



SHRI
DHARMASTHALA
MANJUNATHESHWARA
UNIVERSITY

Ordinance Governing
BPT Degree Course 4 ½ Years
Curriculum 2019-20

SHRI DHARMASTHALA MANJUNATHESHWARA UNIVERSITY

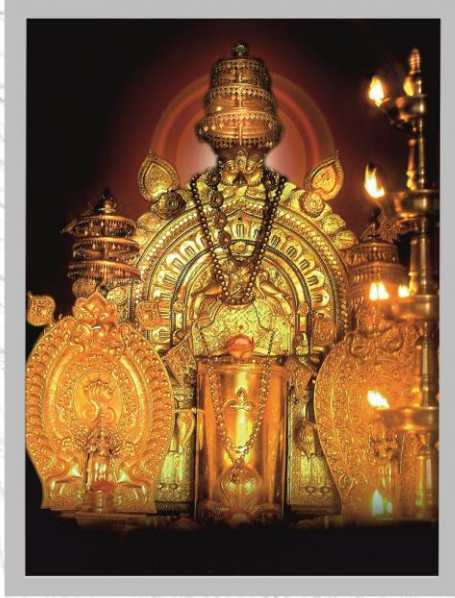
(A State Private University established under the Shri Dharmasthala Manjunatheshwara University
Act No 19 of 2018 of Government of Karnataka and Notification No. ED 261 URC 2018 dated 19th December 2018)

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|| Om Shri Manjunathaya Namaha ||



Shree Kshethra Dharmasthala

Edition Year : 2019-20

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THE LOGO

Poojya Dr D. Veerendra Heggade, Hon'ble Chancellor of the University, while searching for an appropriate Logo for the University, saw a photograph picked from Temple Architecture showing Wings of a Bird, sculpted in Indian style and wanted it to be incorporated in the logo for the University, as the Wings symbolize 'Spreading of Knowledge beyond Boundaries'. Further it was felt that the Central theme of the logo should be 'Rudra' (The Linga) with three wings on each side. In this way, the logo of the University was conceptualized.

Hence:

1. The central part represents **Rudra** who Demolishes Darkness.
2. The Three **horizontal lines on The Linga** stand for Samyak Darshan (Right Belief), Samyak Gyan (Right Knowledge) and Samyak Charitra (Right Conduct).
3. The **Wings** symbolize spreading of Knowledge across the boundaries.
4. Base line "**Truth Liberates**" highlights the Purpose of Education: to liberate oneself unconditionally. It shows that it is not discipline, nor knowledge nor the efforts to freedom that liberate but Truth is what liberates you from all your conditioning and ignorance.

The overall significance of Shri Dharmasthala Manjunatheshwara University's Logo is:

Darkness of ignorance is destroyed by the flow of knowledge to bring Liberty to everyone, by realizing the truth. And, it should spread globally without the boundaries as hindrance.



SHRI
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VISION

Shri Dharmasthala Manjunatheshwara University will set the highest standards of teaching and learning by awakening the intelligence of the students and nurturing the creativity hidden in them by creating an environment where the ancient wisdom blends with modern science, to transform them into whole human beings to face the challenges.

MISSION

- ▶ To ensure that the journey of education is inspiring, pleasant and enjoyable.
- ▶ Attract the best of teachers and students.
- ▶ Achieve high principles of trust, love and spirituality in the students.
- ▶ Create a collaborative, diverse and exclusive community.
- ▶ Transform the student of today to be a leader of tomorrow and a better human being.
- ▶ Produce passionate teachers.
- ▶ Evolve innovative teaching techniques.
- ▶ Create a peaceful environment.
- ▶ Prepare the student to face the social challenges.
- ▶ Create a University of which the Nation is proud of.
- ▶ Be an effective partner in Nation Building.
- ▶ Create an Eco-friendly University.
- ▶ Create a University based on the principles of beauty, love and justice.

