BLDE
(DEEMED TO BE UNIVERSITY)

Choice Based Credit System (CBCS)

Curriculums

B.Sc. Programme in
Respiratory Care Technology

2020-21

Published by
BLDE
(DEEMED TO BE UNIVERSITY)
Declared as Deemed to be University u/s 3 of UGC Act, 1956

The Constituent College
SHRI B. M. PATIL MEDICAL COLLEGE, HOSPITAL & RESEARCH CENTRE, VIJAYAPURA
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BLDE(DU)/REG/B.Sc.-Bio-Sci/2020-21/ 1876 May 12, 2020

NOTIFICATION

Sub: Curriculum for B.Sc. Programme in Biomedical Sciences with Semester Scheme

Ref: 1. Minutes of the meeting of the 5th Standing Committee Academic Council of the University held on 06- 05-2020.
2. Approval of Board of Management dtd.08-05-2020
3. Approval of Hon'ble Vice-Chancellor vide order no.1834, dtd.09-05-2020

In accordance with the Rule-09 (ii) of the Memorandum of Association (MoA) of the Deemed to be University, the Board of Management (BoM) has approved the Curriculum of **'B.Sc. Programme in Biomedical Sciences'** in 1) Medical Laboratory Technology (MLT), 2) Anaesthesia Technology, 3) Operation Theater Technology, 4) Respiratory Care Technology, 5) Cardiac Care Technology, 6) Perfusion Technology, 7) Emergency Medicine Technology, 8) Optometry, 9) Forensic Science, 10) Clinical Genetics, 11) Audiology & Speech-Language Pathology, following Choice Based Credit System (CBCS) with Semester Scheme.

The Curriculum shall be effective from the Academic Session 2020-21 onwards, in the Constituent College of the University viz. Shri B. M. Patil Medical College, Hospital and Research Centre, Vijayapura.

REGISTRAR
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BLDE (Deemed to be University)
Vijayapura-586103. Karnataka

To,
The Dean, Faculty of Allied Health Sciences,
Shri B. M. Patil Medical College,
Hospital and Research Centre,
Vijayapura

Copy to:
- The Secretary, UGC, New Delhi
- The Dean, Faculty of Medicine & Principal
- The Controller of Examinations
- The Dean, Student Affairs
- The Prof. & HoDs of Pre, Para and Clinical Departments
- The Coordinator, IQAC
- PS to the Hon'ble Chancellor
- PS to the Hon'ble Vice-Chancellor

Vision:

- To be a leader in providing quality medical education, healthcare & to become an Institution of eminence involved in multidisciplinary and translational research, the outcome of which can impact the health & the quality of life of people of this region.

Mission:

- To be committed to promoting sustainable development of higher education, including health science education consistent with statutory and regulatory requirements.
- To reflect the needs of changing technology
- Make use of academic autonomy to identify dynamic educational programs
- To adopt the global concepts of education in the health care sector

Rules and Regulations of Curriculum

B.Sc. Respiratory Care Technology

1. Eligibility for admission

A candidate seeking admission to the Bachelor of Science Degree in Allied Health Sciences [a) to j) above], shall have studied English as one of the principal Course and shall have passed (except for B.Sc. Imaging Technology):

a) Two year Pre-University examination or equivalent as recognized by BLDE(DU), Vijayapura with Physics, Chemistry and Biology as principal Course ofstudy.

OR

b) Pre-degree course from a recognized University considered as equivalent by BLDE(DU), (two years after ten years of schooling) with Physics, Chemistry and Biology as principal Course of study.

OR

c) Any equivalent examination recognized by the BLDE(DU) for the above purpose, with Physics, Chemistryand Biology as principal Course ofstudy.

OR

d) Vocational higher secondary education course conducted by Vocational Higher Secondary Education, Government of Kerala with five Course including Physics, Chemistry, Biology and English in addition to vocational Course conducted, considered equivalent to 'plus - two' [10+2] examinations of Government of Karnataka Pre University Course.

OR

e) Two years diploma from a recognized Government Board in a Course for which the candidate desires to enroll in the respective Allied Health Sciences course and shall have passed 'plus two' [10+2] with Physics, Chemistry and Biology, as principle Course.

OR

f) Three years diploma from a recognized Government Board in a Course for which the candidate desires to enroll in the respective Allied Health Sciences course, with Physics, Chemistry and Biology as principal Course during the tenure of the course.

OR

g) Senior secondary course with Physics, Chemistry and Biology as principal Course of study equivalent to class XII, of open school education system of the centralgovernment and state government approved institutions.

h) In case of B.Sc. Imaging Technology the candidate shall have passed Pre-University or equivalent examination with Physics, Chemistry, Biology and Mathematics, as principal Course of study.

1. Duration of the Programme

Duration shall be for a period of Six semesters (three years) followed by 6 months of internship.

2. Medium of instruction

The medium of instruction and examination shall be English.

3. Attendance

Candidates should have attended at least 75% of the total number of classes conducted in an academic year, from the date of commencement of the term to the last working day, as notified by the University, in each of the Courseprescribed for that year (theory, practical's, and clinical jointly) to be eligible to appear for the University examinations. Candidates lacking prescribed percentage of attendance in any Course shall not be eligible to appear for the University examination in that Course.

4. Internal assessment (IA)

There shall be a minimum of two internal assessment examinations in theory and practical of each core Course spread over evenly in each semester. The average marks of the two IA examinations shall be submitted to the University at least 15 days before the commencement of the University examination. The University shall have access to the records of IA examinations. Candidates have to secure 35% marks in the IA theory and practical jointly in each Course to become eligible to appear for the University examination. The marks of the IA examinations must be displayed on the notice board of the respective departments within a fortnight from the date of IA examination. If a candidate is absent for any of the IA examinations due to genuine and satisfactory reasons, such a candidate may be given a re-examination, within a fortnight.

5. Course and hours of teaching fortheory and practicals

The number of hours of teaching theory and practical, course wise in each semester are shown in table I, II, III, IV, V and VI.

There are three compulsory core Course in each semester. Language, Allied and Skill enhancement Course are mandatory for all courses. Candidates shall select one elective Course each in fifth and sixth semester from the list mentioned in the table VII.

SEMESTER -I							
Course Code	**Course Name**	**Theory hours**	**Credits**	**Practical hours**	**Credits**	**Total hours**	**Total credits**
BRCT 1.1T/P	Anatomy	60	4	20	2	80	6
BRCT 1.2 T/P	Physiology	60	4	20	2	80	6
BRCT 1.3 T/P	Basic Biochemistry	60	4	20	2	80	6
BRCT 1.4	English	30	2	-	-	30	2
BRCT 1.5	Kannada	30	2	-	-	30	2
Total Credits	18 + 2 + 2						

SEMESTER- II							
Course Code	**Course Name**	**Theory hours**	**Credits**	**Practical hours**	**Credits**	**Total hours**	**Total credits**
BRCT 2.1 T/P	Pathology-	60	4	20	2	80	6
BRCT 2.2 T/P	Microbiology	60	4	20	2	80	6
BRCT 2.3 T/P	Pharmacology	60	4	20	2	80	6
BRCT 2.4	Health care	30	2	-	-	30	2
BRCT 2.5	Psychology	30	2	-	-	30	2
Total Credits	18 + 2 + 2						

SEMESTER -III							
Course Code	**Course Name**	**Theory hours**	**Credits**	**Practical hours**	**Credits**	**Total hours**	**Total Credits**
BRCT 3.1 T/P	Applied pathology	60	4	20	2	80	6
BRCT 3.2 T/P	Applied Microbiology	60	4	20	2	80	6
BRCT 3.3 T/P	Introduction to Respiratory Care Technology	60	4	20	2	80	6
BRCT 3.4	Computer application	30	2	-	-	30	2
BRCT 3.5	Environment science and Health	30	2	-	-	30	2
Total Credits	18 + 2 + 2						

SEMESTER- IV							
Course Code	**Course Name**	**Theory hours**	**Credits**	**Modality Posting + Practical's**	**Credits**	**Total hours**	**Total Credits**
BRCT 4.1 T/P	Patient care and basic nursing	60	4	200	2	260	6
BRCT 4.2 T/P	Respiratory Care Technology - Basic	60	4	200	2	260	6
BRCT 4.3 T/P	Basics of Medical Disorders	60	4	200	2	260	6
BRCT 4.4	Biostatistics and Research methodology	30	2	-	-	30	2
BRCT 4.5	Constitution of India	30	2	-	-	30	2
Total Credits	18 + 2 + 2						

SEMESTER- V							
Course Code	**Course Name**	**Theory hours**	**Credits**	**Modality Posting + Practical's**	**Credits**	**Total hours**	**Total Credits**
BRCT 5.1 T/P	Basic Respiratory Therapeutics & Monitoring	60	4	200	2	260	6
BRCT 5.2 T/P	Chest Physical Therapy and Pulmonary Rehabilitation	60	4	200	2	260	6
BRCT 5.3 T/P	Respiratory Care Technology - Clinical	60	4	200	2	260	6
BRCT 5.4	Elective-I	30	2	-	-	30	2
BRCT 5.5	Medical Ethics	30	2	-	-	30	2
Total Credits	18 + 2 + 2						

SEMESTER -VI							
Course Code	**Course Name**	**Theory hours**	**Credits**	**Modality Posting + Practical's**	**Credits**	**Total hours**	**Total Credits**
BRCT 6.1 T/P	Respiratory Care Technology - Applied	60	4	200	2	260	6
BRCT 6.2 T/P	Respiratory Care Technology - Advanced	60	4	200	2	260	6
BRCT 6.3 T/P	Basic Intensive Care	60	4	200	2	260	6
BRCT 6.4	Elective-II	30	2	-	-	30	2
BRCT 6.5	Hospital Management	30	2	-	-	30	2
Total Credits	18 + 2 + 2						

INTERNSHIP										
Course Code	Course Name	Credits/Week				Hrs/semester				
		Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Lecture (L)	Tutorial (T)	Practical (P)	Clinical Posing/ Rotation	Total hrs.
BRCT 7.1	Internship	-	-	-	1440	-	-	-	1440	1440
Total		0	0	0	1440	0	0	0	1440	1440

Table VII: Elective Course

Elective Course	Offering Departments
Fifth Semester	
Immunotechniques in diagnosis of diseases	Pathology and Microbiology
Dental Radiography	Radio diagnosis
Pulmonary Function Testing	Pulmonary Medicine
Telemedicine	Dermatology (Dr Kantharaj)
Hands on training in Continuous ambulatory peritoneal dialysis	Nephrology
Echocardiography (Cardiology)	Cardiology
Echocardiography (CTVS)	Cardio Thoracic Vascular Surgery
Difficult airway intubation	Anesthesiology
Sixth Semester	
Molecular Techniques	Biochemistry
Digital Subtraction Angiography	Radio diagnosis
Polysomnography	Pulmonary Medicine
Practice Management	Health system management studies
Renal Transplant	Nephrology
Coronary angiography	Cardiology
Intra Aortic Balloon pump	Cardio Thoracic Vascular Surgery
Ventilator management	Anesthesiology

Extension Activity

The following extension activities shall be provided for the ability enhancement of the candidates, to provide better health care services. The certificate shall be provided by the offering departments. The Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) shall be as per the American Heart Association guidelines and certification.

Extension Activity	Courses	Semester	Offering departments
Phlebotomy	All courses	III	Anesthesiology
Basic life support *(Optional on payment basis)	All courses	IV	Emergency medicine
Small Project/data Analysis/Industrial visit	All courses	V	Concerned departments of the Course
Advanced cardiac life support *(Optional on payment basis)	Respiratory Care Technology, Emergence Medicine Technology, Anaesthesia and OT Technology, Cardiac Care	VI	Emergency medicine

7. End Semester Examination

a) University examinations (UE): The University shall conduct examination for the core Course at the end of each semester. The candidates, who satisfy the requirement of attendance and internal assessment, shall be eligible to appear for the University examination. The head of the institution shall verify the same before forwarding the applications to the University within stipulated time along with the prescribed fee.

b) Non-University Examinations (NUE): Examination for Languages, Allied Course, Skill enhancement and Elective Course shall be conducted by the college and the marks obtained shall be submitted to the University along with the IA marks of the core Course at least 15 days before the commencement of the University examination. The marks of non-core Course shall be incorporated in the marks card issued bythe University.

c) The candidate must have passed all the previous Course (Core/Language/Skill enhancement/ Allied/elective), to appear for the sixth semester University examination.

8. Scheme of Examination:

Distribution of Course and marks for each semester theory and practical examinations are shown in the Table - VIII, IX, X, XI, XII and XIII.

