. Composition of dental calculus
3. Mechanism of formation of dental calculus
4. Mechanism of attachment of calculus to tooth surface
5. Theories regarding the mineralization of calculus
6. Etiologic significance of dental calculus

Sub unit 5: Local deposits and its role in oral Science

1. Describe materia alba
2. Describe dental stain
3. Describe food debris

Sub unit 6: Role of iatrogenic factors

1. Role of margin of restoration, contact point, surface roughness, overhanging restoration, tooth contours
2. Role faulty dental materials and design of dentures
3. Periodontal problems associated with faulty orthodontic treatment

Sub unit 7: Effects of local factors

1. Effects of unreplaced missing teeth
2. Effects of mouth breathing
3. Effects of tongue thrusting
4. Effects of bruxism
5. Effects of tooth brush trauma
6. Effects of chemical irritation
7. Effects of radiation

Sub unit 8: Influence of systemic disease on oral health

1. Influence of nutritional deficiencies on periodontium
2. Influence of endocrine disease on periodontium
3. Influence of hematological disease on periodontium
4. Influence of immunological disorders on periodontium
5. Influence of cardiovascular disease on periodontium
6. Influence of psychosomatic disorder on periodontium

Sub unit 9: AIDS and periodontium

1. Oral and periodontal manifestations of HIV infection
2. Oral hairy leukoplakia
3. Oral candidiasis
4. Kaposi sarcoma
5. Bacillary angiomatosis
6. Oral hyperpigmentation
7. Atypical ulcers and delayed healing
8. HIV gingivitis and periodontitis

Sub unit 10: Age changes in Periodontium

1. General effects of aging
2. Ageing related changes in the periodontium
3. Masticatory efficiency in aging
4. Ageing and cumulative effects of oral disease

Unit 5: Plaque Control**[30]****Sub unit 1: Introduction**

1. Importance of oral hygiene and its effect on general health
2. Plaque control measures and its significance
3. Classification of plaque control methods
4. Personal oral hygiene methods
5. Importance of patient education on plaque control
6. Use of disclosing agents

Sub unit 2: Tooth brush & Dentifrice

1. Concept and types of tooth brush
2. Use of powdered tooth brush
3. Dentifrices and its composition
4. Composition & mechanism of action of fluoridated toothpastes
5. Composition & mechanism of action of desensitizing toothpastes
6. Various types of tooth brushing methods and their significance in different patients

Sub unit 3: Inter-dental cleaning aids

1. Use of toothpick
2. Use of dental floss
3. Use of inter-dental brushes, ortho brushes
4. Use of gum massage/gum stimulator

Sub unit 4: Chemical plaque control methods

1. Describe and classify various chemical plaque control agents
2. Mechanism of action of various plaque control agents

Sub unit 5: Oral irrigation device

1. Use of oral irrigation device
2. Use of periodontal pocket irrigation
3. Use of home irrigation devices
4. Instruments and medicaments used in oral irrigation

Unit 6: Periodontal Instruments & Instrumentation**[30]****Sub unit 1: Periodontal instruments**

1. Describe instrument design and classification
2. Describe various diagnostic instruments
3. Describe various manual periodontal instruments
4. Describe various scalers, curettes and root planing instruments
5. Describe sonic, ultrasonic & piezo-electric scalers

Sub unit 2: Principles of instrumentation

1. Describe anatomic descriptions and considerations during periodontal instrumentation
2. Describe patient and operator position
3. Describe instrument grasp
4. Describe establishing finger rests
5. Describe instrument angulations, activation and adaptation

6. Describe various strokes of using manual instruments

Sub unit 3: Instrument sharpening

1. Principles and objective of sharpening
2. Various sharpening stones and material
3. Sharpening of manual periodontal instruments

Practical Exercises

[156]

Unit 1: Normal Periodontium

1. Locate gingiva and its normal features
2. Locate gingival sulcus
3. Draw well labeled diagram of gingival fibers
4. Identify gingivitis
5. Identify gingival recession
6. Draw well labeled diagram of periodontium

Unit 2: Classification and epidemiology of periodontal disease

1. Calculate Periodontal index in a patient
2. Calculate Gingival index in a patient
3. Calculate simplified Oral hygiene index in a patient
4. Calculate CPITN index in a patient
5. Calculate plaque index in a patient

Unit 3: Etiology of periodontal disease

1. Identify dental plaque using disclosing agent
2. Identify dental calculus in a patient
3. Identify dental stain in a patient
4. Identify food debris in a patient

Unit 4: Plaque Control

1. Demonstrate personal oral hygiene methods
2. Perform patient education on plaque control
3. Demonstrate the use of disclosing agents

Sub unit 1: Tooth brush & Dentifrice

1. Demonstrate various methods of tooth brushing
2. Demonstrate the use of powered tooth brush
3. Demonstrate the method of preparing dentifrice

Sub unit 2: Inter-dental cleaning aids

1. Demonstrate the use of toothpick
2. Demonstrate the use of dental floss
3. Demonstrate the use of inter-dental brushes
4. Demonstrate the use of gum massage / gum stimulator
5. Demonstrate the use of various chemical plaque control agents

Sub unit 3: Oral irrigation device

1. Demonstrate the use of oral irrigation device
2. Demonstrate the periodontal pocket irrigation
3. Demonstrate the use of home irrigation devices

Unit 5: Periodontal Instruments & Instrumentation

Sub unit 1: Principles of instruments

1. Identify various diagnostic instruments
2. Identify various manual periodontal instruments including hoe, files
3. Demonstrate the use of various scalers
4. Demonstrate the use of sonic and ultrasonic scalers

Sub unit 2: Principles of instrumentation

1. Demonstrate patient and operator position in principles of periodontal instrumentation
2. Demonstrate instrument grasp
3. Demonstrate establishing finger rests
4. Demonstrate instrument angulations, activation and adaptation
5. Demonstrate various strokes of using manual instruments

Sub unit 3: Instrument sharpening

1. Identify various sharpening stones and materials
2. Demonstrate sharpening of manual periodontal instruments

References:

- Glickman's Clinical Periodontology-Carranza
- Clinical Periodontology Implant Dentistry Fifth edition 1997
- Text book of Clinical Periodontology Jan Lindhe
- Fundamentals of Periodontology Jill and Nield

Oral Pathology & Microbiology

Year: II

Theory: 3 hrs/week

Practical: 2 hrs/week

Full Marks: (Th. 75 + Pr. 50)

Pass Marks: (Th. 30 + Pr. 25)

Course Description:

This course aims to introduce, describe and familiarize students with the various common pathological conditions related to the oral cavity so that early diagnosis is facilitated and appropriate referral is done. Adequate knowledge on common diseases, infections, their etiology and related microbiology is given due emphasis. Sterilization to prevent diseases and infection control in dental operatory is also taught to the students.

Objectives:

After Completion of course the student will be able to:

1. Identify common oral diseases that affect the oral cavity.
2. Note suspicious pathological conditions presented for further referral.
3. Describe microorganisms and how they contribute to the disease process.
4. Explain sterilization and infection control measures that need to be considered to maintain an aseptic clinical setting.

Unit 1: Oral Pathology

[70]

Sub unit 1: Introduction

1. Definition of pathology
2. Concept of disease
3. Etiology and pathogenesis of disease
4. Disease process
5. Definition: atrophy, hypertrophy, cell injury, cell death, ulcer, regeneration, necrosis, dysplasia, metaplasia, abfraction

Sub unit 2: Inflammation

1. Definition of inflammation
2. Causes and types of inflammation
3. Clinical features of inflammation
4. Enumerate and explain cardinal signs of inflammation

Sub unit 3: Abscess

1. Definition of Abscess
2. Causes of abscess
3. Types of abscess
4. Clinical features of abscess
5. Describe dento-alveolar abscess
6. Describe periodontal abscess

Sub unit 4: Space infection

1. Definition of Space and enumerate spaces of oro-facial region
2. Describe cellulitis
3. Enumerate common dental space infections
4. Ludwig's angina

Sub unit 5: Cysts

1. Definition of cyst
2. Classification and enumerate common cystic lesions of the oral cavity
3. Describe odontogenic cysts

Sub unit 6: Tumors

1. Definition of Tumor
2. Classification of tumors
3. Difference between benign and malignant tumors
4. Enumerate common maxillofacial tumors
5. Mode of spread of tumors
6. Difference between odontogenic & non-odontogenic tumors

Sub unit 7: Developmental anomalies

1. Explain development anomalies of tooth
2. Explain development anomalies of oral structures
3. Describe and classify cleft lip and palate
4. Causes of cleft lip and palate

Sub unit 8: Regressive alteration of tooth

1. Definition of Attrition
2. Causes & clinical feature of attrition
3. Definition of Abrasion
4. Causes & clinical of feature of abrasion
5. Definition of Erosion
6. Causes & clinical feature of erosion

Sub unit 9: Dental Caries

1. Definition of dental caries
2. Etiology and clinical feature of dental Caries
3. Sequelae of dental caries
4. Prevention of dental caries

Sub unit 10: Diseases of pulp and periapical tissues

1. Classification of diseases of pulp

Sub unit 11: Oral Lesion and Conditions

1. Common oral ulcerations affecting oral cavity
2. Common oral lesions affecting oral cavity
3. Common viral lesions affecting oral cavity
4. Common vesiculo-bulous lesions affecting oral cavity
5. Enumerate and explain various precancerous lesions and conditions

Sub unit 12: Systemic diseases and their oral manifestations

1. Oral manifestations of diabetes mellitus
2. Oral manifestations of leukemia, anemia
3. Oral manifestations of syphilis, tuberculosis, AIDS
4. Candidiasis and oral thrush
5. Hepatitis and its types
6. HIV/AIDS, its prevention, pathogenesis mode of infection and oral manifestations

7. Definition infective endocarditis, list down risk factors
8. Clinical features & prophylaxis of infective endocarditis

Unit 2: Microbiology

[6]

1. Definition of Microbiology
2. Scope and branches of microbiology
3. Contributions of Louis Pasteur, Robert Koch and Socransky
4. Draw well labeled diagram of simple & compound microscope

Unit 3: Micro-organisms

[10]

Sub unit 1: Introduction

1. Describe Bacteria with diagram
2. Describe Virus with diagram
3. Describe Fungi with diagram
4. Describe Protozoa with diagram
5. Describe Amoeba with diagram
6. Describe Helminthes with diagram

Sub unit 2: Morphology and structure of micro-organisms

1. Morphological form and structure of bacteria
2. Spore and capsule of bacteria
3. Morphology & structure of virus

Sub unit 3: Growth and multiplication of bacteria

1. Concept of growth and multiplication of bacteria
2. Factors affecting growth of bacteria
3. Cultivation of microbes
4. Short notes on culture media

Unit 4: Infection

[4]

1. Definition of infection
2. Sources and types of infection

Unit 5: Oral Microbiology

[10]

1. Concept of oral microbiology
2. Normal oral flora of human being from birth to old age
3. Micro-organisms in relation to dental caries
4. Micro-organisms in relation to periodontal disease
5. Enumerate microorganisms causing contamination and disease related to dentistry

Unit 6: Sterilization

[10]

Sub unit 1: Infection control

1. Definition of infection control
2. Various levels of infection control
3. Definition of sterilization
4. Definition of disinfection
5. Concept of antiseptic and asepsis with example

Sub unit 2: Universal precaution

1. Definition of universal precaution
2. Procedures followed in universal precaution

Sub unit 3: Self protection

1. Self protection in operatory

Process of wearing face mask, gloves and gowns with their clinical significance

Sub unit 4: Hand washing

1. Process of simple hand washing
2. Process of hand scrubbing in operatory with their significance

Sub unit 5: Decontamination

1. Process of decontamination of gloves, linens and surgical drapes

Process of decontamination of dental equipment and instruments including dental chair, hand

Sub unit 6: Different methods of Sterilization

1. Classify and explain different methods of sterilization
2. Physical methods of sterilization including dry heat, moist heat, gas, vapor and radiation sterilization
3. Describe boiling and autoclaving methods of sterilization
4. Chemical methods of sterilization including alcohol, glutaraldehyde and chlorine compounds
5. Fumigation procedure
6. Safety factors
2. Piece, suction apparatus, x- ray films etc.