||Om Shanti! Om Shanti! Om Shanti||



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MANJUNATHESHWARA
UNIVERSITY

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SDMU/Notif/110/45/2020

Date: 22.05.2020

NOTIFICATION

Affiliation for BPT & MPT Courses for the Year 2020-21

- Ref:
1. RGUHS Letter No. ACA/AFF/M-35/2019-20, Dated: 23-03-2019
 2. Govt. of Karnataka Notification No. ED 261 URC 2018, Dated: 19-12-2018
 3. Minutes of Academic Council Meeting of Shri Dharmasthala Manjunatheshwara University No. SDMU/AC/M-01/93/2019, Dated 20-03-2019
 4. Minutes of Board of Management Meeting of Shri Dharmasthala Manjunatheshwara University No. SDMU/BoM/M-02/94/2019, Dated 22-03-2019
 5. Minutes of Board of Governors Meeting of Shri Dharmasthala Manjunatheshwara University No. SDMU/BOG/M-02/95/2019, Dated 25-03-2019
 6. Shri Dharmasthala Manjunatheshwara University Notification of Affiliation for BPT & MPT Courses for the Year 2019-20, No. SDMU/Notif/268/2019, Dated: 12-07-2019

On the basis of the Reports of Local Assessment Committee dated 22-05-2020 and Letters of Permission from Govt. of Karnataka, Shri Dharmasthala Manjunatheshwara University grants affiliation for the academic year 2020-21, as per Section 35 (ii) of Karnataka Act No. 19 of 2018 (Shri Dharmasthala Manjunatheshwara University Act 2018), for conducting BPT course and the below listed PG Degree Courses at SDM College of Physiotherapy, Dharwad with an intake specified as mentioned below against each course, subject to fulfillment of conditions stipulated by the Government of Karnataka. This is, however, subject to compliance with the relevant rules, regulations and norms related to admissions notified by the university.

Sl. No.	Course / Program	Intake
Under Graduate Degree		
1	Bachelor of Physiotherapy	60
Post Graduate Degree		
1	MPT in Musculoskeletal Disorders & Sports	05
2	MPT in Neurological and Psychosomatic Disorders	05
3	MPT in Cardio-Respiratory Disorders	05
4	MPT in Community Physiotherapy	05
5	MPT in Pediatrics	05




Lt. Col. U. S. Dinesh (Retd.)^{MD,MIAC}
REGISTRAR
REGISTRAR,
Shri Dharmasthala Manjunatheshwara
University, Dharwad

To: 1. The Principal, SDM College of Physiotherapy, Dharwad

Copy to: 1. Hon'ble Chancellor, Shri Dharmasthala Manjunatheshwara University, Dharwad
2. Vice-Chancellor, Shri Dharmasthala Manjunatheshwara University, Dharwad
3. Principal Secretary, Department of Higher Education, Government of Karnataka
4. Principal Secretary, Department of Medical Education, Government of Karnataka
5. Principal Secretary, Department of Health & Family Welfare, Government of Karnataka
6. Chairman, University Grants Commission, New Delhi

BPT REGULATION AND CURRICULUM – 2019
4 ½ YEAR DEGREE COURSE
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Chapter 1

1.1A DEFINITION OF PHYSIOTHERAPY & PHYSIOTHERAPY PROFESSIONAL

“Physiotherapy means a system which includes comprehensive examination, treatment, advice and instructions to any persons preparatory to or for the purpose of or in connection with movement/ functional dysfunctional, bodily malfunction, physical disorder, disability, healing and pain from trauma and disease, physical and mental conditions using physical agents, activities and devices including exercise, mobilization, manipulations, electrical and thermal agents and other electrotherapeutics for prevention, screening, diagnosis, treatment, health promotion and fitness”. (Ministry of Health & Family Welfare - Allied Health Section - 2017) This includes treatment preparation, planning, treatment delivery, clinical and rehabilitative care of the patient on a daily basis during treatment and immediate post treatment review. However, the role of the Physiotherapist always encompasses the safe and accurate delivery of the physiotherapy treatment. As the physiotherapy professional in daily contact with the patient it also includes monitoring of daily improvement of the patient according to his/her condition. Furthermore the PTs liaise with all the other associated professionals in ensuring that the needs of the patient are met.

Physiotherapy Professional:

Physiotherapy professional is a person who practices physiotherapy by undertaking comprehensive examination and appropriate investigation, provides treatment and advice to any persons preparatory to or for the purpose of or in connection with movement or functional dysfunction, malfunction, disorder, disability, healing and pain from trauma and disease, using physical modalities including exercise, mobilisation, manipulations, electrical and thermal agents and other electro therapeutics for prevention, screening, diagnosis, treatment, health promotion and fitness. The physiotherapist can practice independently or as a part of a multi- disciplinary team and has a minimum qualification of a baccalaureate degree.