Table VIII: Distribution of Course and marks for First Semester theory and practical examination

Course Code	Course Name	Theory				Practical			
BRCT 1.1T/P	Anatomy	IA	UE	NUE	Total	IA	UE	NUE	Total
		30	70	-	100	10	40	-	50
BRCT 1.2 T/P	Physiology	30	70	-	100	10	40	-	50
BRCT 1.3 T/P	Basic Biochemistry	30	70	-	100	10	40	-	50
BRCT 1.4	English	-	-	50	50	-	-	-	-
BRCT 1.5	Kannada	-	-	50	50	-	-	-	-

Table IX: Distribution of Course and marks for Second Semester theory and practical examination

Course Code	Course Name	Theory				Practical			
BRCT 2.1 T/P		IA	UE	NUE	Total	IA	UE	NUE	Total
	Pathology	30	70	-	100	10	40	-	50
BRCT 2.2 T/P	Microbiology	30	70	-	100	10	40	-	50
BRCT 2.3 T/P	Pharmacology	30	70	-	100	10	40	-	50
BRCT 2.4	Health care	-	-	50	50	-	-	-	-
BRCT 2.5	Psychology	-	-	50	50	-	-	-	-

Table X: Distribution of Course and marks for Third Semester theory and practical examination

Course Code	Course Name	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
BRCT 3.1 T/P	Applied pathology	30	70	-	100	10	40	-	50
BRCT 3.2 T/P	Applied Microbiology	30	70	-	100	10	40	-	50
BRCT 3.3 T/P	Introduction to Respiratory Care technology	30	70	-	100	10	40	-	50
BRCT 3.4	Computer application	-	-	50	50	-	-	-	-
BRCT 3.5	Environment science and Health	-	-	50	50	-	-	-	-

Table XI: Distribution of Course and marks for Fourth Semester theory and practical examination

Course Code	Course Name	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
BRCT 4.1 T/P	Patient care and basic nursing	30	70	-	10	10	40	-	50
BRCT 4.2 T/P	Respiratory Care Technology - Basic	30	70	-	10	10	40	-	50
BRCT 4.3 T/P	Basics of Medical Disorders	30	70	-	10	10	40	-	50
BRCT 4.4	Biostatistics and Research methodology	-	-	50	50	-	-	-	-
BRCT 4.5	Constitution of India	-	-	50	50	-	-	-	-

Table XII: Distribution of Course and marks for Fifth Semester theory and practical examination

Course Code	Course Name	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
BRCT 5.1 T/P	Basic Respiratory Therapeutics & Monitoring	30	70	-	100	10	40	-	50
BRCT 5.2 T/P	Chest Physical Therapy and Pulmonary Rehabilitation	30	70	-	100	10	40	-	50
BRCT 5.3 T/P	Respiratory Care Technology - Clinical	30	70	-	100	10	40	-	50
BRCT 5.4		-	-	50	50	-	-	-	-
BRCT 5.5	Medical Ethics	-	-	50	50	-	-	-	-

Table XIII: Distribution of Course and marks for Sixth Semester theory and practical examination

Course Code	Course Name	Theory				Practical			
		IA	UE	NUE	Total	IA	UE	NUE	Total
BRCT 6.1 T/P	Respiratory Care Technology - Applied	30	70	-	100	10	40	-	50
BRCT 6.2 T/P	Respiratory Care Technology - Advanced	30	70	-	100	10	40	-	50
BRCT 6.3 T/P	Basic Intensive Care	30	70	-	100	10	40	-	50
BRCT 6.4		-	-	50	50	-	-	-	-
BRCT 6.5	Hospital Management	-	-	50	50	-	-	-	-

Question paper pattern for end semester University theory examinations (70 marks)

I	Long Answers	(Answer 2 out of 3)	2 x 10	= 20
II	Short Essay	(Answer 7 out of 9)	7 x 5	= 35
III	Answer	(Answer all 5)	5 x 3	= 15
		Total =		70 marks

Question paper pattern for end semester Non-University theory examinations (50 marks)

I	Long Answers	(Answer 1 out of 3)	1 x 10	= 10
II	Short Essay	(Answer 5 out of 7)	5 x 5	= 25
III	Answer	(Answer all 5)	5 x 3	= 15
		Total =		50 marks

Examiners

a) Appointment of Examiners
Examiners shall be appointed by the University to conduct the end semester University examinations, from the panel of examiners approved by the Board of Studies. For Practical examinations, there shall be one external examiner and one internal examiner. Theory paper shall be valued by both the examiners.

b) Qualification and Experience of Examiners
For question paper setting and external examiner: Post graduation in the respective field with five years of teaching experience.
For Internal examiners: Post graduation in the respective field with three years of teaching experience.

10. Criteria for pass

Core Course: Candidates are declared to have passed in a Course, if they secure 40% of marks in University examination and internal assessment added together. Theory & practical shall be considered as separate Course. If a candidate passes in practical examination but fails in theory paper, such candidate is exempted from reappearing for practical but shall have to appear in the subsequent examination for the theory paper in which the candidate has failed OR vice versa.

Language papers, allied papers, skill enhancement and elective papers:
The minimum prescribed marks for a pass shall be 35% of the maximum marks prescribed for a Course.

11. Grading of performances

a) Letter grades and grade points allocations
Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given in Table - XIV.

Table - XIV: Letter grades and grade points equivalent to percentage of marks and performances

Percentage of Marks obtained	Letter Grade	Grade Point	Performance
90.00 - 100	O	10	Outstanding
80.00 - 89.99	A	9	Excellent
70.00 - 79.99	B	8	Good
60.00 - 69.99	C	7	Fair
50.00 - 59.99	D	6	Satisfactory
40.00 - 49.99	E	5	Average
Less than 40	F	0	Fail
Absent	AB	0	Fail

A candidate who remains absent for any end semester examination shall be assigned a letter grade of AB and a corresponding grade point of zero. He/she should reappear for the said evaluation/examination in due course.

b) The Semester Grade Point Average (SGPA)

The performance of a student in a semester is indicated by a number called 'Semester Grade Point Average' (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester. For example, if a student takes five courses (Theory/Practical) in a semester with credits C_1, C_2, C_3, C_4 and C_5 and the student's grade points in these courses are G_1, G_2, G_3, G_4 and G_5, respectively, and then students' SGPA is equal to:

$$SGPA = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4G_4 + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

The SGPA is calculated to two decimal points. It should be noted that, the SGPA for any semester shall take into consideration the F and ABS grade awarded in that semester. For example if a learner has a F or ABS grade in course 4, the SGPA shall then be computed as:

$$SGPA = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4 * ZERO + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

c) Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the VIII semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VIII semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s), till the course(s) is/are passed. When the course(s) is/are passed by obtaining a pass grade on subsequent examination(s) the CGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

$$CGPA = \frac{C_1S_1 + C_2S_2 + C_3S_3 + C_4S_4 + C_5S_5 + C_6S_6 + C_7S_7 + C_8S_8}{C_1 + C_2 + C_3 + C_4 + C_5 + C_6 + C_7 + C_8}$$

where C_1, C_2, C_3,…. is the total number of credits for semester I,II,III,…. and S_1, S_2, S_3,….is the SGPA of semester I,II,III,…. .

12. Declaration of class

The class shall be awarded on the basis of CGPA as follows:

First Class with Distinction	= CGPA of 7.50 and above
First Class	= CGPA of 6.00 to 7.49
Second Class	= CGPA of 5.00 to 5.99
Pass Class	= CGPA of 4.00 to 4.99

13. Carry over

A candidate should pass all the Course (core/language/skill enhancement/ allied/elective) of first semester, to enter into the third semester. Similarly, second semester Course should be cleared before entering fourth semester and third semester Course should be cleared before entering fifth semester. However, the candidate must have passed all the previous Course (core/language/skill enhancement/ allied/elective) to appear for the sixth semester University examination.

14. Internship

Twelve months (one year) internship shall be mandatory after successful completion of sixth semester examination. The 'Internship Completion Certificate' shall be issued bythe college and copyof same is submitted to the University.

15. Award of Ranks/Medals

Ranks and Medals shall be awarded onthe basis of final CGPA. However, candidates who fail in one or more Course during the course shall not be eligible for award of ranks.

16. Award of degree

A candidate who has passed in all the Course (core/language/allied/skill enhancement/elective papers) of all the semesters and has successfully completed the internship shall be eligible for award of degree.

17. Revaluation and Re-totaling of answer papers

There is no provision for revaluation of the answer papers in any examination. However, the candidates can apply for re-totaling by paying prescribed fee.

18. Maximum duration for completion of course

A candidate shall complete the course within six years from date of admission, failing, which candidate shall re-register for the course.

SEMESTER- I
BRCT 1.1T/P Anatomy

Objectives:

At the end of the course the student Should be able to:

- Describe the structure, composition and functions of the organ systems of human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.

Learning Objectives: Skills

- Use the process of prosection to investigate anatomicalstructure.
- Use the microscopeto learn anatomical or histologicalstructure.
- Learnhowto study, interpret and care for anatomical specimens.

Contents Theory:

Unit I

Organization of the Human Body **12hrs**

Introduction to the human body Definition and subdivisions of anatomy Anatomical position and terminology

Cell - Definition of a cell, shapes and sizes of cells

- Parts of a cell - cell membranes, cytoplasm, sub cellular organelles.

  Cell Division - Definition and main events in different stages of mitosis and meiosis.

Tissues - Tissues of the body

- Definition and types of tissues
- Characteristics, functions and locations of different types of tissues
- Epithelial tissue - definition, classification with examples
- Glands- classification with examples

Unit II

Locomotion and Support **12hrs**

1. **Cartilage - Typeswith examples**
2. **Skeletal system**

   Skeleton - Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Marking of bones. Functions of bones.Development (types and ossification) and growth of bone.Name, location and general features of the bones of the body.

   Joints - Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, ligaments, movements possible and the muscles producing such movements of the joints of the body.

3. Muscularsystem

Parts of the Skeletal muscle. Definition of origin and insertion. Classification of muscular tissue. Compartment muscles of upper limb, lower limb, sternocleidomastoid

Unit III

Maintenance of the Human Body **12hrs**

1. Cardio-vascularsystem

Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall. Conducting system and blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of major arteries and veins.

2. Lymphatic system

Lymph, lymphatic vessels, name, location and features of the lymphoid organs.

3. Respiratory system

Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

4. Digestive system

Names of organs of digestion. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder

Unit IV

1. Urinary system and Reproductive system **12hrs**

Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord.

Location and features of uterus & its supports, uterine tube, ovary& mammarygland.

2. Development

Gametes, period of gestation, gametogenesis, structure of sperm and ovum, growth of ovarian follicles, events of 1^{st}, 2^{nd} and 3^{rd} weeks of development, folding of embryo. Derivatives of germ layers, placenta

Unit V

Control Systems of the Body **12hrs**

1. Nervous system

Sub-divisions of the nervous system

Brain - Sub-divisions, location external features and internal structure of medulla oblongata, pons, mid-brain, cerebellum and cerebrum.

Spinal cord - Location, extent, spinal segments, external features and internal structure. Location and features of thalamus and hypothalamus.

Locations and subdivisions ofbasalganglia. Meninges and spaces around them. Name and locationofventricles of brainand circulation ofcerebrospinal fluid. Blood supplyof the brain and spinal cord. Cranial nerves

2. Sense organs

Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by eachgland.

Practical :

1. Demonstration ofpartsof microscope and its uses
2. Demonstration ofskeleton and joint
3. Demonstration ofdeltoid and gluteus maximus, Cubital fossa
4. Demonstration of heart and its blood supply, demonstration of major arteries of upper limband lower limb, histologyofcardiac muscle and histologyof vessels
5. Demonstration of location and parts of lungs, histologyoftrachea and lungs
6. Demonstration of location of stomach, small and large intestines. Location and features ofpancreas, liver and gall bladder
7. Demonstration of location and features of kidney, ureter, urinary bladder and urethra. Histologyof urinarysystem excepturethra
8. Demonstration of locationof male and female reproductive organs
9. Demonstration of brain and spinal cord
10. Histologyof cornea and retina

Practical Examination Pattern **40 Marks**

1. Gross Anatomy- Discussion ofanyone specimen -10 Marks

   Disscusion of specimens of Cardiovascular system, Respiratory System, Gastrointestinal system, Urinary system, Reproductive system
2. Spotters - Cardiovascular system, Respiratory System, Gastrointestinalsystem, Urinarysystem, Reproductive system- 10x2=20 Marks
3. Histologydiscussion ofanyone demonstrated slide - 10 Marks

Recommended Books Recent Editions:

1. Ross and Wilson: Anatomyand Physiology in Health and illness
2. Understanding HumanAnatomyand Physiology, William Davis (p) MC Graw Hill
3. Essentials of Human Embryology. Bhatnagar, Orient Blackswan Pvt. Ltd.
4. Anatomy for B.Sc Nursing by Renu Chauhan. Arichalpublishing company 2012
5. Hand bookofAnatomy BD Chaurasia
6. Basics in Human Anatomy for B.Sc. Paramedical Courses 1st edition 2008 Jaypee Publishers

Reference books:

1. B D Chaurasia: Regional Anatomy. VolI, II, III 6th edition

BRCT 1.2 T/P Physiology

Objectives

At the end of the semester students should be able to describe

1. Blood cellcounts
2. Nerve and muscle functions
3. Cardiac functions
4. Pulmonary functions
5. Renal functions
6. The actions of various hormones
7. Functions of Centralnervous systemand special senses

Contents: Theory

Unit -I

General physiology and Blood **12 Hrs**

General Physiology (2 Hrs)

- Organization ofthe celland its function, homeostasis
- Transport across cell membrane
- Membrane Potentials - Resting Membrane Potential &Action Potential
- BodyFluid Compartments - Normal Values

Blood (10 Hrs)

- Introduction: composition and function ofblood.
- Red blood cells: erythropoiesis, stages of differentiation, function, count, physiological variation.
- Structure, function, concentration, physiological variation, methods ofestimation of haemoglobin.
- White blood cells: production, function, count.
- Platelets: origin, normal count, morphology& functions.
- Plasma proteins: types, functions
- Haemostasis: definition, normal haemostasis, clotting factors, mechanism of clotting, disorders of clotting - Blood groups: ABO system, Rh system. Blood grouping & typing, cross matching.

  Rh system: Rh factor, Rh incompatibility. Blood transfusion: indication. transfusion reactions.
- Anticoagulants: classification, examples and uses.

  Anaemias: morphological and etiological classification, -Blood indices: CI, MCH, MCV, MCHC.
- Erythrocyte sedimentation rate (ESR) and packed cell volume, normal values.

Unit -II

Digestive system & Respiratory system **12hrs**

Digestive System (4Hrs)

- Physiological anatomyof gastro intestinaltract, functions ofdigestive system.
- Salivaryglands: structure and functions, deglutition: stages and regulation.
- Stomach: structure and functions. Gastric secretion: composition function regulation of gastric juice secretion.
- Pancreas : structure, function, composition of pancreatic juice
- Functions of liver. Bile secretion, composition, function. jaundice: types.
- Functions of gall bladder.
- Small intestine: functions, digestion, absorption, movements.
- Large intestine: functions, movements defecation

Respiratory system (8 Hrs)

- Functions of respiratory system, physiological anatomy of respiratory system, respiratory tract, respiratory muscles.
- Mechanism of normal and rigorous respiration, forces opposing and favoring expansion ofthe lungs. Intra pulmonary & intrapleuralpressure.
- Surface tension, recoil tendency of the thoracic cage and lungs .
- Transport of respiratory gases: transport of oxygen & carbon dioxide, oxy haemoglobin dissociation curve, factors affecting it.
- Lung volumes and capacities - normal values
- Regulation of respiration: mechanisms of regulation, nervous and chemical regulation, respiratorycentre.
- Applied physiology: hypoxia, cyanosis, dyspnoea, apnoea.

Unit -III

Cardiovascular and Endocrine system **12hrs**

Cardiovascularsystem (7Hrs)

- Heart: Physiological Anatomy, Nerve supply.
- Properties ofcardiac muscle, cardiac cycle:
- Conducting Systemof Heart, Origin and Spread ofCardiac Impulse
- Electrocardiogram(ECG) waves and normal duration. Recording
- Cardiac Cycle: Phases and VolumeChanges
- Normal heart sounds, areas ofauscultation. Pulse: jugular, radialpulse,
- Cardiac output : definitions of stroke volume, cardiac index, factors Affecting It. measurement of Cardiac output.
- Generalprinciples ofcirculation
- Blood pressure: definition, normal value, clinical measurement of blood pressure, hypotension, hypertension. Factors affecting it and regulation
- Physiological variations & regulation of heart rate.