Unit 7: Clinical and hospital waste management

[7]

1. Concept of clinical and hospital waste
2. Types of waste management
3. Clinical wastes of dental operatory
4. Procedure of waste management of dental operatory
5. Dental amalgam waste management

Practical

[78]

Unit 1: Oral Pathology**Sub unit 1: Introduction of pathology**

1. Write diseases cycle and terminologies with figure

Sub unit 2: Tumors

1. Identify Benign and Malignant Tumors (slides)

Sub unit 3: Developmental anomalies

1. Identify Development anomalies of Tooth (Specimen)
2. Identify Development anomalies of oral structures (Specimen)
3. Identify Cleft lip and palate (Clinical Photographs)

Sub unit 4: Regressive alteration of tooth

1. Identify attrition, abrasion and erosion

Sub unit 5: Dental Caries

1. Write the stages of Dental Caries
2. Dental caries triangle

Sub unit 6: Oral Lesion and Conditions

1. Identify Oral Cancer (Slides and clinical Photographs)
2. Identify Precancerous lesion and conditions

Unit2: Oral Microbiology

Sub unit 1: Introduction

1. Draw well labeled diagram of microscope

Sub unit 2: Brief knowledge on Micro-organisms

1. Handling of Compound Microscope

Sub unit 3: Morphology and Structure of Bacteria

1. Study of Morphological form and Structure of Bacteria
2. Study of Spore and Capsule of Bacteria

Unit 3: Sterilization

Sub unit 1: Personal Protective equipment

1. Demonstrate wearing of face mask, gloves, goggles and gowns

Sub unit 2: Process of Scrubbing Hands in Operatory

2. Demonstrate simple hand washing process
3. Demonstrate Scrubbing of hands for operatory

Sub unit 3: Basic skills on

1. Handling of autoclave
2. Preparation of Alcohol, gluteraldehyde and chlorine solutions

Sub unit 4: Different methods of Sterilization

1. Identify and demonstrate working of boiler, Hot air oven

References:

1. Ananthanarayan and Paniker's (2009), Text book of Microbiology, Universities Press.
2. C P Baveja (2003)Textbook of Microbiology for Dental Student, Arya Publication
3. Dr. Chandra Prakash Bhatt, (2011) Practical Medical Microbiology, A.K books & Education Enterprises.
4. P. Chakraborty (2005), Text book of Microbiology, New central book agency (P) Ltd.
5. R.C. Dubey (2002), Practical Microbiology, S. Chand & Company Ltd.
- 6.

Health Education

Year: II

Theory: 1 hr/week

Practical: 2 hrs/week

Full Marks: (Th. 25 + Pr. 50)

Pass Marks: (Th. 10 + Pr. 25)

Course Description:

The course teaches the educational aspects of public health management, which is an indispensable component for preventive health. The course teaches the concepts and theories of health behaviors and the procedure for planning, implementation and overall management of health education program. The aim of this course is to develop the necessary skills for effective application of health education at the community level.

Objectives:

Upon completion of the course the learner will be able to:

1. Appreciate the significance of health education in preventive, promotive, curative and rehabilitative health care.
2. Identify and apply the theories and principles of health behavioral sciences in the process of health education.
3. Identify, select and utilize suitable health education methods and media for successful implementation of health service programs.
4. Plan, implement and evaluate health education programs.

Unit: 1. Introduction to Health Education

[7]

Sub-unit: 1 Overview of health education

1. Definition of Health
2. Health disease spectrum
3. Factors influencing health
4. Definition of Health Education
5. Aims/purposes of health education
6. Significance of health education in promotive, preventive curative and rehabilitative aspects of health education
7. Scope and principles of health education

Unit: 2 Fundamental Factors of Health Education

[10]

Sub-unit 1: Motivation

1. Theories and principles of motivation in the process of health education.
2. Intrinsic and extrinsic motivation.
3. Maslow theory of motivation
4. Kurt lewin's force field theory
5. Cognitive Theory
6. Drive or Homeostatic Theory or Push theory

Sub-unit 2: Learning

1. Theories of learning
2. Kurt Lewin's Theory of Learning

3. Factors influencing learning.

Unit: 3 Methods of Health Education

[6]

Sub-unit 1: Methods overview

1. Health education methods like mass method, group method and individual method
2. Advantages and disadvantages of the different types of health education methods.

Sub-unit 2: Mass group methods

1. Classification of media according to audio aid, video aid and audio visual aid
2. Advantages and disadvantages of each method.
3. Selection of appropriate method.

Unit: 4. Planning of Health Education Programmes

[6]

Sub-unit 1: Principles of planning

1. Importance of planning in health education programmes.
2. Process of planning and preparation of lesson plan
3. Strategies for implementation of health education program
 - Building commitment
 - Training of workforce
 - Mobilizing resources
 - Organizing community
 - Monitoring of the program.
 - Supervision of health education workers
 - Recording and reporting
4. Planning of health education program in a community setting
5. Preparation of lesson plan for conduction of oral health education program.
6. Planning implementation and evaluation of oral health program in different setting like hospital, health post, community.
7. Preparation of supervision checklist for health education program

Unit: 6. Evaluation of Health Education Programmes

[10]

1. Concept of adequacy, relevancy, and efficacy of an educational program.
2. Methods of program evaluation
3. Advantages and disadvantages of each method of evaluation.

Practical

[78]

Conduct a health education program with these materials and tools in group activities.

1. Conduct a survey in a community/ school to identify the health education problems/ needs
2. Prepare a survey form to collect data
3. prepare a priority matrix on the basis of collected data
4. Develop the overall and specific objectives of program on the basis of SMART characteristics
5. Make a list of actions verbs to develop the objectives related to knowledge, attitude and skills development

6. Prepare a lesson and session plan for health education program
7. Prepare a facilitator notes on the basis of contents to be taught
8. Prepare a resources collection tools to conduct the program
9. Prepare two evaluation tools , one for program evaluation and one for contents evaluation for each topic
10. Conduct a health education program on the basis of planning
11. Prepare a training plan and organize a training program for the health education program conducting team
12. Prepare a budget sheet for the program
13. Create a organizing committee with full participation of community people.
14. Conduct meeting and prepare a minutes for each and every meetings
15. Prepare a monitoring check list for program monitoring and conduct monitoring
16. Prepare a supervision tool and conduct supervision
17. Prepare a report of health education implementation
18. Final submit the health education program planning and implementation reports.
19. Preparation of different method and media like flash card , flip chart and other media
20. Planning of health education program in a community setting
21. Preparation of lesson plan for conduction of oral health education program.
22. Planning implementation and evaluation of oral health program in different setting like hospital, health post, community.
23. Demonstration, role play, group discussion, workshop and symposium, panel discussion.
24. prepare a poster flip chart, flash cards, flannel board, striptease chart, pamphlet, bulletin board with bulletin
25. Collect different newspaper, magazines, journal related to oral and general health.

References:

- Essential preventive Medicine by OP Gahyui Piyush Gupta Published by Vikas Publishing house India Current edition
- Park, J.E. and Park, K., Textbook of Social and Preventive Medicine, new edition.
- Park's textbooks of Preventive and Social Medicine by K park published by M/S Banarasidas Bhonot, Tabalpur India current edition
- Pradhan, H.B., A textbook of Health Education. Educational Resources for Health, 1995.

Epidemiology and Community Diagnosis

Year: II

Theory: 2 hrs/week

Practical: 2 hrs/week

Full Marks: (Th. 50 + Pr. 50)

Pass Marks: (Th. 20 + Pr. 25)

Course Description:

This foundational course of community health practice is designed to develop the competencies and attitudes for application of epidemiological principles in community health diagnosis and health care practices.

Objectives:

On completion of the course the student will be able to:

1. Describe disease causation and modes of transmission, identifying the agent, host, and environmental factors, as the basis for environmental health of the community.
2. Use epidemiology to identify health problems of the community.
3. Investigate and manage an epidemic outbreak in the community.
4. Conduct a community diagnosis.
5. Describe the various health practices among the diverse ethnic groups of Nepal.

Unit: 1. Basic Epidemiology

[30]

Sub-unit 1: Concepts of Disease

1. Concept of disease
2. Spectrum of disease with examples.
3. "Iceberg phenomenon" of disease.
4. Concepts of disease causation:
 - "epidemiological triad" concept of disease causation
 - Definition of terms: agent, host and environment.
 - Examples of common agent, host & environmental, factors.
 - Concept of "web of causations."
 - Risk factors & risk groups.
 - Illustrate risk factors & risk groups in relation with particular diseases.
5. Basic natural history of disease.
6. Concept of disease control, elimination, eradications & surveillance.
7. Name of diseases/health problems that are under the control, elimination, eradication and surveillance of HMG's current health program.

Sub-unit 2: Concepts and method of epidemiology

1. Concept, scope and purpose of epidemiology.
2. Overview of tools (rate, ratio, proportion) and common measurements (eg. mortality, morbidity, disability, determinants of health i.e. health related factors) used in an epidemiological study.
3. Types of epidemiology:
4. Screening for disease:

- Concept of screening.
 - List the pre-requisites of a screening test.
5. List the names of common diseases, target populations and tests used for screening.
 6. Characteristic features of different types of infectious disease epidemics.
 7. Steps/process of investigation and management of an infectious disease epidemic.
 8. Use an example to illustrate the process of investigation and management of an infectious disease epidemic.
 9. Describe common disease prevalent in Nepal

Sub-unit 3: Infections disease epidemiology

1. Definition of terms: infection and infectious disease, epidemic, endemic, sporadic, pandemic, exotic, opportunistic infection, source of infection, reservoir of infection, iatrogenic infection.
2. Dynamics of disease transmission.
 - Outline the transmission cycle of disease (chain of infection)
 - The term "reservoir" in terms of human reservoir in non-living things.
 - Difference between direct and indirect modes of transmission; give examples of diseases for each.
 - The terms "incubation period" and "period of communicability" in relation to a susceptible host.
 - Incubation period and communicable period of common diseases.
3. Infectious disease prevention and control:
 - Methods for controlling the reservoir, interruption of transmission and protecting the susceptible host.
 - Method of control with relationship to a specific disease.

Unit 2: Community Diagnosis

[30]

Sub-unit 1: Introduction to Community Diagnosis

1. Concept community diagnosis.
2. Benefits of using the community diagnosis process.
3. Objectives of performing a community diagnosis.
4. Steps of the community diagnosis process.
5. Components of a community diagnosis, using a realistic example.
6. Difference between community diagnosis and clinical diagnosis.
7. Method of preparation of tool for community diagnosis like questionnaire methods, Observation method, Interview method.
8. Micro health planning or project for community diagnosis
9. Health needs assessment: a. felt health needs b. observed health needs c. real health needs
10. Principles of needs assessment
11. Introductions of a micro health project.
12. Steps of a MHP:
 - planning
 - implementation
 - evaluation of the MHP

Sub-unit 2: Data collection

1. Concept and types of data
2. Difference between primary and secondary data and their sources.

3. Give examples of primary and secondary sources.
4. Differentiate between quantitative and qualitative data, using examples.
5. Purposes of census and sample surveys.
6. Methods of sampling/sampling methods and significance of sample size.
7. Prepare, pre-test and rewrite a survey instrument.

Sub-unit 3: Data processing

1. Steps of data processing.
2. Data processing to a community diagnosis project in your field practice.

Sub-unit 4: Community presentation

1. Aims and goals of the community presentation of a community diagnosis.
2. Community presentation.
3. Steps of a community presentation.