(The Allied And Healthcare Professions Bill, 2018)

1.2 The aims of the recommended curriculum are to produce Physiotherapists who are

- Technically and clinically competent for independent decision making.
- Enable to assess a patient.
- Aware of patient conditions and treatment along with the importance of quality assurance.
- Understand the theoretical basis for evidence based practice.
- Effective members of the multidisciplinary team.
- Prepared to participate in or initiate research into practice.

1.3 Learning Objectives: At the completion of this course, the student should be

1. Able to delineate the cognitive, affective and psychomotor skills deemed essential for completion of this program and to perform as a competent physiotherapist who will be able to evaluate, diagnose, plan & execute physiotherapy treatment independently or along with the interdisciplinary team.
2. Able to Evaluate patients for impairments and functional limitations and able to execute all routine physiotherapeutic procedures as per the treatment protocol.
3. Able to operate and maintain physiotherapy equipment used in treatment of patient, physiotherapy treatment planning (both electrotherapy and exercise therapy) & procedures independently or along with the interdisciplinary team.
4. Able to provide adequate education about the movement science and exercise therapy techniques to the patient and its benefits.

1.4 Expectations from the future graduate in the providing patient care.

1. Coursework entitles independent physiotherapy assessment and treatment in hospital setup, private clinic and primary health centers by the graduates.
2. The coursework is designed to train students to work as independent physiotherapists or in conjunction with medical, surgical, sports, community rehabilitation management teams including medical doctor (MD Physical Medicine, Orthopaedician, Neurologist and Cardiologist etc.),

Nurses, Dietician, Orthotist and Prosthetist, Physiotherapy Assistant, General Duty Assistant and other members in the application of physiotherapy treatment protocol. Students/graduates will be autonomous practitioners who are able to diagnose and treat movement disorders as per red and yellow flags.

3. Course work includes anatomy, physiology, electrotherapy, exercise therapy, biomechanics, pharmacology etc. The student will be skilled in physical/ functional diagnosis, treatment planning, management, administration of physiotherapy treatment and provision of patient support.
4. Employment opportunities can be found in hospitals/nursing homes/sports teams/fitness centers/Community Rehabilitation /Health planning boards/health promotions services in both private and public sectors as well as in independent physiotherapy clinics.
5. Bachelor of Physiotherapy (BPT) graduate is encouraged to pursue further qualification to attain senior position in the professional field, also to keep abreast with the recent advances and new technology. The professional should opt for continuous professional education credits offered by national and international institutes.
6. The graduate will be a competent and reflective physiotherapy practitioner who can function safely and effectively while adhering to legal, ethical and professional standards of practice in a multitude of physiotherapy settings for patients and clients across their lifespan and along the continuum of care from wellness and prevention to rehabilitation of dysfunction.
7. The graduate will utilize critical thinking, critical inquiry and evidence based practice to make clinical decisions essential for autonomous practice.
8. The graduate will function as an active member of professional and community organizations. The graduate will be a service- oriented advocate dedicated to the promotion and improvement of community health.
9. The graduate will demonstrate lifelong commitment to learning and professional development.

Chapter 2

2.1 Selection procedure:

1. Candidate should have passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board with English as one of the subjects and should have scored minimum of 45 % marks in Physics, Chemistry, Biology (Botany & Zoology). In respect of candidates belonging to Scheduled Castes & Scheduled Tribes, the marks obtained in Physics, Chemistry, Biology (Botany & Zoology) together in qualifying examination is not less than 40 %.
2. Candidates who have studied abroad and have passed the equivalent qualification with English as one of the languages and 45% marks in Physics, Chemistry, Biology (Botany & Zoology) will be evaluated by Shri Dharmasthala Manjunatheshwara University for the eligibility of admission.
3. Candidates who have passed the Senior Secondary school Examination of National Open School with a minimum of 5 subjects with any of the following group subjects.
 - a) English, Physics, Chemistry, Biology (Botany & Zoology)
 - b) English, Physics, Chemistry, Biology and any other language
4. Candidate should have attained the age of 17 years as on 31st December of the year of admission (current year).
5. Candidate has to furnish at the time of submission of application form, a certificate of Physical fitness from a registered medical practitioner and two references from persons other than relatives testifying to satisfactory general character.
6. Admission to Bachelor of Physiotherapy course shall be made on the basis of eligibility (point 1 of selection procedure) and an entrance test to be conducted for the purpose.
 - a) Entrance test, to be conducted by the university as per the syllabus under 10+2, subject-wise distribution of questions will be as 30% in Physics, 35% in Biology, 15% in Chemistry, 10% in English (Language & Comprehension) and 10% in general awareness about health related methods.
 - b) Successful candidates on the basis of written Test will be called for the interview. Marks obtained in PCB of 10+2 will be added to the