Coronarycirculation.

- Shock

Endocrine System (5 Hrs)

- Classification ofendocrine glands & Definition of hormone.
- Pituitaryhormones: anterior and posterior pituitary hormones, secretion, functions
- Thyroid gland: physiological anatomy, hormone secreted, physiologicalfunction, regulation, secretion, disorders (hypo and hyper secretion ofhormone).
- Adrenal cortex: physiological anatomy. cortical hormones, functions and regulation.
- Adrenal medulla: hormones, regulation and secretion. Functions of adrenaline and nor adrenaline.
- Hormones ofpancreas. Insulin: secretion, regulation, functionand action.

  Diabetes mellitus: regulationofblood glucose level.
- Parathyroid gland: function, action, regulation of secretion ofparathyroid hormone.

Calcitonin:

Unit -IV

Excretory systemand Reproductive system 12 hrs

Excretory System (8Hrs)

- Functional anatomy ofkidney
- Juxta glomerular apparatus: structure and function.
- Glomerular filtration
- Tubular function(reabsorption and secretion)
- Micturition, innervation ofbladder, cystometrogram.
- Artificial kidney, renal function tests skinand bodytemperature

Reproductive system (4Hrs)

- Male reproductive system: functions of testes, spermatogenesis: Endocrine functions of testes -Female reproductive system: oestrogen, progesteron, menstrual cycle: ovulation, physiological changes during pregnancy, pregnancy tests.
- Lactation: composition of milk, factors controlling lactation.

Unit -V

Muscle nerve physiology, Nervous systemand Specialsenses 12hrs

Muscle nerve physiology (3Hrs)

- Classification and properties of neuron and neuroglia. Classification of nerve fibers
- Classification of muscle, structureof skeletal muscle,
- Neuromuscular junction. Transmission across nmj
- Excitation contraction coupling. muscle tone, fatigue, rigor mortis

Nervous system (5Hrs)

- Organisation ofnervous system
- Synapse: structure, types, properties.
- Receptors: definition, classification, properties. Sensations-pain
- Organization Spinal cord. Ascending tracts, descending tracts.
- Reflex: definition reflex arc, clinical classification of reflexes : Babinski's sign.
- Hypothalamus- functions
- Cerebral cortex lobes - functions,
- Cerebellum- functions
- Basal gangliafunctions.
- Cerebro Spinal Fluid (CSF) : formation, circulation & reabsorption . composition and functions. Lumbar puncture.
- Autonomic Nervous System: Sympathetic and parasympathetic distribution

Special senses (4Hrs)

- Vision: structure of eye, function of different parts. Structure of retina. visual pathway, errorsofrefraction
- Hearing: structure and functions ofear.
- Taste: taste buds and taste pathway.
- Olfaction : receptors, pathway.

Practicals (20 Hrs)

1. Haemoglobinometry.
2. Haemocytometry
3. Total leucocytecount.
4. TotalRed blood cell count.
5. Determination ofblood groups.
6. Differential WBC count.
7. Determination ofclotting time, bleeding time.
8. Erythrocyte sedimentation rate (ESR). Determination of packed cell Volume, Calculation of Blood indices: CI, MCH, MCV, MCHC.
9. Blood pressure recording.
10. Spirometery, Artificial Respiration

Practical Examination : 40 Marks

1. Estimation of Hemoglobin. - 10 marks
2. Determination of Blood Groups. - 10 marks
3. Determination of Bleeding and Clotting time. - 10 marks
4. Spotters-Haemocytometer, (Identification of cells) Differential Count, Sphygmomanometer, Spirometer . - 10 marks

Recommended Books Recent Editions

1. A.K.Jain, Human Physiology and Biochemistry for Physical Therapy and Occupational Therapy, 1st Ed. Arya Publication.
2. Dr. Venkatesh.D and Dr. Sudhakar H.S.Basic of Medical Physiology, 2nd Ed., Wolter-Kluwer Publication.
3. Chaudhari (Sujith K) Concise Medical Physiology 6th Ed. New Central Book.

Reference Books

1. A.K.Jain, Text book of Physiology for Medical Students, 4th Ed. Arya Publiction.
2. Guyton (Arthur) Text Book of Physiology.11th Ed. PrismPublishers.
3. Ganong (William F) Review of Medical Physiology. 23rd Ed . Appleton.

BRCT 1.3 T/P Basic Biochemistry

Unit I **12hrs**

Chemistry of Cell & Chemistry of Carbohydrates, Proteins, Lipids &Nucleotides-

Cell- Structure & Function of Cell Membrane, Subcellular Organelles and their Functions.

Carbohydrates- Definition, Classification & Biological importance of carbohydrates, Derivatives of Monosaccharides.

Proteins- Definition & Classification of amino acids & Proteins, Biologically important peptides Plasma proteins, Immunoglobulins.

Lipids- Definition, Classification & Biological importance and Functions of Lipids. Structure and functions of Cholesterol, types and functions of Lipoproteins.

Nucleotides- Structure and Functions of DNA & RNA. Biologically important nucleotides.

Unit II **12hrs**

Enzymes & Acid base balance

Enzymes- Definition and Classification. Factorsaffecting enzyme activity. Coenzymes and Cofactors. Enzyme inhibition & Regulationofenzyme activity

Acid Base balance- Acids, Bases & Body Buffers, Regulation of pH, Acid base disorders.

Unit III **12hrs**

Vitamins& Minerals

Vitamins-Classification, Sources, RDA, Functions(in brief), deficiency manifestations and hyper vitaminosis.

Minerals- Classification, Sources, RDA, Functions (in Brief), deficiency manifestations ofthe following: calcium, phosphorous, iron, copper, iodine, zinc, fluoride, magnesium, selenium, sodium, potassium and chloride.

Unit IV **12hrs**

Nutrition, Blood chemistry & Urine Chemistry

Nutrition- Nutrients, Calorific value of food, BMR, SDA, respiratory quotient and its applications, Balanced diet based on age, sex and activity, biological value of proteins, nitrogenbalance, Protein energymalnutrition, Totalparenteral nutrition, dietary fibers.

Blood chemistry- Biochemical components & their reference ranges in normal & diseased states.

Urine chemistry- Biochemical components & their reference ranges in normal & diseased states

Unit V **12hrs**

Clinical Biochemistry- 10 hrs

Specimen Collection- Blood, Urine and Bodyfluids.

Preanalytical, analytical and postanalytical errors

Clinical Biochemistry- Parameters to diagnose Diabetes & Cardiovascular diseases.

Diagnostic enzymology, Assessment of arterial Blood gas status and electrolyte balance, Point of Care Testing. Renal Function tests(in brief), Liver function tests(in brief), BiomedicalWaste Management.

Practicals

1. General Reactions of Carbohydrates.
2. Color reactions of Proteins.
3. Reactions of Non Protein nitrogenous substances.
4. Demonstration of pH meter, Colorimeter and spectrophotometer.
5. Demonstration of Chromatography and Electrophoresis.

Practical Examination

1. Identification of Substance of physiological importance - 10 Marks
2. Color reactions of Proteins - 10 Marks
3. Spotters - 10 Marks
4. Charts on Clinical biochemistry - 10 Marks

Recommended books Recent edition

1. Textbook of Biochemistry-D.M.Vasudevan
2. Biochemistry -Pankaja Naik
3. Clinical Biochemistry-Principles and Practice-Praful.B.Godkar
4. Textbook of Biochemistry-Chatterjea and Shinde
5. Textbook of Clinical Chemistry-Norbert W Teitz

Reference Books Recent Edition

1. Harpers Biochemistry
2. Clinical Biochemistry-Michael L.Bishop
3. Textbook of Biochemistry-Rafi M.D
4. Lippincott's Illustrated review of Biochemistry
5. Practical Clinical Biochemistry-Harold Varley

BRCT 1.4 Language 1English

Unit I

Introduction

a) Study Techniques - Reading Comprehension

Exercises on reading passages and answering questions based on the passage.

b) Organization of Effective Note Taking

Why good note-taking is important

Effective note-taking is an important practice to master at university. You have a lot of new knowledge and you need to develop reliable mechanisms for recording and retrieving it when necessary. But note-taking is also a learning process in itself, helping you to process and understand the information you receive.

c) Use of the Dictionary

Tips on how to use the dictionary

1. Choose the right dictionary.
2. Read the introduction.
3. Learn the abbreviations.
4. Learn the guide to pronunciation.
5. Looking Up a Word
   a) Find the section of the dictionary with first letter of your word.
   b) Read the guide words.
   c) Scan down the page for your word.
   d) Read the definition.
6. Online dictionaries
7. Research various facts.
8. Thesaurus

It is a dictionary of synonyms and antonyms, such as the online Thesaurus.com.

Enlargement of Vocabulary

Roots : A to G Effective Diction

Foreign Expressions - meaning and pronunciation

Unit II

Applied Grammar

a) Correct Usage

The Eight Parts of Speech

1. Noun
2. Pronoun
3. Adjective
4. Verb
5. Adverb
6. Preposition
7. Conjunction
8. Interjection

b) The Structure of Sentences

What is a sentence?

What are clauses?

What are phrases?

Types of sentences:

1. Simple sentences
2. Compound sentences
3. Complex sentences

c) The Structure of Paragraphs

1. What is a Paragraph?

Paragraphs are comprised of sentences, but not random sentences. A paragraph is a group of sentences organized around a central topic.

2. The Secrets to Good Paragraph Writing:

Four Essential Elements

The four elements essential to good paragraph writing are: unity, order, coherence, and completeness.

4. Paragraph Structure

A paragraph consists of 3 main structures :

1. Claim
2. Evidence
3. Analysis

d) Enlargements of Vocabulary

Roots: H to M

Unit III

Written Composition

a) Precise writing and Summarizing

1. Definition of precise:

A precise or summary is an encapsulation of someone's writing or ideas.

Technically it should be one - third the length of the actual passage given.

2. Definition of summary:

Summaries may not always follow a direct line through what they're summarizing - if you want to summarize someone else's ideas in a few sentences, it might make more sense if you begin with their conclusion, and work back to the arguments they use to develop thatconclusion.

Guidelines to follow while writing a summary are:

1) Divide…and conquer.
2) Read.
3) Reread.
4) One sentence at a time.
5) Write a thesis statement.
6) Check for accuracy.
7) Revise.

b) Writing of a Bibliography

I. What isa bibliography?

A bibliography is an alphabetical list of all materials consulted in the preparation of your assignment.

II. What is anannotated bibliography?

An annotated bibliography is an alphabetical list of books or articles for which you have added explanatoryor critical notes.

III. Why you must do a bibliography?

a) To acknowledge and give credit to sources of words, ideas, diagrams, illustrations and quotations borrowed, or any materials summarized or paraphrased.

b) To show that you are respectfully borrowing other people's ideas, not stealing them, i.e. to prove that you are not plagiarizing.

IV. What must be included in a bibliography?

- author
- title
- place of publication
- publisher
- date of publication
- page number(s) (for articles from magazines, journals, periodicals, newspapers, encyclopedias, or inanthologies).

V. Writing a bibliography in MLA style

1. Standard Format for a Book:

Author. Title: Subtitle. City or Town: Publisher, Year of Publication.

If a book has no author or editor stated, begin with the title. If the cityor town is not commonly known, add the abbreviation for the State or Province.

2. Standard Format for a Magazine, Periodical, Journal, or Newspaper Article:

Author. "Title: Subtitle of Article." Title of Magazine, Journal, or

Newspaper Day, Month, Year of Publication: Page Number(s).

c) Enlargement of Vocabulary Roots - N to S

Unit IV

Reading and Comprehension

a) Review of selected materials and express oneself in one's words

Seminar for students on powerpoint presentation and book review.

b) Enlargement of Vocabulary

Roots - T to Z

Unit V

The study of Varioius forms of Composition

a) Paragraph

Exercises for students on short paragraph topics.

b) Essay

How to Write an Essay

The writing of an essay has three stages :

1. Essay writing
2. Close reading
3. Research

c) Letter

Mechanics of writing formal and business letters.

Exercises on writing letters for students.

d) Summary

Writing reports: project report, magazine article and reporting in newspapers on sporting events.

e) Practice In Writing

Exercises and assignments on report writing for students.

Unit VI

Verbal Communication

a) Discussions And Summarization

Tips on taking minutes of a meeting

Why Meeting Minutes Matter

Meeting minutes are important. They capture the essential information of a meeting - decisions and assigned actions. The following instructions will help you take useful and concise meeting minutes.

Before the Meeting

If you are recording the minutes, make sure you aren't a major participant in the meeting. You can't perform both tasks well.

Create atemplate for recording your meeting minutes and make sure you leave some blank space to record your notes.

Decide how you want to record your notes. If you aren't comfortable relying on your pen and notepad, tryusing a tape recorder or, if you're a fast typist, take a laptop to the meeting.

During the Meeting

As people enter the room, check off their names on your attendee list. Ask the meeting lead to introduce you to meeting attendees you aren't familiar with. This will be helpful later when you are recording assigned tasks or decisions.

After the Meeting

Review the notes and add additional comments, or clarifywhat you didn't understand right after the meeting.

a) Debates

Group Discussions:

1. **Do's in a group discussion:**

- Be confident. Introduce yourself with warm smile and get into topic soon.
- Have eye contact with all group members
- Learn to listen.
- Be polite.
- Be a good team player. Move with all group members and help them when needed.

2. **Don'ts in a group discussion:**

- Don't be harsh when you are interrupted.
- Don't interrupt the other person
- Don't try to push your ideas onothers.
- Don't argue. Everyone is free to express their ideas.

c) Oral Reports

An oral report is a presentation, usually done for a student's teacher and classmates, though it can also be done for a larger segment of the school community, for parents, or for a more open group, depending on the circumstances. For example, at a science fair, a student might present a report on his or her project periodically for the class, for other visitors who pass by, and for judges.

d) Use in Teaching

Writingofdialogues

Originating from dialogos, the Greek word for conversation, the term dialogue refers to a verbal conversation between two or more people.

When writing dialogues, it is important to adhere to specific grammar rules. The following points need to be remembered while writing dialogues for roleplay.