Sub-unit 5: Report writing

1. Aims and benefits of project reports.
2. Components of a project report.

Unit 3: Biostatistics and Dental Science

[18]

Sub-unit 1: Introduce to Biostatistics and Dental Science

1. Biostatistics and dental science
2. concept of statistics and its uses in dental science
3. data, its classification and sources
4. means of data collection and methods of obtaining primary data
5. sampling and two basic ways of sample selection
6. sample size and errors in sampling
7. data presentation methods
8. measures of central tendency
9. measures of dispersion
10. taste of significance

Practical:

[78]

- Visit different local institutions
- Collect data
- Provide gender friendly services
- Provide oral health program for the family/community
- Collection of information about family
- Maintain interpersonal relationship
- Community diagnosis
 - Select 5 families for community survey in different area
 - Collect the data by using prescribed survey format
 - Analyze data for statistical presentation
- Carry out health action by
 - Setting objectives
 - Planning and implementing
- Community level health action of one selected problem in community setting
- Prepare and present report

References:

- Park, K. Park's Textbook of Preventive and Social Medicine. M/S Banarasidas Bhanot, Jabalpur, India. Current edition.
- Parker, D.J.P., Practical Epidemiology. ELBS Publications. Current edition.
- Essential Preventive Medicine, by O.P. Ghai, Piyush Gupta. Vikas Publishing House, India. Current edition.
- Basic Epidemiology. WHO publication.

Environmental Health

Year: II

Theory: 2 hrs/week

Practical: 2 hrs/week

Full Marks: (Th. 50 + Pr. 50)

Pass Marks: (Th. 20 + Pr. 25)

Course Description:

This course introduces the student to the specialized skill and knowledge needed to provide environmental health services. The content is taught using classroom instruction and practical experiences in community based programmes and primary health care services during field practice at the Health Post and home visits. This course includes information about the relationship between environment and health, water resource management and conservation, waste management, food Science, healthful and sanitary housing, air quality management, control of rodents, arthropods and insects, and occupational health.

Objectives:

At the end of the course, the learner will be able to:

1. Describe the relationship between the environment and health, and show the impact of environment on health.
2. Describe water resources conservation and water quality management.
3. Explain proper waste management in urban and in rural areas.
4. Describe how to maintain food Science.
5. Describe standards of safe housing and effects of poor housing.
6. Explain air pollution and its management.
7. Describe methods of controlling rodents, arthropods and insect.
8. Identify occupational diseases and strategies for their prevention.

Unit: 1. Environmental Health Concepts

[20]

Sub-unit 1: Terminology

- Environment
 - Environmental Health
 - Environmental Sanitation
 - Environmental Pollution
1. Condition of environmental health of your community.
 2. Environmental sanitation efforts in Nepal.
 3. Local, national, and global pollution.
 4. Improvement practice of environmental health of your community.

Sub-unit 2: Relation of Environmental Health

1. Relationship between environment and health.
2. Agent, host and environment.
3. Common disease caused by change in land use, population migration, or environment in Nepal.

Sub-unit 3: Environmental hazards and effects

1. Introduction of environmental hazards and give examples.
2. Difference between biological and chemical hazards.
3. Long term and short term effects of selected biological and chemical hazards.
4. Different types of environmental hazards and suggest ways to reduce the harmful effects of environmental hazards.

Sub-unit 4: Basic environmental threats

1. Concept of basic environmental threats in Nepal
2. Different types of environmental threats.
3. Measures to reduce one of these threats, as a health post manager.

Unit: 2. Water**[20]****Sub-unit 1: Introduction of Water**

- १। Concept of value requirement, nature and cycle of water
- २। Concept of safe and wholesome water
- ३। uses of water

Sub-unit 2: Source of water

1. various sources of water
2. Merits & demerits of different sources.
3. Relationship between deforestation and water shortages in Nepal.
4. Relationship among water shortages with quality of life and health.
5. Prevention for water shortages.

Sub-unit 3: Water pollution

1. Concept of water pollution
2. Causes of water pollution
3. prevention of water pollution
4. water borne diseases and their examples

Sub-unit 4: Purification of water

1. Different ways to achieve water purification.
2. Different methods of water purification at the household level.
3. Process of disinfection well water.
4. Methods of water purification on a large scale.
5. features of a sanitary well

Sub-unit 5: Water quality

1. Criteria and standards for water quality according to WHO and the Ministry of Health.
 - physical quality
 - chemical quality
 - biological quality

Unit: 3. Waste**[10]****Sub-unit 1: Introduction of waste**

1. Introduction of waste
2. Give examples of solid waste and identify their sources.
3. Give examples of liquid wastes and identify their sources.
4. Give examples of hazardous wastes and identify their sources.

-unit 2: Solid waste

1. Concept of biodegradable and non-biodegradable solid wastes in Nepal.
2. National efforts to reduce the amount of non-biodegradable wastes.
3. National and local efforts to introduce recycling of solid wastes.
4. Reduce solid waste problems.

Sub-unit 3: waste Management

1. Concept of 3R to minimizing waste
2. Disposal of waste in urban areas in Nepal and other countries.
3. Purposes and effectiveness of Nepal's anti-litter campaign.
4. Disposal of waste in rural areas.
5. Advantages and disadvantages of each method of solid waste disposal.
6. Liquid waste management
7. Components of liquid waste.
8. Sources of liquid waste.
9. Management of liquid waste in household (small scale) & urban areas.
10. Liquid waste disposal method.
11. Liquid waste management in household, industrial and urban areas of Nepal
12. Advantages and disadvantages of different methods of liquid and waste management.

Sub-unit 4: Hazards of solid waste

1. Concept of health hazards and environmental hazards created by solid waste mismanagement.
2. health problems caused by solid waste mismanagement

Sub-unit 5: Health Care Waste Management

Waste :

- Definition
 - Types
1. Health Care Waste
 - Definition
 - Types
 - Categories and Segregation of HCW
 2. Impact of Health Care Waste on Environment and Public Health
 3. Risk related to Health Care Waste
 - Overview of Hazard
 - Types of Hazard
 - Person at Hazard
 - Hazard from different types of Health Care Waste
 4. WASH
 - Introduction
 - Water
 - a. Requirement of water
 - b. Parameters of safe drinking water
 - Sanitation

- a. Requirement of sanitation
 - b. Access and functionality of sanitation
- Hygiene
 - a. Hand washing
 - b. Use of gloves

Unit: 4. Food Science

[10]

Sub-unit 1: Concept of food Science

1. Concept of food Science.
2. Importance/ application of food Science.
3. Different food Science methods.
4. Rules for food handling, which ensure sanitary, hygienic conditions of eating-places.
5. Concept of meat hygiene

Sub-unit 2: Food borne disease

1. Incidence of food poisoning.
2. Common food borne diseases.
3. Identification of foods, which carry a high risk of containing toxins.
4. Difference between food borne infections and bacterial food poisoning.

Sub-unit 3: Sources of food contamination.

1. Concept of food contamination.
2. Sources of food contamination.

Sub-unit 4: Food Preservation.

1. Concept of food preservation
2. Purpose of food preservation.
3. Different methods of food preservation.

Sub-unit 5: Food additives, food fortification and food adulteration.

1. Concept of food fortification.
2. Importance/ application of food fortification.
3. Different food fortification practices in Nepal.
4. Food additives and describe different types of food additives.
5. Hazards of using food additives.
6. Food adulteration and discuss its hazards.
7. Different food adulteration practices.

Unit: 5. Air

[6]

Sub-unit 1: Introduction of air pollution.

1. Concept of air and its composition.
2. Concept of air pollution.
3. Effects of air pollution on health and society.
4. e sources air pollution.
5. Indicators of air pollution.

Sub-unit 2: Prevention and control of pollution.

1. Measures for the prevention and control of air pollution.
2. Methods for disinfection of air.

Sub-unit 3: Major issue in air pollution.

1. Theory of the green house effect, its causation and effects.
2. Current situation of ozone depletion, its causation and effects (impacts).
3. Concept of “acid rain.”
4. Causes and impact of acid rain.

Unit: 6. Entomology**[7]****Sub-unit 1: Introduction of Entomology.**

1. Concept of entomology and medical entomology
2. Medically important arthropods and insects.
3. Arthropod and insect borne diseases.
4. Transmission of each of the common arthropod/insect borne diseases.
5. major insect borne disease and identify its transmission
6. Different types of arthropod in a area and study diseases caused by them.
- 7.

Sub-unit 2: Arthropod borne diseases and its control

1. Principles of arthropod control.
2. Measures to control arthropod and insect diseases.
3. Diseases caused by: mosquito, housefly, bed bug; redevid bug, hard ticks, soft ticks, trombiculid mites, itch, mites, cycleps, cockroaches, louse, and fleas.
4. Actions of different types of insecticides and repellents.

Unit: 7. Occupational Health**[5]**

1. Concept of Occupational health and occupational disease
2. Common occupational diseases in Nepal.
3. Clinical features and causes of these occupational diseases.
4. Three forms of prevention of occupational diseases and give an example of each.

Practical:**[78]**

- Identify different method of waste management
- Identify and categorize different types of hospital waste
- Identify different types of arthropod in a area and study diseases caused by them.
- Identify different sources of water, determine its quality and methods to purify water in small scale
- Understand the process of water purification in large scale

References:

- Park's Textbook of Preventive and Social Medicine, by K. Park. Published by M/S Banarasidas Bhanot, Jabalpur, India. Current edition.
- State of Environment, Published by ICIMOD
- United Nations Environment Program (UNEP) Publications International Center for Integrated Mountain Development,(ICIMOD) Publications

Basic Medical Procedures/First Aid

Year: II

Theory: 3 hrs/week

Practical: 2 hrs/week

Full Marks: (Th. 75 + Pr. 50)

Pass Marks: (Th. 30 + Pr. 25)

Course Description:

This course provides the principles and techniques for performing the skills of medical care at the Health Assistant level, and includes a basic first aid course. The skills include basic history taking and physical examination, procedures for administering medications, wound care, performing invasive procedures, and simple suturing. The first aid course includes procedures for bandaging, cardiopulmonary resuscitation, and choking, in addition to basic first aid measures.

Objectives:

By completion of this course the learner will be able to:

- Respond appropriately to first aid situations at the health post or elsewhere in the community.
- Identify first aid situations which require referral to a higher level facility.
- Perform a basic history taking and physical examination of the patient efficiently and thoroughly.
- Perform selected basic invasive procedures and wound care according to guidelines.
- Administer medications by each route safely and efficiently.
- Maintain medical or surgical asepsis during procedures as needed.
- Maintain hygienic conditions within the health post.
- Identify topics for community education to promote safety and reduce preventable injuries.

Unit 1: Basic Medical Procedures

Sub-unit: 1 Professional Role

[5]

1. Qualities of: integrity, responsibility, commitment, respectfulness, healthful living, and desire for ongoing learning.
2. Consequences of unprofessional behavior.
3. Hierarchy of authority within the Nepalese health care system.
4. Role of the Nepal Professional Council.
5. Steps to follow when confronted with unethical or illegal behavior of another health care worker.
6. Responsibility to maintain current with continuing education.

Sub-unit: 2 Communicating Professionally

[6]

1. process of “sending-receiving” verbal, nonverbal, and written communication
2. Factors, which aid or interfere with clear communication.
3. Discuss how cultural values affect clear communication of ideas.
4. Importance/ application of establishing a trusting relationship between Dental Hygienist and patient.
5. ways to respectfully direct, inform, or make requests to others, in your role as Dental Hygienist

6. Demonstrate through role play:
 - a. Introducing self to co-workers, patients
 - b. Establishing trust with a patient
 - c. Requesting sensitive information from a patient
 - d. Giving bad news to a patient/family
 - e. Directing or correcting a subordinate
 - f. Making a request to your supervisor
7. Ways to collect subjective and objective data about the patient.