entrance exam and interview marks. Then list will be displayed according to their rankings (40% of PCB marks + 30% entrance marks + 30% marks in interview).

- c) During subsequent counselling (s) the seat will be allotted as per the merit of the candidate depending on the availability of seats.
- d) Candidate who fails to attend the Entrance Test on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent authority under special circumstances.

2.2 PROFESSIONAL DRESS CODE STANDARDS

It is important to portray a professional image. A physiotherapist with inappropriate dress, grooming, or conduct can damage the patients confidence in the quality of their care, sometimes even resulting in delay in the restoration of health. Haircuts, hairstyling and personal grooming need to be neat, conservative and inconspicuous.

Modest formal wear is appropriate on campus and in class.

Clinical / Lab Dress: Aprons and Identity card for all clinical assignments, any class that is held in a clinical facility and in any class where patients are present is mandatory.

2.3 DURATION OF THE COURSE-

The duration of the BPT Regular Course shall be four and half years including internship of six months (4 years & 6 Months).

2.4 MEDIUM OF INSTRUCTION-

English shall be the medium of instruction for all the subjects of study and for the examinations of the BPT Course.

2.5 COMMENCEMENT OF THE COURSE -

The course shall commence as per the calendar of events of the University.

2.6 ATTENDANCE

A candidate is required to attend at least 75 percent of the total classes conducted in a year in all subjects prescribed for that year, separately, in theory and practical / clinical to become eligible to appear for the university examination.

COURSE OF STUDY - SUBJECTS AND HOUR DISTRIBUTION

First year BPT [Duration 0 -12 months]					
Sl No	Subject	Teaching hours			
		Weekly Class hours	Total	Theory	Practical
1	Anatomy	9	265	160	105
2	Physiology	7	210	150	60
3	Biochemistry	3	80	80	
4	Human Biomechanics	6	230	125	105
5	Psychology	2	60	60	
6	Sociology	2	60	60	
Subsidiary subjects: Not for University Examination					
7	English, Kannada, Communication, Soft skills	2	120	120	
8	Clinical Education & Orientation to Physiotherapy	2	90		90
9	Basic Nursing & First Aid	1	30	20	10
10	Integrated seminar & Problem Based learning sessions	3	80	80	
	Total	37	1200	800	400

2.7 INTERNAL ASSESSMENT

There should be a minimum of two sessional examinations and one preliminary examination in each academic year. An average of all three examinations will be considered for the University examination. Proper record which forms the basis of the Internal Assessment should be maintained for all students and should be

available for scrutiny. The marks of periodical tests should be displayed on the student notice board.

A Candidate must obtain a 35 % marks in theory and practical separately in internal assessment to be eligible to write the university examination.

2.8 SCHEDULE OF EXAMINATION

There will be two examinations in a year (main and supplementary), to be conducted as per notification issued by the University from time to time.

Final examination of First year BPT course shall be held at the end of 1st year. The particulars of subjects for examinations and distribution of marks are shown in Table 1.

The examination for main subjects shall be conducted by the University and for subsidiary subjects by the college.