1. Quotation Marks
2. Periods
3. Question Marks
4. Commas
5. Capitalization and Paragraphs
6. How Dialogue Enhances Writing

Dialogue reveals information about the speaker(s) within a written work. Dialogue also enhances the story line and plot.

a) Exposes Character Traits

Through indirect characterization, dialogue reveals details about a character by what they say, how they say it, and perhaps what they choose not to say.

b) Unveils Mood/Emotions

A character's word choice, description of tone, and choice of language reveal the inner state of the character without directly "telling" the audience. Showing instead of telling creates a deeper understanding of the character through the eyes of the reader or audience.

c) Reveals Motivation/Influences

Dialogue can illuminate a character's internal motivation or desires.

d) Establishes Relationships

Seeing how a character addresses and responds to other characters shows the type of relationships that they form and where their relationships currently stand. Dialogue can demonstrate how relationships change throughout the course of the story. It can show how a character changes or responds to various situations.

Exercises for students on preparing a dialogue exchange between two people

1. On the street (with a vegetable vendor)
2. At college with a lecturer (regarding admissions)
3. In a bank with the manager (for opening a bank account)
4. Telephone conversation with a hotel receptionist (make room reservations)
5. Telephone conversation (taking an appointment with the dentist/doctor)

SEMESTER- II

BRCT 2.1 T/P General Pathology

Unit I

Introduction- & scope of pathology **12hrs**

Cell injury and Cellular adaptations - Normal cell, Cell injury - types, etiology, morphology, Cell death-autolysis, necrosis, apoptosis, Cellular adaptations-atrophy, hypertrophy, hyperplasia, metaplasia.

Inflammation-Introduction, acute inflammation-vascular events, cellular events, chemical mediators, chronic inflammation-general features, granulomatous inflammation, tuberculosis.

Healingand repair - Definition, different phases of healing, factors influencing wound healing, fracturehealing.

Haemodynamic disorders-Oedema, hypermia, congestion, haemorrhage, embolism, thrombosis, infarction.

Neoplasia - defintion, nomenclature, features ofbenign and malignant tumors, spreadof tumors, dysplasia, carcinoma in situ, precancerous lesions.

Environmental and nutritional pathology - smoking, radiation injury, malnutrition, obesity, vitamin deficiencies.

Unit II

Haematological Disorders **12hrs.**

Introduction and Haematopoiesis

Anaemia - introduction and classification (morphological and etiological), iron deficiency anemia: distribution of body iron, iron absorption, causes of iron deficiency , lab findings, megaloblastic anamia: causes, labfindings, haemolytic anemias: definition. Causes, classification and labfindings.

WBC disorders - quantitative disorders, leukemia - introduction and classification, acute leukemias, chronic leukemias.

Bleeding disorders - introduction, physiology of hemostasis. Classification, causes of inherited and acquired bleeding disorders, thrombocytopenia, DIC, laboratory findings. Pancytopenia.

Unit- III

Basic Hematological Techniques **12 hrs**

Characteristics of good technician, Blood collection - methods (capillary blood, venipuncture, arterial puncture) complications, patient after care, anticoagulants, transport of the specimen, preservation, effects of storage, separation of serum and plasma, universal precautions, complete hemogram - CBC, peripheral smear, BT, CT, PT, APTT, ESR, disposal of the waste in the laboratory.

Unit IV

Transfusion Medicine **12 hrs**

Selection of donor, blood grouping, Rh typing, cross matching, storage, transfusion transmitted diseases, transfusion reactions, components - types, indications.

Unit V

Clinical Pathology **12 hrs**

Introduction to clinical pathology- collection, transport, preservation, and processing of various clinicalspecimens.

Urinalysis - collection. Preservatives, physical, chemical examination and microscopy. Physical examination; volume, color, odor, appearance, specific gravity and ph, Chemical examination; strip method- protein - heat and acetic acid test, sulfosalicylic acid method, reducing sugar-benedicts test, ketone bodies - rotheras test, bilepigments fouchet method, bile salt - hays method, blood - benzidine test, urobilinogen and porphobilinogen- ehrlich aldehyde and schwartztest, bence jones protein., microscopy.

Examination of cerebrospinal fluid - physical examination, chemical examination, microscopic examination, examination of body fluids (pleural, pericardial and peritoneal), physical examination, chemical examination, microscopic examination, sputum examination.

Practicals:

Laboratory organization-

Receptionofspecimen, dispatchof reports, records keeping, coding ofcases.

Laboratorysafetyguidelines.

SI units and conventionalunits in hospital laboratory.

Haematologytechniques

Basic requirements for hematologylaboratory

Glasswares forhematology

Equipments for haematology.

Anticoagulant vials

Complete blood counts.

Determination of haemoglobin.

RBC count and TLC by hemocytometer.

Differential leukocytecount.

Determination of platelet count

Determination of ESR and PCV.

Erythrocyte Indices - MCV, MCH, MCHC.

Reticulocyte count

Absolute eosinophilic count

Morphology of blood cells

Urinanalysis

Examination of cerebrospinal fluid

Examinationof bodyfluids (pleural, pericardial, peritoneal)

Sputumexamination.

Practical Examination- 40 marks.

Spotters- 10 marks.

Estimation of Haemoglobin or blood grouping- 10 marks.

Urine analysis- 10 marks.

Determination of ESR and PCV- 10 marks.

1.Recommended Books Recent Editions.

1. Basic Pathology Robbins Saunders, an imprint of Elsevier Inc., Philadelphia, USA.
2. Text book of Pathology Harsha Mmohan Jaypee Brothers, New Delhi.
3. Practical Pathology P. Chakraborthy, Gargi Chakarborty New Central book agency, Kolkata.
4. Text book of Haematology Dr Tejinder Singh Arya Publications, Sirmour (H P)
5. Text book of Medical Laboratory Technology Praful Godkar Bhalani Publications house, Mumbai.
6. Textbook of Medical Laboratory Technology Ramanik Sood.
7. Practical Haematology Sir John Dacie Churchill Livingstone, London.
8. Todd and Sanford, Clinical Diagnosis and Management by Laboratory
9. Methods John Bernard Henry, All India Traveller Bookseller.
10. Histopathology Techniques, Culling.
11. Histopathology Techniques Bancroft.
12. Diagnostic Cytopathology Koss.
13. Diagnostic Cytopathology Winfred Grey.
14. Hand book of Medical Laboratory Technology, CMC Vellore.
15. Basic Haematological Techniques Manipal

BRCT 2.2 T/P Microbiology

Unit - I

General Microbiology **12 hrs**

1. Morphology and classification of microorganisms.
2. Growth, nutrition and multiplication of bacteria
3. Sterilization and Disinfection - Principles and use of equipments of sterilization namely hot air oven, autoclave and serum inspissator, pasteurization, antiseptics and disinfectants
4. Immunology - antigen, Antibodies, Immunity, vaccines, types of vaccine and immunization schedule.
5. Hospital acquired infection - Causative agents, transmission methods, investigation, prevention and control of hospital Acquired infections.

Unit - II

Bacteriology **12 hrs**

Classification of bacteria, morphology, infections, lab diagnosis, treatment and prevention of common bacterial infections. Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Corynebacterium diphtheriae, Clostridia, Enterobacteriaceae - Shigella, Salmonella, Klebsiella, E.coli, Proteus, Vibrio cholerae, Pseudomonas and Spirochetes

Unit III

Mycobacteriology& Parasitology **12 hrs**

Mycobacteria- classification, pathogenesis, lab diagnosis and prevention

Classification, infections and labdiagnosis of following parasites. Entamoeba, Giardia, Malaria, Hookworm, Roundworm and Filarialworms.

Unit IV

Mycology **12 hrs**

Morphology, disease caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi (Aspergillus, Zygomycetes and Penicillium)

Unit V

Virology **12 hrs**

General properties of viruses, diseases caused lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Dengue, Influenza, Chikungunya, Rabies and Poliomyelitis.

Practicals: 20 hours

1. Compound microscope and its application in microbiology.
2. Demonstration of sterilization equipments: hot air oven, autoclave, bacterial filters. Demonstration of commonly used culture media, nutrient broth, nutrient agar, blood agar, chocolate agar, Mac conkey medium, L J media, Robertson cooked meat media, MacConkey agar with LF & NLF, Nutrient agar with staph colonies.Anaerobic culture, Methods and Antibiotic susceptibility test.
3. Demonstration of common serological tests: Widal, VDRL, ASLO, CRP, RF, Rapid tests for HIV, Hbsag and HCV.
4. Grams staining.
5. Acid fast staining.
6. Principles and practice of Biomedical waste management.
7. Stool Microscopy.

Practical examination pattern

Spotters (10 spotters carrying 2 marks each) 20 marks
Culture media - 6
Equipments - 2
Slides - 2
Discussion:
1. Gram stain 10 marks
2. Ziehl - Neelsen stain 10 marks

Recommended Books Recent Editions.

1. Anathanarayana & Panikar: Medical Microbiology - Revised 8th edition University Press.
2. Parasitology by Chatterjee - Interpretation to Clinical Medicine.
3. Textbook of Microbiology - Baveja, 5th edition, Arya Publications
4. Textbook for Laboratory technicians by RamnikSood. Jaypee Publishers
5. Textbook of Parasitology by Paniker. 7th edition

BRCT 2.3 T/P Pharmacology

Unit I

General Pharmacology, ANS, PNS. 12 Hrs

Sources of Drugs
Route of drug administration
Pharmacokinetics (Absorption, Metabolism, Distribution, Excretion)
Pharmacodynamics (Mechanisms of action)
Adverse drug reactions
ANS : ADRENERGIC Drugs - Adrenaline, Noradrenaline, Ephidrine, Dopamine, Dobutamine
Anti adrenergic - Phentolamine, Phenoxybenzamine, Prazocin, Tamsulosin, Propranolol, Atenolol, Carvidelol
Cholinergic drugs-Acetyl choline, Pilocarpine, Neostigmine, Organophosphorous compounds
Anti cholinergic agents-Atropine, Glycopyrrolate, Ipratropium Bromide, Dicyclomine

Unit II

PNS, CVS, Renal System 12 hrs

Skeletal muscle relaxants - D Tubocurarine, Succinyl choline, Diazepam, Dantroline
Local anaesthetics - lignocaine, la + vasoconstrictor
CVS - ionotropic agents -
Digoxin, Antianginal drugs -
GTN,
Antihypertensives - Betablockers (Propranolol, Atenolol, carvidelol), CCBs (Nifedeine), Diuretics (Thiazide, Furesemide, ace inhibitors, ARBs, Clonidine
Drugs used in treatment of different types of shock, Plasma expanders
Renal system - Diuretics Furosemide, Thiazide, Spiranolactone
Antidiuretics - Vasopressin

Unit III

CNS, Blood 12 hrs

CNS - general Anaesthetics - nitrous oxide, Halothane, iv anaesthetics
Sedative hypnotics - diazepam, barbiturates, zolpidem
Antiepileptics - Phenytoin, carbamezapine, phenobarbitone, valproate
Opioid analgesics - morphine, pethidine, codiene
NSAIDS - Aspirin, Diclofenacibuprofen, Selective COX2 inhibitors
Respiratory system-treatment of cough And Bronchial asthma
Blood - Hematinics, Anticoagulants - Warfarin, Heparin
Thrombolytics & Antiplatelet drugs - streptokinase,/ aspirin, clopidogrel

Unit IV

GIT, Chemotherapy **12 hrs**

GIT - drugs used in peptic ulcer - ppi, H2 blockers, Antacids
Antiemetics - Metaclopromide, Domperidone, Ondensetron
Purgatives & Laxatives-bran, ispaghula, Lactulose, Bisacodyl &senna
Drugs used in Diarrhoea- ORS, Super ORS, Antimotility drugs (loperamide, diphenoxylate)
Chemotherapy - general considerations MOA, Resistance, Prophylaxis
Sulfonamides, cotrimoxazoles, Quinolones
Tetracyclines, chloramphenicol
Betalactam antibiotics

Unit V

Chemotherapy, Hormones. **12 hrs**

Aminoglycosides
Macrolides, other antibiotics (vancomycin, linezolid) & treatment of UTI
Antifungal (clotrimazole, flucanozole)
Antiviral (Acyclovir, Few drugs used in HAART,)
Cancer chemotherapy
(names, common Adverse effects, general principles in the treatment of cancer)
Hormones - Corticosteroids its uses and adverse effects,
Treatment of Diabetes mellitus(insulin, Metformin, Glibenclamide)

Practicals Syllabus : -20 hrs

Dosage forms Solid
Dosage forms
Liquid Dosage forms
Gaseous Dosage forms
Oral route
Parentral routes
Novel routes
Fixed dose combination - Amoxycillin + clavulinic acid - cotrimoxazole, Lignocaine + Adrenaline
Drug stations - Adrenaline, dopamine, Dobutamine)
Drug stations - Corticosteroids (hydrocortisone, prednisalone, inhaltional steroids)
Drug stations - common antibiotics (amoxycillin, ciprofloxacin, Azithromycin, Metronidazole, Cephalosporins)
Drug stations - Insulin preparations
Instrument & devices (Nasogastric tube, laryngoscope, Different Cathetors, nebulizers, Inhalers, Rotahalers)

Practical examination : 40 marks

1. Dosage Forms : 15 Marks (5 X 3)
   Capsules, Tablets, Syrup, Iv, Im, Sc, Ia, Intra Articular - Advantages (1 Mark), Disadvantages (1 Mark) Examples (1 Mark)
2. Mention the name of the Device / Instruments and uses : 15 marks (5X3)
   Inhalares, Rotahalers, Spacehalers, Dripsets, Vasofix, ryles tube, urinary catheter, Endotracheal tube, Hand gloves
3. 10 Spotters : 10 marks (10X 1) 2 uses of preparation

Recommended Books Recent Editions.

1. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post Box, 7193, G-16, Emca House, 23/23, Bansari Road, Daryaganj, New Delhi.
2. Padmaja Udaykumar -Pharmacology for Allied Sciences.
3. R.S. Satoskar, S.D. Bhandarkar, S.S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th edition, Single Volume, M/s Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay - 400 034.

BRCT 2.4 Health Care

Learning Objectives

1. To define Health and understand various concepts of Health
2. To know the Health care delivery system inIndia
3. To know various National Health Programmes of India
4. To have overview of First Aid Principles and guidelines

Unit I

1a Concepts of Health

Definition of health; evolution in concepts of public health; public health events-sanitary awakening, germ theory of disease, rise of public health in various countries, changing concepts of health- biomedical concept, ecological concept, psycho-socialconcept and holistic concept.