Sub-unit: 3 Assessment of vital signs

[5]

1. Definition, purpose, Indication, Types, sites, procedure of vital sign
2. Indications and purposes for V.S. measurement.
3. Factors which interfere with accurate measurements.
4. Tell implications of abnormal findings.
5. Significance of accuracy in V.S. measurement.
6. Demonstrate proper techniques according to guidelines:
 - Palpating pulses at six chief sites
 - Counting respirations
 - Taking temperature at 3 chief sites
 - Measuring blood pressure
 - Recording V.S.
 - Caring for V.S. equipment

Sub-unit: 4 History taking & Physical Examination (Head to Toe)

[6]

1. Objectives, process and equipments required for History taking & physical Examination
2. Purpose of the history & physical.
3. Strategies for organizing a history & physical.
4. Components of a complete history & physical.
5. Give examples when modifications must be made to the usual history and physical.
6. Ways to gain the trust of the patient and patient party.
7. Ways to provide privacy and promote comfort and cooperation of the patient.
8. History taking and physical exam in a simulated setting, according to guidelines.
9. Describe how symptom patterns and symptom correlations direct the process of differential diagnosis.
10. Diagnostic diagram for “abdominal pain” in the Manual for Primary Health.

Sub-unit: 5 Administration of oral and topical medicines

[5]

1. Definition of various routes of medication
2. Advantages & disadvantages of various routes of medication- oral, topical & injection
3. Things may interfere with the absorption of oral or topical medicines.
4. Ways to modify giving oral medicine when the patient is unable to cooperate with swallowing pills.
5. “5 rights” in the administration of all medicines.
6. Procedure for administering medicines into the eye, ear, nose, rectum, vagina or onto the skin.
7. Procedures for recording medication administration.
8. Administration of medicines by all of the above routes according to guidelines.

Sub-unit: 6 Administration of IM & IV medicines [8]

1. Advantages and disadvantages of medicine administration by the intramuscular (IM) and intravenous (IV) routes.
2. Types of medicine which are administered by subcutaneous (SC or SQ) or intradermal (ID) routes.
3. Appropriate sites for IM administration in adults, children and infants.
4. Risks when medicine is injected directly into the vein.
5. Precautions which must be followed to protect the patient from harmful IV medicine administration.
6. Procedures for administering IM and IV medicines, or beginning IV fluids, according to guidelines.
7. Risk of IV medication.
8. Technique and reason for using the “Z track” method of IM administration.
9. Principles and procedures for safe needle disposal.
10. Administration of medicines by the above routes according to guidelines.
11. Technique of one handed recapping, to use when a safe needle disposal, container is not readily available
12. Safe needle management.
13. Risks of administering drugs directly into the vein.
14. Guidelines for administration of medicine via parenteral routes.

Sub-unit: 7 Medical-surgical asepsis [5]

1. Difference between surgical asepsis (free from all organisms) and medical asepsis (free from pathogens)
2. Principles and rationale for medical asepsis and surgical asepsis.
3. Ways to maintain sanitation in the health post setting.
4. Proper hand-washing technique, according to guidelines.
5. Principles and rationale for using careful hand-washing.
6. Discuss when to use different kinds of hand-washing procedures.
7. Demonstrate aseptic technique when using instruments for an aseptic procedure.
8. Demonstrate handling sterile instruments during a sterile procedure.

Sub-unit: 8 Invasive Procedures [5]

1. Risks to a patient with each of these invasive procedures: urinary catheterization, Intravenous insertion, nasogastric insertion.
2. Meaning of implied consent.
3. Ways to make the invasive procedures less uncomfortable for the patient.
4. Signs of complications for each of these invasive procedures.
5. Demonstrate these procedures according to the guidelines.

Unit 2: First Aid

Sub-unit: 1 Principles of First Aid and Management [5]

1. Definition, objectives & principles
2. Aims of first aid and the responsibility of the first aider.
3. Initial actions of the first aider.
4. Essential principles of first aid.
5. Steps of assessment, management, referral and management of casualty case.

Sub-unit: 2 Dehydration, heat reaction, altitude sickness, hypothermia, frostbite [5]

1. Signs and symptoms of dehydration, heat reaction, altitude sickness, hypothermia, frostbite.

2. Correct use of rehydration therapy and other treatments for dehydration, heat reaction, altitude sickness, hypothermia, frostbite.
3. Indications that immediate referral to a higher level facility is necessary.
4. Prevention of dehydration, heat reaction, altitude sickness, hypothermia, frostbite

Sub-unit: 3 Animal bites, stings and poisoning [5]

1. Incidence of injury due to animal bites, stings and poisoning.
2. Importance/ application of capturing and/or identifying the snake, animal or poison which harmed the casualty.
3. Indications that a casualty is or may have a severe allergic reaction to an insect sting.
4. Appropriate management for cases of animal bites, stings or poisoning.
5. Use of emergency medications for bites, stings and poisons.
6. Indications that the casualty should be removed to a higher level medical facility immediately.

Sub-unit: 4 Fractures, splints, immobilization [5]

1. Definition
2. Types
3. Signs and Symptoms of fracture
4. Difference between the symptoms of a dislocation and a fracture.
5. Management of an open fracture.
6. Prevention measures

Sub-unit: 5 Wounds, burns and bandaging [6]

1. Definition of wound
2. Types: Closed and open wounds, lacerations, contusions, and abrasions.
3. Management of Wound according to its type
4. Definition and types Suturing
5. Types of bandage.
6. Procedures for controlling hemorrhage: pressure dressings, pressure point constriction.
7. Difference between different kinds of burns: chemical, friction, thermal, electrical.
8. Characteristics of 1st, 2nd and 3rd degree burns.
9. First Aid management of each degree burn.

Sub-unit: 6 Hemorrhage [5]

1. Concept of hemorrhage from: an extremity, abdominal wound, scalp wound, neck laceration.
2. Signs/symptoms of internal hemorrhage.
3. Interventions for stabilization of the person with severe blood loss.
4. Precautions to use when transporting a patient who has had severe blood loss.

Sub-unit: 7 Management of severe breathlessness [5]

1. Common causes for breathlessness (shortness of breath).
2. Cause, Sign and symptoms of breathlessness.
3. Management and referral to breathlessness.

Sub-unit: 8 Heart attack/Myocardial Infarction [6]

1. Definition
2. Signs and symptoms
3. Concept of patho-physiology of myocardial infarction (M.I.)
4. Difference between angina and M.I.
5. Common symptoms of M.I.
6. Management and referral to Heart attack/Myocardial Infarction

Sub-unit: 9 Epileptic seizure**[5]**

1. Causes and clinical features of epileptic seizure (fits).
2. Difference between epileptic seizure and conversion disorder
3. Management of a seizure (fit) for adults and children.
4. Management and referral of Epileptic seizure

Sub-unit: 10 Concussions and Stroke (CVA)**[5]**

1. Concept of concussion.
2. Signs and symptoms of mild, moderate and severe concussion and skull fracture.
3. Management of mild, moderate and severe concussion.
4. Concept of stroke, or cerebral vascular accident (CVA).
5. Signs and symptoms of mild, moderate or severe stroke.
6. Management of mild, moderate, or severe stroke.

Sub-unit: 11 Assessment of unconscious person**[5]**

1. Concept of ABC's of vital functions:
 - airway clear
 - breathing adequate
 - circulation and cardiac function good
2. Signs of common causes of unconsciousness.
3. Management of unconscious person

Sub-unit:12 Choking and obstructed breathing**[5]**

1. Concept of choking
2. Causes of airway obstruction
3. Clinical features of obstruction.
4. Management and referral.

Sub-unit: 13 Basic life support & CPR**[6]**

1. Concept and objectives
2. Assessment of ABC
3. Indication of CPR
4. Process of CPR
5. Complication of CPR
6. Difference between CPR procedure for adult, child, infant, pregnant woman.
7. Management and referral system

Sub-unit: 14 Multiple casualty/ multiple injury triage**[4]**

1. Concept of triage.
2. Purpose of triage
3. Management and referral system

Practical:**[78]**

- Perform Hand washing
- Take vital signs
 - Count Respiration
 - Take temperature at 3 chief sites
 - Take palpation pulse at 6 chief sites
 - Measure BP
- Perform history taking
- Administrate oral and topical medicine
- Administrate IV and IM medicine
- Demonstrate lifting and transporting a patient who must remain immobile.
- Demonstrate correct positioning to maintain the airway of an unconscious person.
- Demonstrate how to position an unconscious person to maintain an airway.
- Demonstrate how to assist the conscious and unconscious person with partial or complete airway obstruction by foreign body.
- Handle sterile instrument for aseptic measure
- Perform Invasive procedure for NG insertion, Foleys Catheterization, IV canula,
- Perform simple suturing
- Perform Bandaging and wound dressing
- Manage Airway obstruction
- Manage CPR

References:

- First Aid: the Authorized Manual of St. John's Ambulance Association (current edition)
- Manual for Primary Health Care, Health Learning Materials Center, 1999/2055
- Fundamentals of Nursing, Health Learning Materials Center

Third Year

BASIC PERIODONTOLOGY II

Year: III

Theory: 3 hrs/week

Practical: 5 hrs/week

Full Marks: (Th. 50 + Pr. 50)

Pass Marks: (Th. 20 + Pr. 25)

Course Description

The course introduces the students to basic knowledge and skill necessary to perform dental scaling using manual instruments as well as ultra-sonic instruments on patients for common gingival and periodontal problems and refer the patients who require further treatment

Course Objectives

After Completion of course the student will be able to:

1. Diagnose and classify common periodontal disease
2. Acquire knowledge and skill to perform dental scaling using manual instruments as well as ultra-sonic instruments on patients
3. Conserve the tooth to the maximum possible extent by maintaining periodontal health
4. Develop an attitude to perform the treatment with full aseptic precautions
5. Refer the patients to Dental Surgeon or Periodontist who require further treatment.

Unit 1: Periodontal Pathology

[20]

Sub unit 1: Gingival inflammation

1. Concept of gingival inflammation
2. Various stages of gingival inflammation
3. Definition of gingivitis
4. Course, duration and distribution of gingivitis
5. Clinical features of gingivitis

Sub unit 2: Gingival enlargement

1. Definition and classification of gingival enlargement
2. Location and distribution of gingival enlargement
3. Types of gingival enlargement
4. Gingival enlargements associated with systemic diseases
5. Neoplastic gingival enlargement
6. Discuss false enlargement

Sub unit 3: Gingival lesions

1. Describe acute necrotizing ulcerative gingivitis
2. Describe acute herpetic gingivostomatitis
3. Describe pericoronitis
4. Describe chronic desquamative gingivitis

Sub unit 4: Periodontitis

1. Definition and classification of periodontitis
2. Progression of periodontitis
3. Chronic periodontitis
4. Aggressive periodontitis

Sub unit 5: Periodontal pocket

1. Definition of and classification of periodontal pocket
2. Clinical features
3. Pathogenesis and histopathology
4. Microtopography of gingival wall of the pocket
5. Pocket contents
6. Periodontal disease activity
7. Loss of attachment and bone loss
8. Difference between infrabony and suprabony pockets
9. Sequelae of periodontal pocket

Sub unit 6: Periodontal abscess and cyst

1. Concept of periodontal abscess
2. Concept of periodontal cyst

Sub unit 7: Bone loss and pattern of bone destruction

1. Bone destruction caused by extension of gingival inflammation
2. Bone destruction caused by TFO
3. Bone destruction patterns in periodontal disease
4. Gingival recession
5. Furcation involvement
6. Describe tooth mobility

Sub unit 8: Halitosis

1. Definition of Halitosis
2. Causes/ Etiology of Halitosis
3. Management of Halitosis

Unit 2: Periodontal response to external forces**[8]**

1. Discuss physiologic adaptive capacity of the periodontium to occlusal forces
2. Definition of trauma from occlusion
3. Difference between primary and secondary trauma from occlusion
4. Influence of TFO on progression of marginal periodontitis
5. Pathogenesis of TFO
6. Fremitus test
7. Acute and chronic trauma
8. Pathological tooth migration

Unit 3: Systemic Effects of Periodontal Diseases**[5]**

1. Discuss cardiovascular disease/ SABC caused due to periodontal disease

Unit 4: Treatment of Periodontal Disease

[22]