2.9 CRITERIA FOR PASS

Main subjects

A candidate is declared to have passed university examination in a subject, if the candidate secures 50% of the marks in theory and 50% in practicals separately. For computation of 50% marks in theory the marks scored in the internal assessment and viva voce, shall be added to the university conducted written examination and for a pass in practical, the marks scored in university conducted practical examination and internal assessment (practical) shall be added together

2.10 SUBSIDIARY SUBJECTS

For a pass in Subsidiary subjects, a candidate shall secure 35% of the total marks prescribed for the subject. The marks obtained should be sent to the University 15 days prior to the commencement of University examination

2.11 SCHEME OF EXAMINATION - Subjects and Distribution of Marks (table 1)

		Theory			Practical			Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment	
	Subject	Time	Maximum Marks	Maximum Marks	Maximum Marks	Maximum Marks	Maximum Marks	
1	Human Anatomy	3 Hours	100	20	40	30	10	200
2	Physiology	3 Hours	100	20	40	30	10	200
3	Biochemistry	3 Hours	80	20	-	-	-	100
4	Biomechanics	3 Hours	100	20	40	30	10	200
5	Section A- Psychology	3 Hours	40	10	-	-	-	100
	Section B- Sociology		40	10	-	-	-	

2.13 QUESTION PAPER PATTERN FOR BPT EXAMINATION

SUBJECTS HAVING MARKS OF 100		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
Multiple Choice Questions	20	1
long essay	2 (any two out of three)	10
short essay	8	5
short answers	10	2
SUBJECTS HAVING MARKS OF 80		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
Multiple Choice Questions	20	1
long essay	2 (any two out of three)	10
short essay	4	5
short answers	10	2
SUBJECTS HAVING SECTION A & SECTION B [40 MARKS + 40 MARKS = 80 MARKS]		

SECTION A		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
Multiple Choice Questions	10	1
long essay	1 (any one out of two)	10
short essay	2	5
short answers	5	2

SUBJECTS HAVING SECTION A & SECTION B [40 MARKS + 40 MARKS = 80 MARKS]		
SECTION A		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
Multiple Choice Questions	10	1
long essay	1 (any one out of two)	10
short essay	2	5
short answers	5	2

PRACTICAL		
MAXIMUM MARKS = 40		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
LONG CASE	1	20
SHORT CASE	2	10

MAXIMUM MARKS = 30

VIVA-VOCE

2.14 DECLARATION OF CLASS

- a. A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 75% of marks or more of grand total marks prescribed will be declared to have passed the examination with Distinction.
- b. A candidate having appeared in all subjects in the same examination and passed that examination in the first attempt and secures 65% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in First Class.
- c. A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 50% of marks or more but less than 65% of grand total marks prescribed will be declared to have passed the examination in Second Class.
- d. A candidate passing the university examination in more than one attempt shall be placed in Pass class irrespective of the percentage of marks secured by him/her in the examination.
- e. The marks obtained by a candidate in the subsidiary subjects shall not be considered for award of Class or Rank.

2.15 PROMOTION CRITERIA

Candidate is eligible to attend to the next academic year provided the candidate has passed all the subjects in the previous year. The supplementary examination shall be conducted after the declaration of the results. If the candidate fails (even in one subject) in the supplementary exam, they will not be eligible to be promoted to the next academic year.

2.16 MAXIMUM DURATION OF THE PROGRAM

Candidates should complete the Bachelor of Physiotherapy degree course within a period of eight years from the date of joining in the course.

2.17 DISCHARGE FROM THE PROGRAM

1. "If a student admitted to a course, and for any reason not able to complete the course or qualify for the degree by passing the examinations prescribed within a period comprising twice the duration prescribed in the Regulations for the concerned course, the candidate will be discharged from the said course, their name will be taken off the rolls of the University and the candidate will not be permitted to attend classes or appear for any examination conducted by the University thereafter."

2. "In respect to internship if a student is for any reason not able to complete the internship within a period comprising twice the duration prescribed in the Regulations for the concerned course, such cases will be placed before a Committee to be constituted by the Vice-Chancellor for making appropriate decision on a case to case basis, based on individual merits.

2.18 VACATION

The period(s) of vacation will be decided by the Head of the Institution.

2.19 INTERNSHIP

All students of Bachelor of Physiotherapy must undergo a compulsory rotatory internship for a period of 6 months after being declared to have passed all examinations in all subjects. The internship will be carried out in the mother University (SDMU) itself.

No candidate shall be awarded degree certificate without successfully completing six months of Internship.

The Internship should be rotatory and cover clinical branches concerned with Physiotherapy such as Orthopaedics, Cardio pulmonary including ICU, Neurology, Neurosurgery, Paediatrics, General Medicine, General Surgery, Obstetrics and Gynaecology and community services both inpatient and outpatient departments.