1b. Dimensions of Health

Physical dimension, mental dimension, Social dimension etc; Common health problems in India - Communicable diseases, Non communicable diseases, MCH problems, Nutritional problems, Environmental sanitation, Glance over National Health profile.

Unit II

2a Evolution of health care delivery systems

History of health care delivery services; Genesis of primary health care; National health policy;MDGs.

2b Levelsofhealth care

Primary health care, secondary health care, tertiary health care.

Primary health care-principles of primary health care, elements of primary health care.

Unit III

3a Primary health care: Delivery of services

Introduction; Structure of health care delivery system; Delivery of primary health care services at village level; Village health guide, ASHA, ICDS: Subcentre: Primary health centre.

3b Secondary and tertiary health care: Delivery of services

Community Health centre; First referral unit; District hospital.

Unit IV

4a Primary health care - Current status in India

Status of health care infrastructure; Health team concept; Health insurance; Social securityand socialassistance in health; AYUSH.

4b National HealthProgrammes

Introduction; National Vector Borne Disease Control Programme; National Leprosy Eradication Programme; Revised National Tuberculosis Control Programme; National AIDS Control Programme; Universal Immunization Programme; National Rural Heath Mission.

Unit V

5a National Health Programmes

Reproductive and Child Health Programme; Integrated Management of Neonatal and Childhood Illnesses; National Nutritional Anemia Prophylaxis Programme; National Programme for Control of Blindness; National Cancer Control Programme; National Mental Health Programme.

5b First aid

Basic terminologies; general guidelines; first aid in specific situations; Wound, bleeding, fracture, choking, burns, epistaxis, strains and sprain, animal bites (classification, causes and first aid), Cardio-pulmonary resuscitation

Recommended Books Recent Editions.

1. Park K. Park's Textbook of Preventive and Social Medicine. 23rd ed. Jabalpur: Banarsidas Bhanot Publishers, 2015. p.135-141
2. Suryakantha. Textbook of Community Medicine with recent advances. 4th edition
3. Bhalwar R editor. Textbook of Public Health and Community Medicine. 2nd Pune, Department of Community medicine AFMC; 2012

BRCT 2.5 Psychology

Objective

After studying this applied paper, at the end of the semester students shall be able to demonstrate and develop the skills to understand patients better in the respective field.

Unit -I

Introduction to Psychology; Meaning and Definitions psychology. Evolution of modern psychology. Scope of Psychology. Branches of psychology. Concept of normality and abnormality.

Unit -II

Identifying psychological disorders. Anxiety disorders (panic, phobia, OCD, PTSD signs symptoms and management).

Unit -III

Stress, Hans Selye Model of stress. Lazarus and Folkman model of stress. Sources of stress. Stress, disease and health. Changing health- impairing behavior.

Unit-IV

Learning; Meaning, definition, Theories of learning .Pavlov's classical conditioning .Skinner's operant conditioning.

Unit-V

Therapeutic Techniques. Counselling-meaning and definition.
Psychotherapy- meaning and definition. Relaxation-types. (Brief introduction to psychoanalytical, behavioral and cbt techniques)

Recommended Books Recent Editions.

1. C.P. Khokhar (2003) Text book of Stress Coping and Management Shalab Publishing House.
2. S.M.Kosslyn and R.S.Rosenberg (2006) Psychology in Context. Pearson Education Inc.
3. C.R. Carson, J.N. Bitcher, S.Mineka and J.M. Hooley (2007), Abnormal Psychology13th, Pearson Education, Inc.
4. D.A. Barlow and V.M. Durand (2004) Abnormal Psychology Wadsworth, Thompson Learning, 3rd edition USA.
5. R.J . Gerrig & P.G. Zimbardo (2006) Psychology and life, Pearson Education, Inc.
6. Pestonjee, D.M. (1999). Stress & Coping, The Indian Experience 2nd edn. New Delhi, Sage India Publications.

SEMESTER- III

BRCT 3.1 T/P Applied Pathology

UNIT I

* Atherosclerosis-definition, risk factors, pathogenesis, morphology and complications
* Ischemic heart disease: Myocardial infarction- definition, pathogenesis, morphologyand complications
* Hypertension- Benign and malignant hypertension: pathogenesis, pathology and complications

UNIT II

* Heart failure-Right and left heart failure: causes, pathophysiology and morphology
* Rheumatic heart disease and infectious endocarditis- definition, etiopathogenesis, morphologyand complications
* Congenital heart disease- Types and atrial septal defect; aneurysms- types and morphology; cardiomyopathies in brief

UNIT III

* Atelectasis - types, Adult respiratory distress syndrome - causes , pathogenesis and morphology; pulmonaryedema- classification, causes and morphology
* Chronic obstructive pulmonarydisease- Chronic bronchitis, emphysema, asthma, bronchiectasis: Definition, etiopathogenesis and morphology
* Restrictive pulmonary diseases- Definition, categories, pathogenesis and morphology

UNIT IV

* Pneumoconiosis-types, asbestosis, coal workers pneumoconiosis - etiopathogenesis andmorphology
* Pulmonary embolism, infarction, pulmonary hypertension-Definition, etiopathogenesis andmorphology
* Pneumonia-Classification of pneumonias; Lobar pneumonia and bronchopneumonia - etiology, pathologyand complications

UNIT V

* Clinical manifestations ofrenal diseases
* Glomerular lesions in systemic diseases- diabetes, amyloidosis and systemic lupus erythematosus
* Pericardialand pleuraleffusions- causes and microscopy

Practicals:

1. Urine examination: physical, chemical, microscopy
2. Blood grouping & Rh typing
3. Hemoglobin estimation, packed cell volume (PCV), erythrocyte sedimentation rate (ESR)
4. Charts
5. Specimens

   * Atherosclerosis
   * Pneumonia
   * Tuberculosis
   * Infarct - lung
   * Contracted kidney
   * Hydronephrosis

Final examination (practicals)

1. Hemoglobin - 10 marks
2. Blood group - 10 marks
3. Charts + Specimens - 10 marks (5 marks each)
4. Urinalysis - 10 marks

Reference Books (latest edition)

1 Basic Pathology Robbins Saunders an imprint of Elsevier Inc., Philadelphia, USA
2 Text book of Pathology Harsh Mohan Jaypee Brothers, New Delhi
3 Practical Pathology P. Chakraborty, Gargi Chakraborty New Central Book Agency, Kolkata
4 Text Book of Haematology Dr. Tejinder Singh Arya Publications, Sirmour (H.P)
5 Text Book of Medical Laboratory TechnologyPraful Godkar, BhalaniPublication House, Mumbai
6 Text Book of Medical Laboratory TechnologyRamanikSood
7 Practical Haematology Sir John Dacie Churchill Livingstone, London.
8 Todd & Sanford, Clinical Diagnosis & Management by LaboratoryMethods John Bernard Henry All India Travellar Booksellar
9 Histopathology Techniques. Culling
10 Histopathology Techniques Bancroft
11 Diagnostic Cytopathology Koss
12 Diagnostic Cytopathology Winifred grey
13 Hand-Book of Medical Laboratory Technology CMC Vellore
14 Basic Haematological Techniques Manipal Manual

BRCT 3.2 T/P Applied Microbiology

Unit I.

Sterilization and disinfection **12 hrs**

- Sterilization and disinfection - classification, principle, methods
- Central sterile supply department

Unit II

Importance of sterilization and disinfection **12 hrs**

- Disinfection of instruments used in patient care
- Disinfection of patient care unit
- Infection control measures for ICUs

Unit III

Health care associated infections **12 hrs**

- Surgical site infections
- Urinary tract infections
- Ventilator associated pneumonia
- Catheter associated blood stream infections
- Antibiotic associated diarrhea

Unit IV

Drug resistant bacteria **12 hrs**

MRSAVRE

Drug resistant Gram negative bacteria

Unit V

Occupationally acquired infections and its prevention **12hrs**

a. Respiratory route - Tuberculosis, Varicella zoster virus, Influenza, RSV
b. Blood borne route - HIV, HBV, HCV, CMV, Ebola
c. Orofecal route - Salmonella, Hepatitis A
d. Direct contact - Herpes virus

Practicals **20 hrs**

1. Sterilization and disinfection practices in tertiary care hospital
2. Quality control of sterilization and Interpretation of results of sterilitytesting
3. Collection of specimen from outpatient units, inpatient units, minor operation theatre and major operation theatre for sterility testing.
4. Preparation of materials for autoclaving - packing of materials, loading, holding time and unloading
5. Disinfection of wards, operation theatres and laboratory and air sampling methods

Practical Examination Pattern

1. Sterilization and disinfection practices in tertiary care hospital andquality control of sterilization and Interpretation of results of sterilitytesting.
20 Marks
2. Preparation of materials for autoclaving - packing of materials, loading, holding time and unloading.
10Marks
3. Disinfection of wards, operation theatres, dialysis units and laboratory and air sampling methods. Collection of specimen from outpatient units, inpatient units, minor operation theatre and major operation theatre for sterility testing. 10Marks

Recommended Books:

1. Textbook of Microbiology by Ananthnarayan and paniker
2. Textbook of hospital infection control by Purvamathur
3. Textbook of Microbiology by Baveja
4. Hospital infection control by Mayhall

BRCT 3.3 T/P Introduction to Respiratory Care Technology

Objectives:
To understand and get introduced to Respiratory Care, Applied Anatomy and Physiology, gas physics and basic clinical examination

Unit I

Applied Anatomy and Physiology - 10 hours

1. Applied Anatomy

a) Lungs, lobes, pleura & fissures, respiratory muscles, upper respiratory tract, lower respiratory tract, lung parenchyma, interstitium, alveoli, pulmonary vasculature, mediastinum, chest wall, inter costal space.
b) Heart, chambers, valves, major vessels, pericardium, systemic and pulmonary circulation,
c) Chest topography - identification of imaginary lines, topographical landmarks over thorax, topography of heart and lungs.
d) Surface marking of lungs, pleura, fissures, precordium, heart valves, major vessels

2. Applied Physiology

a) Functional zones of respiratory system.
b) Concepts of ventilation, air flow, diffusion, alveolar-capillary membrane, gas exchange, transport of oxygen and carbon dioxide.
c) Mechanics of breathing, Pulmonary pressures, lung volumes and capacities, resistance, compliance.
d) Blood circulation, cardiac output, pulmonary circulation, pulmonary oedema
e) Ventilation perfusion ratio, VQ mismatch.
f) Control of breathing
g) Hypoxia & Hypercapnea, respiratory failure

Unit II -

History taking and general physical examination - 10 hours

3. Communication and History taking

a) Communication with Patient
b) Medical history taking
c) Symptomatology, history of presenting illness, past history, occupational and personal history, treatment history.

4. Clinical Examination - General Physical Examination

a) Assessment of vital signs: General appearance, Sensorium, Pulsation, Blood pressure, Respiration, body temperature, fluid balance/hydration
b) Identifying abnormal signs in general physical examination

Unit III

Systemic Examination - 14 hours

5. Clinical Examination - Basic Assessment of respiratory system.

a) Inspection, palpation, percussion and auscultation of respiratory system.
b) Definition and significance of the presence of altered resonance, abnormal breath sounds and adventitious sounds.

6. Basic Clinical Assessment of other organ systems.

a) Cardiovascular system:
   i. Symptoms of cardiovascular disease
   ii. Examination of the precordium and basic cardiovascular functions
b) Skin and extremities
c) Neurological system.
d) Abdomen.

Unit IV

Gas Physics and Medical Gas Supply - 12 hours

7. Gas physics.

a) State of matter, density, specific gravity, humidity
b) Units of measurement, Metric, SI, NTPS, BTPS & conversion
c) Temperature, Pressure, Volume, Flow
d) Gas flows and diffusion.
e) Gas laws and its application in respiratory care.

8. Medical gas supply.

a) Compressed gas cylinders.
b) Colour coding and Cylinder storage.
c) Cylinders and cylinder valves.
d) Diameter index safety system.
e) Medical gas pipeline system and station outlets.
f) Air compressors and components.
g) Oxygen concentrators.
h) Alarms and safety devices.

Unit V

Gas Administration Devices - 14 hours

9. Gas administration devices (reducing valves, flow meters and regulators).

a) Simple oxygen administration devices.
b) Methods of controlling gas flow.
c) Reducing valve, Flow meters, restrictors and regulators
d) Selection of device
e) Precautions, advantages and disadvantages

Practical:

1. History taking
2. Clinical Examination: General Physical Examination and assessment of vital signs
3. Clinical Examination: Basic Systemic Examination
4. Conversion between different units
5. Identifying the types of medical gas supply and its advantages/disadvantages
6. Devices: sphygmomanometer, thermometer, pulse oximeter , simple oxygen delivery devices,

Practical Exam Pattern:

* Spotters
* Drugs, Instruments and devices
* X rays, Spirometry, DLCO, ABG and Basic Blood investigation reports
* Case Discussion
* Demonstration of Procedures

Recommended Books

1. Egan's Fundaments of Respiratory Care
2. Hutchison's Clinical Methods
3. Mosby's Respiratory care equipment
5. Respiratory Physiology, The Essentials - John B West
6. Pulmonary Pathophysiology The Essentials - John B West

Online Resources:

American Association of Respiratory Care (AARC)

BRCT 3.4 Computer Application

1 Overview

- Functionalities of a computer
- Definition
- Advantages
- Disadvantages

2 Applications

- Banking
- Insurance
- Education
- Marketing
- Health Care
- Engineering Design
- Military
- Communication
- Government

3 Generations

- First Generation
- Second Generation
- Third Generation
- Fourth Generation
- Fifth Generation

4 Types of Computer

- PC (Personal Computer)
- Workstation
- Minicomputer
- Mainframe
- Supercomputer

5 Components

- Input Unit
- CPU (Central Processing Unit)
- Output Unit

6 CPU - Central Processing Unit

- Memory or Storage Unit
- Control Unit
- ALU (Arithmetic Logic Unit)
- Arithmetic Section
- Logic Section

7 Input Devices

- Keyboard
- Mouse
- Advantages
- Joystick
- Light Pen
- Track Ball
- Scanner
- Digitizer
- Microphone
- Magnetic Ink Card Reader(MICR)
- Optical Character Reader(OCR)
- Bar Code Readers
- Optical Mark Reader(OMR)