Sub unit 1: Diagnosis

1. Definition of diagnosis and describe routine procedures of diagnosis
2. Case history taking
3. Clinical examination
4. Methods of probing
5. Types of probes
6. Routine investigative methods
7. Advanced diagnostic aids and their role in brief

Sub unit 2: Prognosis

1. Definition of prognosis in periodontics
2. Types of prognosis
3. Purpose and factors to be taken into consideration in individual and overall prognosis

Sub unit 3: Treatment

1. Rationale of various phases in treatment planning of periodontal disease
2. Definition of scaling and root planing
3. Aims and objective of scaling and root planing
4. Indications and contraindications of scaling and root planing
5. Complications of improper scaling
6. Tooth polishing
7. Topical fluoride application
8. Follow up
9. Referral

Sub unit 4: Hypersensitivity of teeth

1. Definition of hypersensitivity of teeth
2. Causes of hypersensitivity of teeth
3. Theories on hypersensitivity of teeth
4. Treatment and precautions for sensitive teeth
5. Post-scaling hypersensitivity and its remedy
6. Medicated dentifrices and their mechanisms of action

Sub unit 5: Pharmaco-therapy

1. Concept of Local drug delivery system in periodontal therapy
2. Various topical pharmacological agents used in periodontal therapy

Sub unit 6: Periodontal dressings

1. Types, uses
2. Advantages and Disadvantages
3. Manipulation

Sub unit 7: Patient management

1. Concept of education, motivation, and oral hygiene instruction to the patient
2. Pain and anxiety control
3. Post-operative instructions
4. Periodontal treatment of medically compromised patient
5. Dental hygiene care of denture patients
6. Dental hygiene care of orthodontic patients

Unit 5: Infection control

[5]

1. Concept of personal aseptic measures taken by the dental hygienist
2. Various sterilization and aseptic procedures in dental operatory
3. Possible cross infections during dental procedures

Practical Exercises:

[100]

Unit 1: Periodontal Pathology

Sub unit 1: Gingival inflammation

1. Demonstrate gingivitis and its clinical feature on patient

Sub unit 2: Gingival enlargement

1. Demonstrate gingival enlargement and its distribution on patient
2. Demonstrate gingival enlargements associated with systemic diseases
3. Demonstrate neoplastic gingival enlargement
4. Demonstrate false enlargement

Sub unit 3: Gingival lesions

1. Demonstrate acute necrotizing ulcerative gingivitis on patient
2. Demonstrate acute herpetic gingivostomatitis
3. Demonstrate pericoronitis
4. Demonstrate chronic desquamative gingivitis

Sub unit 4: Periodontitis

1. Demonstrate various types of periodontitis on patient
2. Demonstrate necrotizing ulcerative periodontitis

Sub unit 5: Periodontal pocket

1. Demonstrate periodontal pocket and its clinical features on patient
2. Demonstrate loss of attachment and bone loss due to periodontal pocket in radiograph
3. Differentiate between infrabony and suprabony pockets
4. Demonstrate sequelae of periodontal pocket

Sub unit 6: Periodontal abscess and cyst

1. Identify periodontal abscess
2. Identify periodontal cyst with the help of radiograph

Sub unit 7: Bone loss and pattern of bone destruction

1. Identify bone destruction caused by chronic and aggressive periodontitis with the help of radiograph
2. Identify bone destruction caused by TFO with the help of radiograph
3. Demonstrate gingival recession and identify its cause
4. Demonstrate furcation involvement and identify its grade
5. Demonstrate tooth mobility and identify its grade

Unit 2: Periodontal response to external forces

1. Identify trauma from occlusion
2. Differentiate primary and secondary trauma from occlusion
3. Identify influence of TFO on progression of marginal periodontitis
4. Identify pathological tooth migration

Unit 3: Treatment of Periodontal Disease

Sub unit 1: Diagnosis

1. Perform routine procedures of diagnosis
2. Perform case history taking
3. Perform clinical examination
4. Demonstrate methods of probing

Sub unit 2: Treatment

1. Perform scaling and
2. Perform tooth polishing
3. Perform topical fluoride application

Sub unit 3: Pharmaco-therapy

1. Prescribe various antiplaque agents used in periodontal therapy
2. Prescribe medicated dentifrices and their mechanisms of action

Sub unit 4: Patient management

1. Perform education, motivation, and oral hygiene instruction to the patient
2. Explain post-operative instructions to the patient
3. Perform dental hygiene care of denture patients
4. Perform dental hygiene care of orthodontic patients

Unit 4: Infection control

1. Demonstrate personal aseptic measures taken by the dental hygienist
2. Perform various sterilization and aseptic procedures in dental operator

References:

- Glickman's Clinical Periodontology-Carranza
- Clinical Periodontology Implant Dentistry Fifth edition 1997
- Text book of Clinical Periodontology Jan Lindhe
- Fundamentals of Periodontology Jill and Nield

FOOD AND NUTRITION

Year: III

Theory: 3 hrs/week

Practical: 2 hrs/week

Full Marks: (Th. 50 + Pr. 25)

Pass Marks: (Th. 20 + Pr. 12.5)

Course Description:

This course aims to orient the students about the basic knowledge on food and nutrition. It also provides knowledge about nutritional aspects of oral health with emphasis on oral manifestation of different nutritional deficiency and to prevent them and also be able to recommend proper dietary habits.

Objectives:

At the end of the course, the learner will be able to:

1. Acquainted with the basic concepts of food and nutrition
2. Describe protein, vitamins, minerals with emphasis on deficiency and adverse reactions in relation to oral manifestations
3. Perform prevention of nutritional deficiency.

Unit I: Orientation to Food and Basic Nutrition

[25]

Sub Unit 1: Basic Concepts about Food and Nutrition Carbohydrate

1. Source and function of carbohydrate.
2. Mention the recommended dietary allowance.
3. List different deficiency (emphasis on oral manifestation)
4. Mention adverse reaction (emphasis on oral manifestation)

Sub Unit 2: Proteins

1. List the source and function of proteins.
2. Mention the recommended dietary allowance.
3. List different deficiency (emphasis on oral manifestation)
4. Mention adverse reaction (emphasis on oral manifestation)

Sub Unit 3: Vitamins (Water Soluble & Fat Soluble)

1. List source & function of vitamins.
2. Mention the recommended dietary allowance
3. List different deficiency (emphasis on oral manifestation)
4. Mention adverse reaction (emphasis on oral manifestation)

Sub Unit 4: Minerals & Water (Iron, Zn, Ca, Phosphorus)

1. List source & function of minerals & water.
2. Mention the recommended dietary allowance

3. List different deficiency (emphasis on oral manifestation)
4. Mention adverse reaction (emphasis on oral manifestation)

Sub Unit 5: Vitamins /Minerals/ Water (requirement for calcified structure/oral soft tissues/ salivary glands)

Unit 2: Nutritional Aspects of Oral Health

[25]

Sub Unit 1: Nutritional Aspects of dental caries, Causes and prevention

1. Roles the tooth , saliva, food and plaque play as factors in the carries process
2. Identification of foods that stimulate salivary flow
3. Suggest anti-cariogenic foods choices to modify a cariogenic diet
4. Characteristics of some foods that are non cariogenic
5. Dietary counseling to a patient who is at risk of dental carries.

Sub Unit 2: Nutritional Aspects of gingivitis and periodontal diseases

1. **Role** nutrition plays in periodontal health and diseases
2. Effects of food consistency and composition in periodontal diseases
3. Etiologic factors associated with gingivitis and periodontitis
4. Major structure of periodontium
5. Components **of nutritional counseling for periodontal patient**

Sub Unit 3: Nutritional Aspects of alterations in the oral cavity

1. Common sign and symptoms of xerostomia and glossitis
2. Different factors contributing to xerostomia and glossitis
3. Determination of appropriate dietary recommendations for a patient with xerostomia and removable appliances
4. Dietary guidelines to be given to a new denture patient both pre and post insertion

Sub Unit 4: Nutritional Assessment counseling for dental Science patient

1. Importance/ application of thorough health social and dental History
2. Components needed to assess the nutritional status of a patient
3. Dietary treatment plan for a dental problem influence by nutrition
4. Steps in a nutritional counseling session
5. Several communication skills that are helpful for the dental hygienist to employ when counseling a patient

Unit 3: Considerations of clinical nutrition

[10]

Sub Unit 1: Nutritional requirement affecting oral health in females

1. Nutritional deficiencies and their impact of tooth and oral development
2. List various nutrients that are usually supplemented during pregnancy and lactation

Sub Unit 2: Effects of systemic diseases on nutritional status and oral health

1. Major oral problems (sign and Symptoms associated with systemic diseases of system basis
2. Recognize disease and conditions that are likely to affect nutritional intake
3. Appropriate dental Science instructions for patient with systemic disease or conditions having oral manifestation
4. Nutritional recommendation for patient with disease or conditions with oral manifestation

Practical

[40]

Unit 1: Diet counseling

1. Prepare diet chart for diet counseling classes
2. Prepare food pyramids for diet counseling classes
3. Conduct diet counseling classes

Unit 2: Diet methods and chart

1. Demonstrate diet methods
2. Prepare diet chart for patient

References:

- Adhikari, R.K & Krants ME. (1997) Child Nutrition & Health 2nd edition ,HLMC
- Adhikri RK.(2059).Nutrition and health, Educational Publishing House, (Nepali)
- Community Health nursing,HLMC,1995
- Park J.E and Park K. (1982).Textbook of Preventive and Social Medicine, 21 edition

Dental Pharmacology

Year: III

Theory: 3 hrs/week

Practical: 3 hrs/week

Full Marks: (Th. 50 + Pr. 50)

Pass Marks: (Th. 20 + Pr. 25)

Course Description:

This course aims to orient the students on the drugs used in the process of oral prophylaxis. The students will be taught about the pharmacology of the drugs used during oral prophylaxis and its administration, in order that they are able to prescribe it depending on its need. The course also includes brief concepts about few groups drugs commonly used in dentistry.

Course Objectives:

After Completion of course the student will be able to:

- Identify the various drugs used in oral prophylaxis
- Identify and advise drugs for dental preventive purposes
- Prescribe oral preventive drugs

Unit 1: Definition & Routes of Drug Administration

[18]

Sub Unit 1: Dental pharmacology & drugs administration

1. Definition of pharmacology & drugs
2. Different routes of administration with their advantage and disadvantages.
3. Pharmacodynamics and Pharmacokinetics of Drugs.

Sub Unit 2: Antiplaque and antimicrobial agents

1. Definition of plaque and antiplaque
2. List different antiplaque agent
3. Properties & uses of antiplaque agents.
4. Chlorhexidine gluconate as Antiplaque agent including Chemistry, Mode of Action, Uses & side effect & Drug dosage.
5. Different analgesic and antimicrobial that can be used locally

Unit 2: Dentrifrices, Mouth Wash, Obtundents, Anti Caries, Astringents & Topical Anesthetic Agents

[20]

Sub Unit 1: Dentrifrices

1. Definition of dentrifrices.
2. Properties and types of dentrifrices.
3. Functions of dentrifrices.

4. Composition/ ingredients with their function.

Sub Unit 2: Obtundents

1. Concept of obtundents.
2. Uses of obtundents.

Sub Unit 3: Anti Caries Agent

1. Definition of anti caries agent
2. Classification of anti caries agent
3. Mode of action on the prevention of caries.
4. Overview of fluoride as anticaries agent including source, fluoride vehicle, topical & systemic fluoridation & fluoride toxicity.

Sub Unit 4: Astringents & Topical Anesthetic Agents

1. List different astringents & topical anesthetic agents.

Unit 3: Drugs use in dentistry (Analgesics and Antimicrobials)

[22]

Sub Unit 1: Non opioid (non Narcotic)/ and Opioid analgesic

1. Introduction and classification of analgesic drugs
2. Difference between Non opioid (non Narcotic)/ and Opioid analgesic
3. Groups of drugs under Non opioid analgesic including mechanism of action, uses and adverse reaction.
4. Groups of drugs under opioid analgesic including mechanism of action, uses and adverse reaction.

Sub Unit 2: Antimicrobials / anti-infective agents

1. Introduction of antimicrobials
2. Classification of antimicrobials
3. Indication for antimicrobial agents
4. Therapeutics
5. Prophylactic
6. List general adverse reactions associated with antibiotic agents
 - a. super infection
 - b. allergic reaction
 - c. Drug interactions
 - d. Gastro intestinal complaints
 - e. Pregnancy
 - f. Dosage related toxicity
7. Identify Mechanism of action Uses and Adverse drug reactions

A. Penicillin group of antibiotic

- a. Mechanism of action
- b. Uses
- c. Adverse drug reactions

B. Macrolide group of antibiotic

- a. Mechanism of action
- b. Uses
- c. Adverse drug reactions

C. Tetracycline group of antibiotic

- a. Mechanism of action
- b. Uses
- c. Adverse drug reactions

D. Metronidazole group of antibiotic

- a. Mechanism of action
- b. Uses
- c. Adverse drug reactions

E. Cephalosporins group of antibiotic

- a. Mechanism of action
- b. Uses
- c. Adverse drug reactions

8. Antibiotic resistance

Sub Unit 3: Local Anesthesia

- 1. Definition of local Anesthesia
- 2. Ideal requirements of local Anesthesia
- 3. Composition of local Anesthesia
- 4. Uses of local Anesthesia
- 5. Classification of local Anesthesia
- 6. Instruments used to deliver local anesthesia
- 7. Adverse reaction (Toxicity)

Sub Unit 4: Prescription Writing

- 1. Introduction of Prescription Writing
- 2. Format

Sub Unit 3: Antibiotic prophylaxis used for systemically compromised patient before dental surgical procedure

Practical

[60]

Unit 1: Routes of administration & agents.

1. Demonstrate different routes of administration with example.
2. Recognize plaque disclosing agents.
3. Prescribe anti-plaque agents

Unit 2: Tooth paste

- 1 Prepare tooth paste

References:

- Katzung Basic and Clinical Pharmacology, Published by McGraw- Hill Medical; India, Current Edition
- Kafle, K.K. & Pinniger, R.G., Diagnostic and Treatment Manual for Primary Health Care in the District. Health Learning Materials Center, Tribhuvan University, Nepal.
- Tripathi, K.D., Essentials of Medical Pharmacology. Published by Jaypee Br. , New Delhi. current edition.
- Satoskar, R.S. et al. Pharmacology and Pharmacotherapeutics. Published by Popular Prakashan, Mumbai.or current edition.
- Laurence, D.R., et al., Clinical Pharmacology 8th ed.Published by Churchill Livingstone, London.current edition.
- Handbook for Drug Retailers and Wholesalers. Produced by Government of Nepal, Department of Drug Administration. current edition.
- Dr. Satish Kumar Deo, Deo's Basics of Clinical Pharmacology, First Edition, Published by: .Ultimate Hi-Tech Press (P.) Ltd., Lazimpat, Kathmandu
- Current Index of Medical Specialties. Bio-Gard Private Limited, Bangalore, India. Current edition.
- Joshi, M.P. and Adhikari, R.K., Manual of Drugs and Therapeutics. Distributed by Health Learning Materials Center, Kathmandu, Nepal. 1996.

Health Management

Year: III

Theory: 3 hrs/week

Practical: 2 hrs/week

Full Marks: (Th. 50 + Pr. 25)

Pass Marks: (Th. 20 + Pr. 12.5)

Course Description:

This course introduces the student to concepts about management of dental health care services, as it applies to the operations of a dental health care center. This course teaches about the dental health care system in Nepal, fundamental principles of management, national dental health policy and dental health programmes, dental health manpower in Nepal, dental health related organizations and agencies, logistics management, leadership and personnel management, dental health issues and professional practice. The student will acquire the necessary knowledge and skill to deal effectively with the diverse challenges of dental health service management.

Objectives:

On completion of the course the student will be able to:

1. Identify dental health care systems in Nepal.
2. Explain the theories, principles and components of dental health management.
3. Describe the national dental health policy, tell its philosophy, and identify its strengths and weaknesses.
4. Apply the principles of logistics management and quality assurance to dental health unit management.
5. Manage a dental health office/unit in the real setting.
6. Identify the different levels of dental health manpower in Nepal and describe the functions of the dental health manpower development institute.
7. Explain the goals and functions of the dental health related governmental organizations, non-governmental organizations (NGO's), international non-governmental organizations (INGO's) and international agencies that serve in Nepal.
8. Identify current national and international dental health issues.
9. Explain the code of ethics of the Dental Hygienist.

Unit 1: Health care system in Nepal

[7]

Sub-unit 1: Health Care System

1. Introduction, purpose and characteristics of dental health care system.
2. History of the development of dental health services in Nepal.
3. Ayurvedic, homeopathic and allopathic approaches to dental health care.
4. Situations when the most appropriate type of dental treatment might be ayurvedic care, homeopathic care, allopathic care, or a combination of these.

Unit: 2 Fundamentals of Health Management

[15]

Sub-unit 1: Introduction to Health Management

1. Definition of management, health management and dental health management
2. Difference between “setn” management & administration.
3. Function of management.

Sub-unit 2: Planning of Health Service

1. Process and purpose of planning.
2. Different types of planning.

3. Planning cycle.
4. Steps of planning.
5. Health planning system in Nepal.

Sub-unit 3: Organizing of Health Service

1. Process and purpose of organization.
2. Different types of health service organizations.
3. Different types dental health service in Nepal.

Sub-unit 4: Principles of Leadership

1. Characteristics and advantages/disadvantages of each of the leadership styles:
 - a. Autocratic
 - b. Democratic
 - c. Laissez faire

Sub-unit 5: Staffing

1. Purpose of using a job description.
2. Elements of a job description.
3. Tell why you support or disagree with the statement, “experienced staffs are experts in their role.”

Sub-unit 6: Directing

1. Meaning and purpose of delegation of authority.
2. Relationship between delegation and authority.
3. Process and limits of delegation.

Sub-unit 7: Supervision

1. Objectives and methods of supervision.
2. Different types of tools use in supervision.
3. Process of supervision.
4. Methods of monitoring.
5. Steps of a monitoring program.

Sub-unit 8: Coordination

1. Definition of coordination in terms of dental health management.
2. Different types of coordination.
3. Techniques and processes of coordination.

Sub-unit 9: Disaster Coordination

1. Historical events and potential for future disasters from these causes: earthquake, flooding, nuclear explosion.
2. Health risks created by each of these disasters.
3. Policies and procedures developed by the earthquake preparedness committee in Kathmandu.
4. Major points of the national guidelines for disaster management.

Sub-unit 10: Reporting

1. Purpose of dental health office/unit reporting.
2. Qualities of an effective dental health office report.
3. Prepare a simulated dental health office/unit report from a case example.
4. Process of dental health reporting in Nepal.

Sub-unit 11: Budgeting

1. Purpose for using a budget in dental health management.

2. Different types of budgets.

Unit: 3 Dental offices Management

[16]

Sub-unit 1: Training

1. Definition and purpose of training.
2. Different types of training and tell the advantages and disadvantages of each.
3. Process for assessing the need for training.
4. Process of planning, conducting & evaluation of training program

Sub-unit 2: Conduct Staff Meeting

1. Need for a meeting.
2. Tell how to decide what to include on a meeting agenda.
3. Describe how to plan for an effective meeting.
4. Strategies for conducting and effective meeting.

Sub-unit 3: Financial Management

1. Purpose and procedures for financial management.
2. Prepare an annual budget from a simulated example.
3. Maintain records of income and expenditure.
4. Prepare monthly / quarterly and annual financial statements.

Sub-unit 4: Leave Management

1. Different types of employee leaves.
2. Procedure for making a request for leave.
3. Maintain records of staff leave.
4. Reasoning used before giving approval of staff leave.

Sub-unit 5: Logistic Management

1. Purpose of logistics management.
2. Logistic Management Information System (LMIS) practiced in Nepal.
3. “Six rights” of logistic management.
4. Concept of logistic cycle.

Sub-unit 6: Inventory Management

1. Purpose and process of physical inventory.
2. Difference between expendable and non-expendable goods.
3. Definition of storage and store standard.
4. Procedure for Cold Chain storage of medical / dental supplies.
5. Essential data of logistics information.
6. Process of calculating and demanding items, for both regular and emergency needs.
7. Process of distributing commodities.

Sub-unit 7: Quality Assurance

1. Compare different definitions of quality health care.
2. Reasons for using the quality assurance (QA) program.
3. Characteristics of a quality assurance program.
4. Definition of the term “standards” and give examples of health care standards.
5. List the ways that standards help to close the gap between actual performance and desired outcomes.
6. Give examples of ways to reduce the costs caused by poor quality health care.
7. Give examples of ways to improve patient satisfaction with services.
8. List the 4 “focus areas” of quality assurance principles.
9. Explain why the process of quality assurance is viewed as a cycle.
10. Use the methods and principles of QA to identify and plan a solution to a real health care problem.

Sub-unit 8: Performance Evaluation of Staff

1. Purposes and benefits of regular staff performance evaluations.
2. Importance of writing a clear and complete staff job description.
3. Develop staff job descriptions for a simulated example.
4. Develop a staff performance evaluation checklist based on the job description.
5. Describe how to effectively give a job assignment.
6. Identify indicators of a good job performance.
7. Role-play ways to counsel the staff, who has poor job performance.

Sub-unit 9: Space Management

1. Discuss how to assess workspace required for various Dental office activities.
2. Demonstrate how to arrange a flow chart of each activity.
3. Describe ways to arranging space as per activities.
4. Demonstrate how to make a map of a catchment area.

Sub-unit 10: Time Management

1. Describe how to compute staff workload.
2. Demonstrate how to prepare a timetable of Dental unit activities.
 - a. Weekly
 - b. Monthly
 - c. Quarterly
 - d. Yearly

Sub-unit 11: Letter Writing

1. Different types of letters and discuss the purposes of each.
2. Identify the good and poor attributes of a letter.
3. Write selected official letters based on a simulated example.

Sub-unit 12: Problem Solving

1. Define problem and problem solving.
2. Identify steps of problem solving.
3. Apply the steps of problem solving to a real or simulated case.
4. Describe common mistakes of using the problem solving method.

Sub-unit 13: Health Management Information System (HMIS)

1. Purpose of the HMIS.
2. Important benefits of this system.
3. Process of HMIS

4. Use of the different types of HMIS forms.
5. Use of the HMIS records and reports.

Sub-unit 14: Human Resource Management (HRM)

1. Purpose of the HRM.
2. Important benefits of this system.
3. Process of HRM
4. Use of the different types of HRM forms.

Unit 4: Health related organization

[6]

Sub-unit 1: International Non-Governmental Organizations (INGO's)

1. Identify the activities and goals of INGO are working in health sectors.
2. Role in promoting the health care system.

Sub-unit 2: National Non-Governmental Organizations (NGO's)

1. Identify the activities and goals of NGOS working in health & health related sector.
2. Roles in promotion of the health care system.

Sub-unit 3: International Agencies

1. Identify international bilateral & multilateral agencies.
2. Roles and activities in health sectors.

Unit 5: National Health Policy and Health Programs

[5]

Sub-unit 1: Various Health Programmes

1. Objectives and activities of national health programmes.

Unit 6: National Health Policies in Nepal

[5]

Sub-unit 1: National Health Policy

1. Components of the National Health Policy 1991.
2. Introduction of current five-year plan.
3. Concept of Nepal's long term health plan.

Unit 7: Health Issues & Professional Practice

[6]

Sub-unit 1: Professional Practice

1. Overview of code of conduct for Dental Hygienist.
2. Purpose of a code of conduct.
3. Describe the formation, activities and functioning of the Nepal Health Professional Council (NHPC).