8 Output Devices

- Monitors
- Cathode-Ray Tube (CRT) Monitor
- Flat-Panel Display Monitor
- Printers
- Impact Printers
- Character Printers
- Dot Matrix Printer
- Daisy Wheel
- Line Printers
- Drum Printer
- Chain Printer
- Non-impact Printers
- Laser Printers
- Inkjet Printers

9 Memory

- Cache Memory
- Primary Memory (Main Memory)
- Secondary Memory

10 Random Access Memory

- Static RAM (SRAM)
- Dynamic RAM (DRAM)

11 Read Only Memory

- MROM (Masked ROM
- PROM (Programmable Read only Memory)
- EPROM(Erasable and Programmable Read Only Memory)
- EEPROM (Electrically Erasable and Programmable Read Only Memory)
- Advantages of ROM

12 Mother board

- Features of Mother board
- Popular Manufacturers
- Description of Mother board

13Memory Units

14Ports

- Serial Port
- Parallel Port
- PS/2 Port
- VGA Port
- Power Connector
- Firewire Port
- Modem Port
- Ethernet Port
- Game Port
- Digital Video Interface, DVI port
- Sockets

15Hardware

- Relationship between Hardware and Software

16Software

- System Software
- Application Software

17Number System

- Decimal Number System
- Binary Number System
- Octal Number
- Hexadecimal Number System

18Data and Information

- Data Processing Cycle

19Networking

- Characteristics of Computer Network
- Cables
- Router
- Network Card
- Internal Network Cards
- External Network Cards

20Operating System

- Objectives of Operating System
- Characteristics of Operating System

21Internet and Intranet

- Similarities in Internet and Intranet
- Differences in Internet and Intranet

22Computer Viruses

- Types of computer virus
- Use of Antivirus software

Practicals:

Suggested Hands on Exercises Operating System:

1. Starting the Windows Starting a program, running a program Running multiple programs and switching between windows Customizing the Task bar Recycle bin, restoring the deleted files
2. Creating and removing folders Making the taskbar wider, arranging icons on the Desktop Displaying and hiding the taskbar clock Controlling the size of start menu options CreatingShortcuts.
3. Customizing desktop view Adding a program to the start menu Adding a program shortcut inthe Desktop Customizing the mouse settings
4. Expanding and collapsing a folder Recognizing File types using icons Running a program fromexplorer Renaming a file or folder Sorting a folder
5. Displaying the properties for a file or folder Using cut and paste operations to move a file Using copy and paste operations to copy a file Moving and copying files with mouse Searching a file or folder byusing search command
6. Finding a file or folder, by name Defragmenting the disk, using disk defragmenter Controlling the speaker volume Recording and saving an audio file Connecting a printer to the PC

Word Processing:

1. Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settingsetc.
2. Preparing a news letter: To prepare a newsletter with borders, two columns text, header and footer and inserting a graphic image and page layout.
3. Creating and using styles and templates To create a style and apply that style in a document To create a template for the styles created and assemble the styles for the template.
4. Creating and editing the table to create a table using table menu To create a monthly calendar using cell editing operations like inserting, joining, deleting, splitting and merging cells To create a simple statement for math calculations viz. Totaling the column.
5. Creating numbered lists and bulleted lists To create numbered list with different formats (with numbers, alphabets, roman letters) To create a bulleted list with differentbullet characters.
6. Printing envelopes and mail merge. To print envelopes with fromaddresses and to addresses To use mail merge facility for sending a circular letter to many persons To use mail merge facility for printing mailing labels.

7. Using the special features of word To find and replace the text To spell check and correct. To generate table of contents for a document To prepare index for a document.

8 Create an advertisement Prepare a resume. Prepare a Corporate Circular letter inviting the shareholders to attend the Annual Meeting.

Work Sheet:

1. Using formulas and functions: To prepare a Worksheet showing the monthly sales of a company in different branch offices (Showing Total Sales, Average Sales). Prepare a Statement for preparing Result of 10 students in 5 Course (using formula to get Distinction, I Class, II Class and Failunder Result column against eachstudent).
2. Operating on the sheets: Finding, deleting and adding records, formatting columns, row height, merging, splitting columns etc. Connecting the Worksheets and enter the data.
3. Creating Different type of Charts: To create a chart for comparing the monthly sales ofa company in different branchoffices.
4. Using the data consolidate command: To use the data consolidate command to calculate the total amount budgeted for all departments (wages, travel and entertainment, office supplies and so on) or to calculate the average amount budgeted for - say, department office expenses.
5. Sorting Data, Filtering Data and creation of Pivot tables.

Presentation:

1. Creating a new Presentation based on a template - using Auto content wizard, design template and Plain blank presentation.
2. Creating a Presentation with Slide Transition - Automatic and Manual with different effects.
3. Creating a Presentation applying Custom Animation effects - Applying multiple effectsto the same object and changing to adifferent effect and removing effects.
4. Inserting Objects Creating and Printing handouts.
5. Publishing Presentation Exporting Presentations.

Internet:

1. Understanding different types of Browser Programs and Internet file types. (.html, pdfetc.)
2. Searching for a website / application / text documents viewing and downloading.
3. Create an E-mailaccount, Retrieving messages from inbox, replying, attaching files filtering andforwarding
4. Operating on a Tablet / Smart Phone - browsing and practicing on some important applications (UcBrowser, Skype) - operating on internet - creating and sending messages / mails using the applications like WhatsApp and We Chat etc.- downloading text and media files and video conferencing using Skype.

BRCT 3.5 Environment Science and Health

Learning Objectives

1. To know various Environmental factors Health
2. To learn the modes of disease transmission and various control measures

Unit I

1. a. Introduction to Environment and Health and Water

Ecological definition of Health, Population perspective of relations, Health & environment perspective of relations, Environmental factors, Environmental Sanitation, Need to study environmental health, Predominant reasons for ill-health in India

1.b. Water

Safe and wholesome water, requirements, uses, sources; sanitary well; Hand pump; water Pollution; Purification of water; large scale & small scale; slow sand filters; rapid sand filters; Purification of Water on a small scale; Household purification, Disinfection ofwells; water qualitycriteria & standards.

Unit II

Air, Light, Noise, Radiation

2 a. Air

Composition, Indices of Thermal Comfort, Air pollutants, Air Pollution - Health Effects, Environmental Effects, Green-house effect, Social & Economic Effects, Monitoring, Prevention & Control.

2. b. Light, Noise, Radiation

Natural and Artificial light; Properties, sources, noise pollution and its control, types, sources, biological effects and protection.

Unit III

Waste and Excreta Disposal

3 a. Disposalof Wastes

Solid Wastes, Health hazards, Methods ofDisposal; Dumping, Controlled tipping/ sanitary landfill, Incineration, Composting.

3 b. Excreta Disposal

Public health importance, Health hazards, sanitation barrier, Methods of excreta disposal, unsewered areas and sewered areas, sewage, Modern Sewage Treatment.

Unit IV

Housing and Health and Medical Entomology

4 a. Housing and Health

Human Settlement, Social goals of housing, Criteria for Healthful Housing by Expert Committee of the WHO, Housing standards- Environmental Hygiene Committee, Rural Housing Standards, Overcrowding, Indicators of Housing.

4 b. Medical Entomology

Classification of Arthropods, Routes of Disease transmission, Control measures.

Unit V

Insecticides and Rodents

5 a. Insecticides

Types, mechanism of action, dosage and application for control of insects.

5 b. Rodents

Rodents and its importance in disease, along with anti-rodent measures.

Reference Books (latest edition)

1. Park K. Park's Textbook of Preventive and Social Medicine. 23rd ed. Jabalpur: Banarsidas Bhanot Publishers; 2015. p.135-141
2. Suryakantha. Textbook of Community Medicine with recent advances. 4th edition.
3. Bhalwar R. Textbook of Public Health and Community Medicine. 2nd edition. Pune: Department of Community Medicine AFMC, 2012

SEMESTER –IV

BRCT 4.1 T/P Patient Cares and Basic Nursing

Objectives

To learn about patient care and basics of nursing activities, communication and documentation, infection control, medication administration and wound care.

Unit I

Introduction, Communication and Documentation - 12 hours

1. Introduction to Patient Care:

a) Principles of patient care
b) Types of patients (gender, age, diseases, severity of illness, triage)

2. Communication & Documentation:

a) Communication with doctors, colleagues and other staffs.
b) Non-verbal communication, Inter-personnel relationships.
c) patient contact techniques, communication with patients and their relatives

3. Documentation:

a. Importance of documentation,
b. initial and follow up notes;
c. documentation of therapy, procedures and communication

Unit II

Universal Precautions and Infection Control - 10 hours

4. Universal Precautions and Infection Control:

a) Hand washing and hygiene.
b) Injuries and Personal protection, Insulation and safety procedures.
c) Aseptic techniques, sterilization and disinfection.
d) Disinfection and Sterilization of devices and equipment
e) Central sterilization and supply department
f) Biomedical Medical waste management

Unit III

Medication Administration and Transport of patient - 14 hours

5. Medication Administration:

a) Oral / Parenteral route
b) Parenteral medication administration: Intra venous, intra muscular, sub- cutaneous, intra dermal routes, Intra venous Infusion
c) Aerosol medication administration, Oxygen therapy
d) Intravenous fluids
e) Blood and blood component transfusion

6. Position and Transport of patient:

Patient position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions comfort measures, bed making, rest and sleep.

a) Lifting and transporting patients: lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher.

b) Transport of ill patients (inotropes, intubated / ventilated patients)

Unit IV

Bedside care and monitoring - 14 hours

7. Bedside care:

a) Methods of giving nourishment: feeding, tube feeding, drips, transfusion.

b) Recording of pulse, blood pressure, respiration, saturation and temperature.

c) Bed side management: giving and taking bed pan, urine container.

d) Observation of stools, urine, sputum, drains

e) Use and care of catheters and rubber goods.

f) Care of immobile/bed ridden patients, bed sore and aspiration prevention

8. Monitoring of Patient:

a) Pulse, ECG (Cardiac Monitor), Oxygen Saturation, Blood Pressure, Respiration

b) Multi parameter monitors, Capnography and End Tidal CO2 (ETCO2)

c) Hydration, intake and output monitoring

d) Monitoring ventilator parameters: Respiratory Rate, Volumes, Pressures, Compliance, Resistance

Unit V

Wound care and first aid - 10 hours

9. Dressing and wound care:

a) Bandaging: basic turns, bandaging extremities, triangular bandages and their application.

b) Surgical dressing: observation of dressing procedures.

c) Suture materials and suturing techniques

d) Splinting

e) Basic care of patient with burns

10. First Aid and Basic Life Support (BLS)

Practical:

1. Demonstration of Patient care Procedures:

a) Positioning of patient, transport of the patient, Dressing and Bandaging, Care of inter costal drain tube, Insertion of naso-gastric tube and feeding

b) Phlebotomy and obtaining blood samples, Arterial Blood sampling for ABG

c) Injections: intra muscular, intra venous, sub cutaneous, intra dermal

d) Insertion of intra venous catheter and infusion of medications, blood transfusion

e) Recording of ECG and monitoring of patient

f) Oxygen therapy: oxygen cannula, masks. Aerosol therapy: nebulization, inhalers

g) Suctioning and care of artificial airway

h) Insertion of urinary bladder catheter

2. Uses, principles, advantages and disadvantages of instruments and Devices in patient care
3. First aid and Basic Life Support (BLS)

Practical Exam Pattern:

Spotters, Drugs, Instruments and devices - identification and usage, demonstration of patient care procedures.

Reference Books:

1. Principles and practice of Nursing - Sr Nancy
2. Introduction to Critical Care Nursing - Mary Lou Sole
3. First Aid - Redcross society guidelines
4. Basic Life Support (BLS) - American Heart Association guidelines

BRCT 4.2 T/P Respiratory Care Technology - Basic

Objectives:

To learn about basics of Oxygen therapy, aerosol and humidity therapy investigations performed for respiratory diseases and classfication

Unit I

Oxygen, humidity and aerosol therapy - 14 Hours

1. **Oxygen therapy** (rationale for oxygen therapy, precautions, assessment of need and adequacy of therapy and the relevant devices)
    a) Definition, types, devices, goals, Indications and contraindications
    b) Hazards and complications
    c) Use and principles of oxygen delivery devices
    d) Selection of device, precautions and monitoring of patient
2. **Humidity and Aerosol therapy**
    a) Definition, types, devices, goals, Indications and contraindications
    b) Hazards and complications
    c) Use and principles of humidifiers and aerosol therapy devices
    d) Small volume nebulization therapy: physiological rationale.
    e) Selection of device, precautions and monitoring of patient.
3. **Chest Physical Therapy:** Introduction and Types of chest physical therapy.

Unit II

Chest X ray and pulmonary function testing - 14 Hours

4. **Chest X-rays:** Introduction, value and limitation of chest X-ray, radiological views.
5. **Pulmonary function testing -** Types, principles, indications, contraindications, procedure, complications.
    a) Spirometry: patterns, significance, bronchodilator response
    b) broncho-provocative tests
    c) DLCO
    d) Lung volumes estimation - body plethysmography
6. **ECG:** basic principles, normal ECG, interpretation in disease.

Unit III

Respiratory Failure and Blood Gas Analysis - 10 Hours

7. **Respiratory Failure**
    a) Definition, types/classification, mechanism
    b) Causes, clinical features, complications
    c) Effects of hypoxia and hypercapnia on other systems
    d) Assessment and management
8. **Arterial Blood Gas Analysis**
    a) Indications, contraindications,
    b) sampling of arterial blood
    c) Complications, transport
    d) Interpretation

Unit IV

Basics of Respiratory Disorders - Part 1 - 12 hours

9. Respiratory Diseases

a) Classification / types
b) Airway diseases
c) Parenchymal / interstitial diseases
d) Respiratory infections
e) Brief mention of the common respiratory diseases

10. Airway Diseases

a) Asthma
b) Chronic obstructive pulmonary diseases, chronic bronchitis, emphysema

11. Respiratory infections

a) Upper respiratory infections
b) Pneumonia, community acquired, hospital acquired, ventilator associated, health care associated
c) Atypical, viral, fungal pneumonia
d) Pulmonary tuberculosis

Unit V

Basics of Respiratory Disorders - Part 2 - 10 hours

12. Suppurative lung diseases

a) Lung abscess
b) Bronchiectasis
c) Empyema thoracis

13. Pleural diseases

a) Pleural effusion
b) Pneumothorax
c) Hemothorax

14. Diseases of mediastinum and chest wall

15.Lung cancer

16.Sleep related Breathing disorders

Practical:

1. History taking and Clinical examination
2. Assessing the need for oxygen therapy, aerosol therapy and humidity therapy.
3. Uses, principles, advantages and disadvantages of instruments and Devices in Basic Respiratory care
4. Procedure demonstration, principles, indications, contraindications and preparation of patient for basic Respiratory Care procedures.
5. Preparing patient for procedures and assisting in procedures like thoracocentesis and ICD insertion
6. Basic Interpretation of Pulmonary Function Tests, Arterial Blood Gases, ECG and Chest X-rays.

Practical Exam Pattern:

Spotters
Drugs, Instruments and devices
X rays, Spirometry, DLCO, ABG and Basic Blood investigation reports Case Discussion
Demonstration of Procedures

Recommended Books

1. Egan's Fundaments of Respiratory Care
2. Hutchison's Clinical Methods
3. Mosby's Respiratory care equipment
4. Respiratory Physiology : The Essentials - John B West
5. Pulmonary Pathophysiology The Essentials - John B West

Online Resources:

American Association of Respiratory Care (AARC)

SEMESTER -IV

BRCT 4.3 T/P Basics of Medical Disorders

Objective:

To learn about basic concepts of common medical disorders and its therapeutic options.

Unit I

Cardiac and Respiratory diseases - 12 hours

1. Cardio vascular diseases
    a. Hypertension, Ischemic heart diseases, Myocardial Infarction, arrhythmias
    b. Heart failure, shock - types, causes
2. Respiratory diseases
    a. Pneumonia, tuberculosis,
    b. Chronic obstructive pulmonary disease, asthma
    c. Pleural effusion, pneumothorax
    d. Interstitial lung disease

Unit II

Neurological, Renal, GI and infectious diseases - 12 hours

3. Neurological diseases
    a. Polio myelitis, Gullian Barre Syndrome, Myasthenia Gravis, epilepsy / seizure disorder, cerebro vascular accident / stroke
4. Renal Diseases
    a. Acute kidney injury
    b. Chronic Kidney Disease
5. Gastro intestinal and Liver Diseases
    a. Gastritis / APD, peptic ulcer
    b. Acute gastroenteritis
    c. Hepatitis, Hepatic failure, alcoholic liver disease
6. Infectious diseases: Dengue, malaria, leptospirosis

Unit III

Blood, fluid, electrolyte and acid base abnormalities - 12 hours

7. Blood loss and Anemia, thrombocytopenia
8. Fluid Electrolyte imbalance and corrective methods
9. Acid Base abnormalities and corrective methods

Unit IV

Pulmonary Oedema, Sepsis and MODS - 10 hours

10. Pulmonary Oedema, Acute Lung Injury and Acute RespiratoryDistress Syndrome
11. Sepsis, multi-organ failure, Multi-organ dysfunction syndrome

Unit V

Health problems in Specific conditions and Toxicology - 14 hours

12. Health problems in specific conditions
    a. Pregnancy - antenatal care, disorders in pregnancy
    b. Children and new born
    c. Obesity
    d. Diabetes mellitus
    e. HIV infections and AIDS
    f. Elderly Course and disability
    g. Brief mention about endocrine disorders
13. Poisoning and drug over dosing
    a. Classification of poisons
    b. Principles of treatment of poisoning and Primary care
    c. Poisons and drug over dosing requiring ventilation
14. Miscellaneous
    a. Drowning
    b. Hanging

Practical:

1. History Taking and clinical examination, monitoring of patient.
2. Therapeutic options for various diseases and conditions

Practical Examination:	**40 marks**
Spotters	20 marks
Drugs, Instruments and devices	
X rays, Basic Blood investigation reports	
* Case Discussion	10 marks
* Demonstration of Procedures	10 marks

Reference Books:

Davidson's Principles and Practice of Medicine - Elsevier Publications
Harrison's Principle of Internal Medicine

BRCT 4.4 Biostatistics and Research Methodology

Learning Objectives

1. To have a basic knowledge of biostatistics and its applications in medicine
2. To know various types of data presentation and data summarization in Medical field
3. To have overview of data analysis and sampling techniques
4. To understand various study designs in Medical field
5. To know applications of various study designs in Medical Research

Biostatistics

Unit I

Introduction and Presentation of data

Meaning, Branches of Statistics, Uses of statistics in medicine, Basic concepts, Scales of measurement, Collection of data, Presentation of data; Tabulation, Frequency Distribution, Diagrammatic and Graphical Representation of Data.

Unit II

Measures of central tendency and Measures of Variation

Arithmetic Mean (Mean), Median, Mode, Partition values, Range, Interquartile range , Mean Deviation, Standard Deviation, Coefficient of Variation.

Unit III

Probability and standard distributions

Definition of some terms commonly encountered in probability, Probability distributions; Binomial distribution, Poisson distribution, Normal distribution, Divergence from normality; Skewness and kurtosis

U**nit IV**

Census and Sampling Methods

Census and sample survey, Common terms used in sampling theory, Non-probability (Non random) Sampling Methods; Convenience sampling, Consecutive Sampling, Quota sampling, Snowball sampling, Judgmental sampling or Purposive sampling, Volunteer sampling, Probability (Random) Sampling methods; Simple random sampling, Systematic Sampling, Stratified Sampling, Cluster sampling, Multi-stage sampling, Sampling error, Non-sampling error.

Unit V

Inferential statistics

Parameter and statistic, Estimation of parameters; Point estimation, Interval Estimation, Testing of hypothesis; Null and alternative hypotheses, Type-I and Type-II Errors.

Research Methodology

Unit I

Introduction to research methodology

Types of research; Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical.

Unit II

Study Designs-Observational Studies

Epidemiological study designs; Observational studies, Descriptive studies; Case reports, Case series, Analytical studies; Case control studies, Cohort studies, Cross sectional

Unit III

Experimental Studies

Experimental studies (Interventional studies); Randomized control trials (Clinical trials), Field trials, Community trials, Nm - Randomized trials.

Unit IV

Uses of Epidemiology

Unit V

Application of study Designs in Medical Research

References

1. K.R.Sundaram, S.N.Dwivedi and V Sreenivas (2010), Medicalstatistics, principles and methods, BI Publications Pvt Ltd, New Delhi
2. NSN Rao and NS Murthy (2008), Applied Statistics in Health Sciences, Second Edition, Jaypee Brothers Medical Publishers (P) Ltd.
3. J.V.Dixit and L.B.Suryavanshi (1996), Principles and practice of biostatistics, First Edition, M/S Banarsidas Bhanot Publishers.
4. GetuDegu and Fasil Tessema (2005), Biostatistics, Ethiopia Public Health Training Initiative.
5. Park K. Park's Textbook of Preventive and Social Medicine. 23rd ed. Jabalpur: Banarsidas Bhanot Publishers, 2015. p.135-141.
6. Suryakantha. Textbook of Community Medicine with recent advances. 4th edition.
7. Bhalwar R. Textbook of Public Health and Community Medicine. 2nd Edition. Pune, Department of Community Medicine AFMC, 2012.
8. Leon Gordis. Epidemiology Fourth Edition - Elsevier Saunders Publication.

BRCT 4.5 Constitution of India

Unit - I:

Meaning of the term 'Constitution'. Making of the Indian Constitution 1946-1950.

Unit - II:

Thedemocratic institutions created bythe constitution, Bicameral systemof Legislature at the Centre and in the States.

Unit - III:

Fundamental rights and duties their content and significance.

Unit - IV:

Directiveprinciples ofStates, policies the need to balance fundamentalrights with directiveprinciples.

Unit - V:

Specialrights created inthe Constitution for dalits, backwards, women and children and the religious and linguistic minorities.

Unit - VI:

Doctrine ofSeparation ofPowers, legislative, executive and judicial and their functioning inIndia.

Unit - VII:

The Election Commission and State Public Service commissions.

Unit - VIII:

Method of amending the Constitution.

Unit - IX:

Enforcing rights through writs.

Unit - X:

Constitution and sustainable development in India.

Recommended Books:

1. J.C. Johari. The Constitution of India. A Politico-Legal Study. Sterling Publication, Pvt. Ltd. New Delhi.
2. J.N . Pandey. Constitution Law of India, Allahbad, Central Law Agency, 1998.
3. Granville Austin. The Indian Constitution. Corner Stone of a Nation-Oxford, New Delhi, 2000.

SEMESTER -V

BRCT 5.1 T/P Basic Respiratory Therapeutics & Monitoring

Objective:

To learn about basic therapeutics & monitoring of patients in respiratory care

Unit I

Patient Assessment and Device Selection - 12 hours

1. Assessing the patient for need of respiratory care
2. Selection of device, precautions and monitoring of patient during respiratory care.(like oxygen therapy, humidity therapy, aerosol therapy, chest physical therapy)

Unit II

Drugs and Nutrition in Respiratory Care - 12 hours

3. Drugs acting on respiratory system and emergency drugs
    a. Drugs acting on airway
    b. antibiotics in lung infections and anti TB Drugs
    c. Emergency Drugs
4. Nutrition assessment and supplementation

Unit III

Patient monitoring in respiratory care- 12 hours

5. Monitoring of a patient with respiratory disease
    a) Gas analysis and analyzers.
    b) Trans-cutaneous oxygen monitors and Pulse oximeters.
    c) Capnography.
    d) Monitoring response to therapy and progression of disease
    e) Multi parameter monitoring

Unit IV

Artificial Airway and Emergency airway management - 12 hours

6. Artificial airways (oral and nasal endotracheal tubes, tracheostomy tubes)
    a) Types, parts, features and sizes and selection of airway.
    b) Indications and complications.
7. Airway management:
    a) Procedures: Intubation, Extubation and Care of Artificial Airway
    b) Tracheostomy and de-cannulation
    c) Oxygen therapy, Humidity therapy, Aerosol therapy and Chest physical therapy in patients with artificial airway
8. Emergency airway management and Basic Life Support (BLS)

Unit V

Manual resuscitators and ventilation - 12 hours

9. Manual resuscitators and ventilators
    a) Face Masks, AMBU, Bains
    b) Advantages and disadvantages of the manual resuscitators
    c) Selection and Use of manual resuscitators
10. Basics of Mechanical ventilation
    a) Positive and negative pressure ventilation
    b) Types of ventilators

Practical:

1. Selection of device and methods of respiratory care after assessing the need for oxygen therapy, aerosol therapy, humidity therapy, airway clearance therapy,lung expansion therapy and breathing exercises.
2. Uses, principles, advantages and disadvantages of instruments and Devices in Basic Respiratory therapeutics
3. Procedure demonstration, principles, indications, contraindications and preparation of patient for basic Respiratory therapeutic procedures like CPR, airway insertion, Intubation, IV Access, Thoracocentesis, Chest TubeInsertion, Tracheostomy.

Practical Exam Pattern:

Spotters Drugs, Instruments and devices

X rays, Spirometry, DLCO, ABG and Basic Blood investigation reports

Case Discussion

Demonstration of Procedures

Recommended Books

1. Egan's Fundaments of Respiratory Care
2. Hutchison's Clinical Methods
3. Mosby's Respiratory care equipment
4. Respiratory Physiology. The Essentials - John B West
5. Pulmonary Pathophysiology The Essentials - John B West

Online Resources:

American Association of Respiratory Care (AARC)

BRCT 5.2 T/P Chest Physical Therapy and Pulmonary Rehabilitation

Objective:

To learn about use of physical quantities / forces for the therapy in respiratory care

Unit I

Introduction

1. Introduction to Physical Therapy
    a) Mention about the physical quantities and basic principles used in physical therapy
2. Introduction to Chest Physical Therapy
    a) Assessment of need for chest physical therapy
    b) Use and principles of Chest Physical Therapy methods and devices
    c) Selection of method, device, precautions and monitoring ofpatient.
    d) Preparation of care plan

Unit II

Airway Clearance Therapy

3. Airway Clearance Therapy
    a) Indications, contraindications, procedure, complications
    b) Selectionmethod, device, precautions and monitoring of patient.

Unit III

Lung Expansion Therapy

4. Lung Expansion Therapy
    a) Indications, contraindications, procedure, complications
    b) Selection method, device, precautions and monitoring of patient.

Unit IV

Respiratory Muscle Strengthening

5. Respiratory muscle strengthening and breathing exercises
    a) Indications, contraindications, procedure, complications
    b) Selection method, device, precautions and monitoring of patient.

Unit V

Pulmonary Rehabilitation and Home care Plan

6. Pulmonary Rehabilitation
    a) Goals, scientific basis and principles
    b) Components and methods in pulmonary rehabilitation
    c) Assessment of the patient and selection
    d) Cardio pulmonary exercise testing
    e) Planning Rehabilitation program
    f) Monitoring during rehabilitation and complications
    g) Cardiac rehabilitation
7. Home care plan for pulmonary rehabilitation

Practical:

1. Selection of device and methods of therapy after assessing the need for airway clearance therapy, lung expansion therapy and breathing exercises.
2. Demonstration of chest physical therapy, exercise testing and rehabilitation methods
3. Assessment of patient and Preparation of care plan for pulmonary rehabilitation.
4. Recognition of contraindications for the chest physical therapy procedures

Practical Exam Pattern:

Spotters
Instruments and devices
Case Scenarios
Demonstration of Procedures

Recommended Books:

1. Chest Physical Therapy and Pulmonary Rehabilitation, An Interdisciplinary
2. Approach - Donna L. Frownfelter
3. Handbook of Practical Chest Physiotherapy – Mitra

Online Resources:

American Association of Respiratory Care (AARC)
Chest Physical Therapy - Cystic Fibrosis Foundation

BRCT 5.3 T/P Respiratory Care Technology - Clinical

Objective:

To learn the basics of Clinical evaluation, management and respiratory care of common respiratory diseases:

Unit I

Upper respiratory disorders - 12 hours

1. Upper Respiratory Tract
    a) Acute rhinitis, sinusitis, pharyngitis, Larynogotrachiitis and Epiglotitis.
2. Sleep Apnoea Syndrome

Unit II

Pulmonary infections - 12 hours

3. Pulmonary Infections
    a) Common viral and fungal lower respiratory infections.
    b) Pulmonary tuberculosis. Pneumonia: community acquired, hospital acquired, in immune compromised host. Atypical pneumonia.
    c) Lung abscess.