Sub-unit 2: Entrepreneurship

1. Concept of entrepreneurship.
2. Discuss how the community and dental office might benefit if the Dental Hygienist began a private profit making business in addition to his role as Dental health unit chief.
3. Types of businesses a Dental health unit chief might operate.
4. Potential opportunities for unethical action to occur when the Dental Hygienist works simultaneously at two jobs.
5. Ways to prevent unethical occurrences by the Dental Hygienist/ entrepreneur.

Practical Exercises:

[40]

1. Conduct meeting and write a minute in simulative situation
2. Write an official letter (invitation, demand for commodity, leave and submission letter).
3. Prepare a duty roster
4. Prepare a weekly/monthly report
5. Prepare the tools for supervision
6. Prepare a monitoring tool
7. Prepare a evaluation tool
8. Prepare simple budget sheet
9. Prepare a sample job description
10. Make a goods register (JinsiKhata)
11. Formation of Health Facility Operation and Management Committee.
12. Leave and process of having leave

References:

- Dixit, H. The Quest for Health, Educational Enterprise, (P) Ltd., Kathmandu. 1999.
- Essential preventive Medicine by OP Gahyui Piyush Gupta Published by Vikas Publishing house India Current edition
- Health Logistics Procedure Manual. NHTC/LMD/USAID JSI, Nepal 2057.
- Health Statistics and EPI Cold Chain Management Procedure Manual. NHTC/LMD/USAID JSI, Nepal 2057.
- Inventory Control and Basic Logistics Procedure Manual on Store Management for PHC/HP and SHP Personnel. HMG/JSI. 2054B.S.
- Kamala, T. & Bishnu, R. Leadership and Management for Nurses. Health Learning Materials Centre, Tribuvan University, Kathmandu. 1990.
- Macmohan, R. et al. On Being In Charge, A guide to Management in Primary Health Care. WHO. Current edition.
- Manual for Primary Health Care, Health Learning Materials Center, 1999/2055
- Modern Management Methods and the Organization of Health Services, Public Health Papers #55. WHO. 1974.
- Park's textbooks of Preventive and Social Medicine by K park published by M/S Banarasidas Bhonot, Tabalpur India current edition
- Pradhananga, Y. Health Management. Council for Technical Education and Vocational Training, Bhaktapur, Nepal. 2055B.S.
- Shrestha, B.M. Basic Principles of Management. Akshyulak Publication, Nepal.

Dental Radiography & Dental Photography

Year: III

Theory: 2 hrs/week

Practical: 4 hrs/week

Full Marks: (Th. 25 + Pr. 50)

Pass Marks: (Th. 10 + Pr. 25)

Course Description:

This course aims to orient the students in dental radiography and photography as these are essential components to a dental auxiliary. S/he will be taught in detail in these topics enabling them to be competent in taking dental radiographs and photographs.

Objectives:

After Completion of course the student will be able to:

1. Define, identify and describe about dental radiography and photography
2. Competent in taking various dental radiographs
3. Competent in taking various dental photographs

Unit 1: Dental Radiography

[26]

Sub Unit 1: History & Principle of X-ray

1. Concept of X-ray
2. Properties of X-ray
3. Invention & development of X-ray
4. Principle of X-Ray Production
5. Various use of X-ray
6. Use of x-ray in Medical Science
7. Use and importance/ application of X-Ray in Dentistry
8. Types of radiograph in dentistry along with its uses

Sub Unit 2: Dental X-ray Machine & Its Major Parts with Function

1. Major parts of Dental X-ray Machine and draw its diagram
2. Role and function of X-ray Tube
3. Function of Timer in X-ray machine

Sub Unit 3: Dental X-ray Accessories

1. Function of X-ray Film & Developer Solution
2. Various film Positioning devices
3. Various types of X-ray Developing machine
4. Importance/ application of Voltage Stabilizer in X-ray Machine
5. List down dental X-ray accessories e.g. Collimation, grid, intensifying screen

Sub Unit 4: IOPA X-ray taking Procedure

1. Various Position of X-ray Tube (Cone) during IOPA x-ray taking
2. Relation between X-Ray Cone and Film distance and film holding methods
3. X-ray taking methods of upper Centrals & Laterals incisors
4. X-ray taking methods of upper canines
5. X-ray taking methods of upper Premolars
6. X-ray taking methods of upper Molars

7. X-ray taking methods of upper III Molars
8. X-ray taking methods of lower Centrals & Laterals
9. X-ray taking methods of lowers canines
10. X-ray taking methods of lowers premolars
11. X-ray taking methods of lowers Molars
12. X-ray taking methods of Lower III molars

Sub Unit 5: Bite wing X-ray taking Procedure

1. Advantage and Disadvantages of Bite Wing X-Ray
2. principle of Bite Wing Technique
3. X-ray film and X-ray cone position required in Bite wing technique

Sub Unit 6: Occlusal X-ray taking Procedure

1. Advantages and Disadvantages of Occlusal X-Ray
2. Occlusal X-ray Film
3. X-ray film and X-ray cone position required in Occlusal X-ray.

Sub Unit 7: Panoramic (OPG) X-ray taking Procedure

1. Advantages and Disadvantages of Panoramic X-Ray
2. Panoramic X-ray Film
3. Procedure of Panoramic X-Ray taking

Sub Unit 8: Cephalogram X-ray taking Procedure

1. Advantages and Disadvantages of Cephalogram X-Ray
2. Types of cephalometric view including frontal and lateral
3. Cephalogram X-ray Film
4. Procedure of cephalogram X-Ray taking

Sub Unit 9: Other X-ray taking Procedures

1. Procedure of Lateral oblique view x-ray taking
2. Procedure of TMJ view x-ray taking
3. Procedure of PNS viewx-ray taking

Sub Unit 10: Radiographic Errors & Solution

1. Concept of Cone Cut error and describe the technique to avoid it.
2. Define Under Exposure. Discuss the reason and management of Under exposure
3. Define Over Exposure. List the management of over exposure of X-ray
4. Reasons of Elongation of the object in the X-ray
5. Reasons of shorting of the object in the X-ray
6. Various Artifacts and its management in dental radiography

Sub Unit 11: X-ray Radiation Hazards & Safety

1. Various X-ray Radiation Hazards
2. Basic safety to be taken in Dental radiography

Sub Unit 12: X-ray film processing & mounting and Record keeping

1. Composition and function of Developer Solution.
2. Composition of function of Fixtute Solution
3. Methods of preparing Developing Solution
4. Methods of preparing Fixtute Solution
5. Requirement of X-ray Developing Room or Box
6. Steps of X-ray processing.
7. Methods of x-ray mounting and storing

Unit 2: Dental Photography

[14]

Sub Unit 1: Importance/ application of Clinical Photography

1. Importance/ application of clinical photographs in Dentistry

Sub Unit 2: Cameras and its Parts

1. SLR Camera and its advantages
2. Digital Camera and its advantages
3. Camera's basic parts like Body, Lenses, and Flash.

Sub Unit 3: Principles of Photography

1. Definition, importance and application of Shutter in photography
2. Define Aperture and explain its importance/ application in photography
3. Define Exposure and explain its importance/ application in photography
4. Light Source in dental photography
5. Define Depth of Field and explain its importance/ application in photography
6. Magnification, Focus and various methods
7. Composition in photography
8. Basic Armamentarium in photography and its uses

Sub Unit 4: Photographic Technique in Dentistry

1. Difference between Intra Oral and Extra Oral Technique
2. Basic Steps of Intra oral photographic technique of
 - a. Frontal View
 - b. Right Buccal View
 - c. Left Buccal View
 - d. Maxillary Occlusal
 - e. Mandibular Occlusal
3. Basic Steps of Extra oral photographic technique of
 - a. Full Face View
 - b. Profile View
4. Care and maintenance technique of dental photographic equipment

Practical Exercises:

[80]

Unit I: Dental Radiography

1. Identify various major parts of Dental X-ray Machine and draw its diagram
2. Prepare X-ray machine to take IOPA x-ray
3. Demonstrate various X-ray cone & X-ray film positing procedures used in IOPA X-ray
4. Take IOPA x-ray of Upper Anterior teeth
5. Take IOPA x-ray of Upper Premolar teeth
6. Take IOPA x-ray of Upper Molar teeth
7. Take IOPA x-ray of Lower Anterior teeth
8. Take IOPA x-ray of Upper premolar teeth
9. Take IOPA x-ray of Upper molar teeth
10. Take Bite wing x-ray of Molars teeth
11. Take Bite wing x-ray of Pre molar teeth

12. Take Occlusal X-ray
13. Take Panoramic X-ray
14. Take Frontal cephalogram X-ray
15. Take Lateral Cephalogram x-ray
16. Prepare X-ray processing materials
17. Process exposed IOPA X-ray
18. Demonstrate the mounting technique
19. Demonstrate the disinfecting & cleaning process of X-ray machine and materials

Practical site - Dental Clinic - X-ray Department

Unit 2: Dental Photography

1. Demonstration of various types of camera -
2. Identify and list major functions of Photographic Materials used in dentistry
3. Demonstrate SLR camera and its various parts
4. Demonstrate Digital Camera and its major parts
5. Prepare SLR camera for photography
6. Prepare patient for photography
7. Demonstrate the Steps of Intra oral photographic technique of
 - Frontal View
 - Right Buccal View
 - Left Buccal View
 - Maxillary Occlusal
 - Mandibular Occlusal
8. Demonstrate the Steps of Extra oral photographic technique of
 - Full Face View
 - Profile View
9. Take various Intra Oral photographs
10. Take Various Extra Oral photographs

Practical site - Dental Clinic / Department

References:

- **White and pharoach oral**
- **Dental radiology Dentisty Barnes and Noble**
- **Dentistry / Dental Radiology Thime Medical Publisiors**
- **Essential of Dental Radiography Erc Whaites**
- **Oral Radiology Principles Stuart C White**

DENTAL PUBLIC HEALTH & JURISPRUDENCE

Year: II

Theory: 5 hrs/week

Practical: 2 hrs/week

Full Marks: (Th. 75 + Pr. 25)

Pass Marks: (Th. 30 + Pr. 12.5)

Course Description:

This course is aimed at focusing the student's concentration on preventive oral health and the ethical issues connected with dental practice. The importance of preventive care and the means of achieving it emphasized in detail.

Objectives:

After Completion of course the student will be able to:

1. Acquire knowledge on preventive oral health and advocating it
2. Understand the ethical considerations surrounding the dental profession

Unit 1: Dental Public Health

[40]

Sub-Unit 1: Introduction

1. Concept of Public health
2. Principles followed in Dental Public Health Practice
3. Forms of Dental Health Services
4. Characteristic Public Health Techniques
5. Tools of Dental Public Health
6. Difference between Community Health Work and Private Practice

Sub-Unit 2: Dental Epidemiology

1. Definition of epidemiology and describe dental epidemiology
2. List and discuss the scientific methods and tools in dental epidemiology

Sub-Unit 3: Etiology & prevention of dental caries

1. Define prevention of dental caries
2. Enlist and discuss the etiologic factors of Dental Caries
3. Role of Diet in Dental Caries
4. Caries Process
5. List and briefly discuss Mechanical measures of Caries Control
6. List and briefly discuss Levels of Prevention of Dental Caries

Sub-Unit 4: Fluorides in Preventive Dentistry

1. Introduction of Fluoride
2. Sources of Fluoride for adults and children
3. Metabolism of Fluoride
4. Mechanism of Action of Fluorides in Caries Reduction
5. List the Fluoride delivery methods
6. List the Topical fluorides used in Preventive Dentistry
7. List the Fluoride vehicles
8. Modes of Action of Fluoride
9. Briefly discuss Toxicity of fluoride
10. Briefly discuss Community water fluoridation and school water fluoridation

Sub-Unit 5: Epidemiology, Etiology & Prevention of Periodontal Diseases

1. List and briefly discuss the Etiology of Periodontal Diseases
2. List and briefly discuss the Risk factors in Periodontal Disease
3. Prevention of Periodontal Diseases

Sub-Unit 6: Epidemiology, Etiology & Prevention of Oral Cancer

1. Introduction to Oral Cancer
2. Prevalence and Incidence of Oral Cancer
3. List and briefly discuss the Etiology of Oral Cancers
4. Prevention and Control of Oral Cancer
5. Effect of tobacco, smoking, and betel nut on oral health and in oral cancer

Sub-Unit 7: Indices used in Dental Epidemiology

1. Define Indices
2. List and discuss the indices used in Oral Hygiene Assessment, Gingival Diseases, Periodontal Disease, Dental Caries and Treatment Needs, DMFT

Sub-Unit 9: Behavior and its management in Public Health Dentistry

1. Introduction to behavior management
2. List and discuss the factors influencing preventive behavior
3. List the Behavioral characteristics of a normal child
4. List the categorical rating of behavioral patterns
5. Discuss how Behavior management can be achieved in public health dentistry

Sub-Unit 10: School Dental Health Programs

1. Introduction to school dental health program
2. List and briefly discuss the aspects of School Health Services
3. List and discuss the important elements of school dental health program
4. Plan a school dental health program
5. Define Incremental and Comprehensive dental care

Sub-Unit: 11 Survey Procedures

1. Define Survey and list its types
2. Define Basic oral health survey and Pathfinder Survey

Sub-Unit: 12 Dental workforces

1. Define dental surgeon, dentist, dental specialist
2. Define dental auxiliary and briefly discuss its classification, role and duties
3. List the degrees of Supervision of Auxiliaries
4. Certification, Registration & Limitation of the Dental Health Auxiliaries

Sub-Unit: 13 Occupational Hazards and Infection Control in Dentistry

1. Overview of infection control
2. Definition of Immunity
3. List the factors affecting disease
4. Enumerate the Transmissible Infections in Dentistry
5. List the categories of Task in relation to risk
6. Personal barrier technique for infection control
7. Disposal of clinical waste

Unit 2 Community based Services

[25]

Sub-Unit: 1 Atraumatic Restorative Treatment (ART).

1. Introduction to Atraumatic Restorative Treatment (ART)
2. Definition of Atraumatic Restorative Treatment (ART)
3. List instrument & material used in ART
4. ART technique
5. Advantages and limitations of ART
6. Carry out referral services.

Unit: 3 Extraction of teeth

1. Define exodontias. Explain indications, contraindications of extraction procedure
2. Take brief history of patient
3. Armamentarium used in Exodontia
4. Preparation for carrying out extraction
5. Complications of tooth extraction & its management
6. Post extraction care
7. Referral procedure of extraction
8. Define local anesthesia, classify, study composition, uses & complications in detail
9. Explain the debridement or irrigation of socket.

Unit 4 Dental Emergency

1. Anaphylactic Shock
2. Syncope
3. Seizures
4. Bleeding

Unit 5 Dental Jurisprudence

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Sub-Unit: 1 Law, Rights, Jurisprudence

1. Law
2. Classification of Laws
3. Rights
4. Legal Rights
5. Human Rights
6. Patient Rights
7. Jurisprudence

Sub-Unit: 2 Health

1. Definition of Health
2. Health Service in Nepal

Sub-Unit: 3 Health related Acts and Regulations of Nepal Government

1. Nepal Health Service Act, 2053
2. Nepal Medical Council Act, 2020
3. Nepal Health Professional Council Act, 2053
4. Drug Act & Regulation , 2035
5. Consumer Protection Act, 2053
6. Health Professional Protection Act, 2066

Sub-Unit: 4 Ethics

1. Code of Ethics of Nepal Medical Council
2. Code of Ethics of Nepal Health Professional Council

Sub-Unit: 5 Dental Healths

1. Dental Practice & Profession
2. Branches of Dentistry
3. Dental health service in Nepal
4. Dental health awareness
5. Professional conduct of the Dental Health Auxiliaries

Sub-Unit:6 Dental Jurisprudence

1. Iatrogenic problems
2. Medication errors
3. Accidents caused in dental office

Sub-Unit: 7 Dental Fraud & Crimes

1. Malpractice & quackery
2. Compensation cases
3. Sexual crimes & harassments caused by dental professionals

Sub-Unit: 8 Forensic Dentistry

1. Definition & Scope
2. Criminal cases
3. Accident cases
4. Mass disaster / Teeth identification
5. Natural death identification

Sub-Unit: 9 National/International Dental Health Authorities

1. Nepal Medical Council
2. Nepal Health Professional Council
3. Nepal Dental Association
4. World Health Organization

5. FDI International Dental Federation
6. International Federation of Dental Hygienists (IFDH)
7. Nepal Dental Science Hygienist Association

Practical

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Unit 1 Perform Automatic Restorative Treatment (ART)

1. Identify ART cases
2. List the instruments and materials.
3. Perform proper use of instruments used in ART.
4. Carry out mixing of materials used in ART.
5. Perform the techniques of ART Restorative procedure on Phantom head.
6. Observe the techniques of ART procedure by dentist on patient.
7. Perform the techniques of ART procedure.
8. Carry out referral procedure of ART.

Unit 2 Perform grade III mobile tooth and deciduous tooth extraction

[Extraction of grade III mobile tooth or deciduous tooth of which all possible ways of retaining/treating/correcting (saving) has been ruled out by a qualified dentist & is only been left with an option but to extract it is being given in a written order after the patient has been delivered a test dose of LA & is also been clinically proved of safe with LA administration by him also been proved safe of all clinical condition & under his supervision. (Extraction with local infiltration only)]

1. Identify grade III mobile permanent & deciduous cases
2. Take brief history of patient
3. Identify chair position
4. Perform sterilization of surgical area
5. Perform counseling procedure
6. Identify instruments used in grade III mobile permanent and deciduous teeth
7. Perform proper use of instruments used in grade III mobile permanent and deciduous teeth.
8. Identify post surgical materials.
9. Carry out proper use of instrument
10. Perform scientific & systematic technique of grade III mobile permanent and deciduous tooth removal.
11. Perform post extraction procedure
12. Perform post extraction instructions
13. Carry out referral procedure of extraction.

Unit 3 Assist to perform tooth extraction

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- Essential Preventive Medicine, by O.P. Ghai, Piyush Gupta. Vikas Publishing House, India. Current edition.
- Park, J.E. and Park, K., Textbook of Social and Preventive Medicine (15th ed.) 1997.
- Park, K. Park's Textbook of Preventive and Social Medicine. M/S Banarasidas Bhanot, Jabalpur, India. Current edition.
- Park, K. Textbook of Preventive and Social Medicine. Bhandrasidas Bhanot, Jabalpur, India. 2000.
- Peter, Soben Dr., Essentials of Preventive and Community Dentistry First Edition

Comprehensive Professional Field Practice

Third Year – A Comprehensive Clinical Practice

(In hospital setting)

Year: III

Practical Total: 480 hrs (40 hrs/week)

Full Marks: (Pr. 250)

Pass Marks: (Pr. 125)

Course description

This course is designed to help students to apply the knowledge and skills in the actual professional field practice in the hospital setting.

Course objective

After completion of this course the students will be able to:

1. Give education and advice on preventive dental health to the patients/people.
2. Perform manual scaling
3. Perform ultrasonic scaling
4. Perform tooth polishing
5. Give fluoride application
6. Prescribe oral medicaments and give oral Science instructions.
7. Give dietary advice
8. Perform sterilization and maintenance of dental instruments and materials respectively
9. Assist the dental surgeon in various dental procedures
10. Take IOPA radiographs, Bite wing X-ray radiographs, Occlusal X-ray radiographs Panoramic (OPG) X-ray radiographs Cephalogram X-ray radiographs
11. Take photographs dental photographs
12. Perform basic first aid procedures in the hospital setting.
13. Overlook and manage the dental office
14. Perform Automatic Restorative Treatment (ART)
15. Perform grade III mobile teeth and deciduous teeth extraction

Placement schedule

Students will be deputed to hospital and community for the period of **12 weeks** in the following subject area

S. No.	Subjects/Area
1.	Basic Periodontology
2.	Food and Nutrition
3.	Dental Pharmacology
4.	Dental Radiography and Photography
5	Dental Public Health and Jurisprudence
6	Dental Materials, Instruments and Assisting
7	Basic Medical Procedures / First Aid

Skills to be performed

1 For the completion of the training of Paper –I the students have to:

- 1.1. Give education and advice on preventive dental health to the patients/people.
- 1.2. Perform manual scaling at least 10 patients
- 1.3. Perform ultrasonic scaling of at least 10 patients
- 1.4. Perform tooth polishing of 5 patients
- 1.5. Give fluoride application on 2 patients.
- 1.6. Prescribe oral medicaments and give oral Science instructions 10 patients.
- 1.7. Give dietary advice to at least 5 patients.
- 1.8. Perform sterilization and maintenance of dental instruments and materials respectively
- 1.9. Assist the dental surgeon in various dental procedures in at least 10 cases
- 1.10. Take IOPA radiographs in 10 patients, Bite wing X-ray radiographs in 2 patients Occlusal X-ray radiographs Panoramic (OPG) X-ray radiographs Cephalogram X-ray radiographs in 1 patient each
- 1.11. Take photographs dental photographs of at least 2 patients
- 1.12. Perform basic first aid procedures in the clinical/hospital setting.
- 1.13. Overlook and manage the dental office
- 1.14. Perform Automatic Restorative Treatment (ART) at least 10 patients
- 1.15. Perform grade III mobile teeth and deciduous teeth extraction at least 10 patients

Evaluation scheme:

Evaluation and mark distribution is as follows:

S.N	Who does evaluate?	Marks
1	Supervisor of the organization in which the student is placed for comprehensive clinical practice (at hospital)	150
2	The Training Institute	50
3	CTEVT or its nominee (external)*	50
	Total	250

* Students are required to secure 50 percent marks in the all evaluation separately to pass the course.

Third Year –B Comprehensive Clinical Practice

(In Community)

Year: III

Practical Total: 480 hrs (40 hrs/week)

Full Marks: (Pr. 250)

Pass Marks: (Pr. 125)

Course description

This course is designed to help students to apply the knowledge and skills in the actual professional field practice in community.

Course objective

After completion of this course the students will be able to:

1. Perform manual scaling and give oral health education
2. Give oral health education
3. Give education and advice on preventive dental health to the patients/people.
4. Perform manual scaling
5. Prescribe oral medicaments and give oral Science instructions
6. Give fluoride application.
7. Perform sterilization and maintenance of dental instruments and materials respectively
8. Give dietary advice
9. Record OHI and CPITN
10. Record DMFT
11. Perform basic first aid procedures in the community.
12. Perform Automatic Restorative Treatment (ART) in community
13. Perform grade III mobile teeth and deciduous teeth extraction community

2. After completion of the training of Paper – II the students have to:

- 2.1. Perform manual scaling and give oral health education attending at least 2 dental camps
- 2.2. Give oral health education by attending at least 2 school oral health programs
- 2.3. Give education and advice on preventive dental health to the patients/people.
- 2.4. Perform manual scaling at least 10 patients in the community
- 2.5. Prescribe oral medicaments and give oral Science instructions 10 patients.
- 2.6. Give fluoride application on 2 patients.
- 2.7. Perform sterilization and maintenance of dental instruments and materials respectively
- 2.8. Give dietary advice to 5 patients.
- 2.9. Record OHI and CPITN on 10 patients each
- 2.10. Record DMFT on 5 patients.

- 2.11. Perform basic first aid procedures in the community.
- 2.12. Perform Automatic Restorative Treatment (ART) at least 20 patients
- 2.13. Perform grade III mobile teeth and deciduous teeth extraction at least 20 patients

Evaluation scheme:

Evaluation and mark distribution is as follows:

S. N.	Who does evaluate?	Marks
1	Supervisor of the organization in which the student is placed for comprehensive clinical practice (at community)	150
2	The Training Institute	50
3	CTEVT or its nominee (external)	50
	Total	250

Students are required to secure 50 percent marks in the all evaluation separately to pass the course.

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The Council for Technical Education and Vocational Training gratefully acknowledges the expertise and efforts of the following persons who have contributed for the development of the Certificate in Dental curriculum.

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