Unit III

Airway and interstitial lung disease - 12 hours

4. Diseases of Airway
    a) Bronchitis, Asthma, Chronic obstructive pulmonary disease.
    b) Bronchiectasis.
5. Interstitial Lung Disease
6. Pleural diseases: Pleural effusion, Pneumothorax, Hemothorax, Empyema Thoracis

Unit IV

Chest wall and pulmonary vascular disease - 12 hours

7. Neuromuscular diseases and chest wall abnormalities
    a) Kyphosis, scoliosis,
    b) Neuromuscular diseases affecting respiratory muscles
8. Pulmonary Vascular Diseases
    c) Pulmonary hypertension
    d) Pulmonary thrombo embolism
    e) Pulmonary hemorrhage

Unit V

ARDS, lung cancer and respiratory disorders in children - 12 hours

9. Pulmonary Oedema, Acute lung injury and ARDS
10. Lung Cancer
11. Respiratory diseases in children and new born.

Practical:

1. History taking and Clinical examination
2. Selection of appropriate respiratory care method for a given patient
3. Procedure demonstration, principles, indications, contraindications and preparation of patient for basic Respiratory Care procedures.
4. Interpretation of Pulmonary Function Tests, Arterial Blood Gases, ECG and Chest X-rays.

Practical Exam Pattern:

Spotters
Drugs, Instruments and devices
X rays, Spirometry, DLCO, ABG and Basic Blood investigation reports
Case Discussion
Demonstration of Procedures

Recommended Books

1. Egan's Fundaments of Respiratory Care
2. Hutchison's Clinical Methods
3. Mosby's Respiratory care equipment
4. Respiratory Physiology, The Essentials - John B West
5. Pulmonary Pathophysiology The Essentials - John B West
6. Crofton and Douglas - Respiratory Diseases

Online Resources:

American Association of Respiratory Care (AARC)

BRCT 5.4 Pulmonary Function Testing

Objective:

To sensitize about performing lung function testing - spirometry, DLCO in detail and basics of body plethysmography.

Introduction to Pulmonary Function Testing: **4 hours**

Types, Classification
Lung Volumes and Capacities
Pulmonary Interstitium, Blood gas barrier,
Exchange of gases across alveolar capillary membrane
Ventilation perfusion mismatch

Spirometry: **12 hours**

Basics of Spirometry
Various Tests and Manoeuvres in Spirometry
Spirometer equipment, operation and maintenance
Performing spirometry tests
Basic Interpretation
Peak expiratory flow rate

Diffusion Studies (DLCO): **10 hours**

Basics of Diffusion Studies
Diffusing Capacity of Lungs for Carbon Monoxide (DLCO): Principle, procedure
DLCO Equipment, operation and maintenance
Performing DLCO
Basic Interpretation

Body Plethysmography: **4 hours**

Basics of Body Plethysmography
Lung volume testing
Body Plethysmography equipment and basic operation

BRCT 5.5 Allied-5--Medical Ethics

General considerations of Medical Ethics

1. Medical Ethics - Introduction
2. Three cor contents in Medical Ethics - Best interest, autonomy unrights
3. Doctors, patient & Profession

Special considerations of Medical Ethics

1. Consent
2. Confidentiality
3. Genetics
4. Reproductive Medicine
5. Mental Health
6. End of life and organ transporentation
7. Research & clinical Trials

Reference Book

Medical Ethics & law, The cor curriculum
Author- Tony hope atla
Reference book no:- 16715 Center library

SEMESTER -VI

BRCT 6.1 T/P Respiratory Care Technology - Applied

Objective:

To learn about the clinical aspects of respiratory care and implement the Knowledge of anatomy, physiology and basic respiratory care technology concepts in clinical setting

Unit I

Documentation and Assessment for Respiratory care - 10 hours

1. Documentation inrespiratorycare
2. Assessment for need ofrespiratorycare and therapy
3. Respiratory care for pulmonary manifestation/complications of diseases ofother organsystems.

Unit II

Mechanical ventilation - Basics - 14 hours

4. Principles of mechanical ventilation: airway resistance, lung compliance, dead space ventilation, ventilatory failure, oxygenation failure, clinical conditions leading to mechanical ventilation, operating modes of mechanical ventilation.
5. Mechanical Ventilators: Classification, working principles, drive mechanism, control circuits, control variables, phase variables, output, waveform, alarm system, Basic ventilator waveformanalysis
6. Initiation of mechanical ventilation: indications, contraindication, initial ventilator settings, ventilator alarmsettings, hazards and complications.

Unit III

Mechanical ventilation - Monitoring - 14 hours

7. Monitoring in mechanical ventilation: concepts of monitoring, vital signs, chest inspection and auscultation, fluid electrolyte balance, arterial blood gases, oxygen and end tidal carbon dioxide monitoring.
8. Effects of various ventilator settings on the ventilation and oxygenation. Effect of PEEP: pulmonary considerations, effects on the cardiovascular system, haemodynamics, renal & neurological considerations.

Unit IV

Mechanical ventilation - Complications, weaning and Clinical situations-10 hours

9. Prevention and Recognition ofcomplications of ventilation
10. Weaning from mechanical ventilation: weaning and its failure, weaning criteria and indices, weaning procedure, signs, causes ofweaning failure.
11. Clinical situations with case studies of mechanical ventilation and management.

Unit V

Respiratory care in community - 12 Hours

12. Respiratory care at home
    a. Home oxygen therapy
    b. Home non-invasive ventilation therapy
    c. Home aerosol therapy
    d. Home mechanical ventilation: goals, indications, patient selection, equipment selection.
    e. Home plan for chest physical therapy and pulmonary rehabilitation.

13.Health Education and Training of patient and their family members or care givers, Disease prevention and health promotion

Practical:

1. Clinical situations and its management
2. Recognition of signs suggestive of complications related to ventilation
3. Home care plan preparation
4. Demonstration of various monitoring procedures
5. Initial ventilator settings for different clinical conditions
6. Operating mechanical ventilators, NIV, monitors, infusion and syringe pumps

Practical Exam Pattern:

Spotters
Drugs, Instruments and devices
X rays, Spirometry, DLCO, ABG and Basic Blood investigation reports
Case Discussion
Demonstration of Procedures
Operating Ventilator and modification of settings

Recommended Books

1. Egan's Fundaments of Respiratory Care 2
Mosby's Respiratory care equipment
3. Crofton and Douglas - Respiratory Diseases
4. Clinical Application of Mechanical Ventilation - David WChang
5. Pilbeam's Mechanical Ventilation - By J M Cairo

Online Resources:

American Association of Respiratory Care (AARC)

BRCT 6.2 T/P Respiratory Care Technology - Advanced

Objective:
To learn about advanced concepts of respiratory care by applying the knowledge of anatomy, physiology, basic and clinical respiratory care technology

Unit I

Newer Oxygen therapy devices and hyperbaric oxygen therapy - 10 hours

1. Newer Oxygen therapy devices: Portable/Ambulatory oxygen therapy
2. Hyper baric Oxygen therapy: decompression sickness, caissons disease, high altitude pulmonary oedema.

Unit II

Non Invasive Mechanical Ventilation - 14 hours

3. Noninvasive positive pressure ventilation: introduction, terminology, indications, CPAP, bilevel PAP.
4. Principles and Mechanism of action of NIV in various clinical settings
5. Contraindications and monitoring during NIV
6. NIV interface / mask and types

Unit III

Advanced Management of Mechanical Ventilation - 12 hours

1. Management & Troubleshooting of mechanical ventilation: strategies to improve ventilation, improve oxygenation, acid-base & electrolyte balance and their correction, fluid, electrolyte, nutrition balance and management, ventilator alarms and events, care of the ventilation circuit, care of the artificial airway, Safety mechanisms and alarms in ventilators
2. Pharmacotherapy for mechanical ventilation: drugs for improving ventilation, steroids, MDI medications, neuromuscular blocking agents like nitric oxide, propafol and anesthetic gases

Unit IV

Newer Modes and neonatal ventilation - 10 hours

1. Newer modes of ventilation
2. Neonatal mechanical ventilation: intubation and problems inherent to the neonate, surfactant replacement therapy, basic principles of neonatal ventilation, modes, initiation and maintenance, high frequency ventilation, liquid ventilation.

Unit V

Bronchoscopy and Medical Thoracoscopy - 14 hours

1. Bronchoscopy
    a) Instrument and components
    b) Indications and contraindications
    c) Pre Procedure evaluation
    d) Preparation of patient for procedure
    e) Monitoring during procedure
    f) Post procedure care

1. Medical Thoracoscopy
    a. Instrument and components
    b. Indications and contraindications
    c. Pre Procedure evaluation
    d. Preparation of patient for procedure
    e. Monitoring during procedure
    f. Post procedure care

Practical:

1. Operating mechanical ventilators, NIV, monitors, infusion and syringe pumps
2. Recognize and interpretation of basic ventilator waveforms
3. Identify and correction of blood gas, acid base and electrolyte abnormalities.
4. Demonstration of effects of various ventilator settings with test lung
5. Drugs used in Respiratory Care
6. Trouble shooting and maintenance of ventilators
7. Practical aspects of basic respiratory critical care
8. Preparing the patient and assisting in bronchoscopy

Practical Exam Pattern:

Spotters
Drugs, Instruments and devices
X rays, Spirometry, DLCO, ABG and Basic Blood investigation reports
Case Discussion
Demonstration of Assisting in Procedures - bronchoscopy and medical thoracoscopy
Operating Ventilator and modification of settings

Recommended Books

1. Egan's Fundaments of Respiratory Care
2. Mosby's Respiratory care equipment
3. Crofton and Douglas - Respiratory Diseases
4. Clinical Application of Mechanical Ventilation - David W Chang
5. Pilbeam's Mechanical Ventilation - By J M Cairo

Online Resources:

American Association of Respiratory Care (AARC)

BRCT 6.3 T/P Basic Intensive Care

Objective:
To learn about basic intensive care concepts by applying the knowledge of patient care, anatomy physiology and medical disorders.

Unit I

General ICU Care and Monitoring - 12 hours

1. General care and transport of ICU patient - eye, skin, bladder care, position, airways, drains, catheters. Transport of critically ill patient to and out of ICU, transport of patient with drains, airway, inotropes, mechanical ventilator.
2. Monitoring in critical care: vital signs, drains, ECG, fluid intake & output, invasive hemodynamic and central venous pressure monitoring

Unit II

Infection Control and Nutrition in ICU - 10 hours

1. Infection control in ICU: prevention of cross infection, personalprotection, antibiotics andpolicy.
2. Nutrition and Fluid balance - totalparentral nutrition, nasogastric tube, gastric tube, jejunostomytube care and feeding, IV Fluids.

Unit III

Systemic Diseases and Care in ICU - 14 hours

1. Cardiac care inICU: hypertension, hypotension, arrhythmias, cardiac arrest, ACLS
2. Respiratory care in ICU: airway care, tracheostomy care, endotracheal intubation, mechanical ventilation, care ofventilated patient, complications and weaning.
3. Renalfailure: types, etiology, complications, corrective measures
4. Hepatic failure: types, etiology, complications, corrective measures

Unit IV

Head Injury and Trauma care in ICU - 12 hours

1. Head injuryand Trauma Care: Glasgow coma scale, care of head injurypatient, poly trauma patient
2. Blood and blood products transfusion: Transfusion reactions & complications, Massive transfusion

Unit V

Acid base disorders, neonatal ventilation, imaging in ICU - 12 hours

1. Acid-base & electrolyte balance and their correction, fluid, electrolyte, nutrition balance andmanagement.
2. Neonatal mechanical ventilation: intubation and problems inherent to the neonate, basic principles ofneonatalventilation, modes, initiation and maintenance.
3. Miscellaneous: X-rays, ultrasound, chest and limb physicaltherapyin ICU

Practical:

1. Monitoring of Patients
2. Operating devices, ventilator and monitor settings for different clinicalconditions
3. Drugs used in Intensive Care
4. Trouble shooting and maintenance of monitors, equipments and ventilators

Practical exam pattern:

1. Identification and use of devices and equipments used for monitoring and care in ICUs
2. Demonstration of patient care procedures
3. Identifications of drugs used in ICU and its effects / precautions / complications.

Recommended Books

1. Introduction to Critical Care Nursing - Mary Lou Sole
2. Critical Care Notes: Clinical Pocket Guide - Janice Jones

Reference Books

1. AACN Essentials of Critical Care Nursing, American Association of Critical Care Nursing
2. Textbook of Critical Care: Expert Consult - Jean-Louis Vincent
3. The ICU Book - Paul L. Marino

BRCT 6.4 Polysomnography

Objective:
To sensitize about performing sleep study (polysomnography) and basics of PSG reporting.

Introduction to Sleep and Sleep Study Basics of Sleep Sleep Disorders Sleep related breathing disorders Sleep Apnoea / Hypopnoea Syndrome	4 hours
Polysomnography (PSG) Equipment Parameters monitored in sleep study Performing Sleep Study Recording of parameters	6 hours
Performing Polysomnography	12 hours
Basic Reporting and Interpretation	8 hours

BRCT 6.5 Hospital Management

1. **Quality Concepts:** Definition of Quality, Dimensions of Quality, Basic concepts of Total Quality Management, Quality Awards. Accreditations for hospitals: Understanding the process of getting started on the road to accreditation, National and International Accreditation bodies, overview of standards- ISO (9000 & 14000 environmental standards), NABH, NABL, JCI, JACHO.

2. **Hospital Information System:** Hospital Information System Management and software applications in registration, billing, investigations, reporting, ward management and bed distribution, medical records management, materials management and inventory control, pharmacy management, dietary services, management, information processing. Securityand ethical challenges.

3. **Inventory Control:** Concept, various costs of inventory, Inventory techniques-ABC, SDE / VED Analysis, EOQ models. Storage: Importance and functions of storage. Location and layout of stores. Management of receipts and issue of materials fromstores, Warehousing costs, Stock verification.

4. **Equipment Operations management:** Hospital equipment repair and maintenance, types of maintenance, job orders, equipment maintenance log books, AMCS, outsourcing of maintenance services, quality and reliability, concept of failure, equipment history and documents, replacement policy, calibration tests, spare parts stocking techniques and polices

5. **Biomedical Waste Management:** Meaning, Categories of Biomedical Wastes, Colour code practices, Segregation, Treatment of biomedical waste-Incineration and its importance. Standards for waste autoclaving, microwaving. Packaging, Transportation & Disposalof biomedical wastes.

REGISTRAR
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