The 6 months of rotational posting must be covered in the following pattern. 1 month Physiotherapy OPD (including Pediatrics and OBG wards), 1 month Orthopedic wards, 1 month General Medicine wards (including MICU and CCU), 1 month General Surgery wards (including CVTS wards, CVTS-ICU and Burns), 1 month Neurology and Neurosurgery wards (including Neuro ICU) and 1 month Community Posting.

During this period the candidate should take up one project which is mandatory in their successful completion of internship.

The student must maintain a logbook. On completion of each posting, the same will have to be certified by the faculty in charge of the posting for both attendance as well as work done. On completion of all six postings, the duly completed logbook will be submitted to the Principal/Head of program to be considered as having successfully completed the internship program.

Chapter 3
Main Subjects: For University Examination
3.1 ANATOMY

Course Description

Students are trained to have knowledge of structure of human body essential during their clinical studies, with particular reference to musculoskeletal, nervous, cardio-respiratory systems along with a brief account of functional & topographical anatomy of abdomen & pelvis.

Teaching Hours	
Subject Title	Anatomy
Duration	0-12 Months
Total Hours	265
Lecture	160 hours
Demonstration	105 hours
Total Hours / week	9 Hrs hours
Lecture	3 Hours/week
Practical	5 Hours/week
Seminal / Tutorials	1 Hour/week
Method of Assessment	Written, Oral, Practical

GENERAL ANATOMY

S No	Topic	Theory-Teaching hours	Practicals/ Demonstration Teaching hours
1	Introduction -Basic Anatomical -Nomenclature, Planes, Positions -common anatomical terminologies- tuberosity/ tubercle, trochanter, groove, sulcus, ridge etc.	1 hour	1 hour
2	Skin & Superficial fascia -Structure & Function -Appendages	1 hour	

3	Deep Fascia -Structure, Modifications & -Functions of Deep fascia	1 hour	
4	Connective tissue- classification, composition, functions	1 hour	1 hour
5	Muscles -Classifications with examples -Nomenclature of Muscles -Origin, insertion, nerve supply and actions	1 hour	1 hour
6	Blood Vessels -Structural & Functional classifications with examples -Types of Anastomosis -Vascular Diseases	1 hour	1 hour
7	Neurology -Parts of Nervous system-central nervous system, peripheral nervous system and autonomic nervous system -Structure & functions of different cells of nervous System -Typical Spinal Nerve -Synapses -Neurotransmitters -Neuromuscular junction -Reflex arc -Diseases of Nervous System	1 hour	1 hour
8	Bones - Classification and types according to morphology and development - Composition, and functions -Gross Anatomy of long bone -Development & centers of ossification -Applied Anatomy	1 hour	1 hour
9	Joints -Classification with examples -Structure and types of fibrous joints -Structure and types of cartilaginous joints -Structure of Typical Synovial joint -Hilton's Law - Factors influencing movements -Body levers -Anatomical Correlation with diseases of joints	1 hour	1 hour

	-Bio mechanics		
10	Lymphatic System -Formation & components of Lymphatic System in detail -Functions of Lymphatic system	1 hour	1 hour
	Total	10 hours	8 hours

UPPER LIMB

S No	Topic	Theory-Teaching hours	Practicals/ Demonstration -Teaching hours
1	Pectoral Region - Mammary Gland - Clavi-pectoral fascia - Muscles	1 hour	1 hour
2	Axilla - Boundaries & contents in detail - Brachial plexus - Axillary vessels - Axillary Group of Lymph Nodes	2 hours	2 hours
3	Back & Scapular Region - Muscles, Neuro vascular structures - Intermuscular spaces - Deltoid muscle & structures under it	1 hour	1 hour
4	Shoulder Joint Detailed description of joint - Type, articular surfaces, ligaments, movements and muscles producing movements, applied anatomy	1 hour	1 hour
5	Arm - Anterior compartment & its contents - Posterior compartment & its content	1 hour	1 hour
6	Elbow Region - Cubital Fossa – Boundaries & content - Anastomosis around elbow joint - Elbow joint in detail	1 hour	2 hours
7	Forearm -Anterior compartment contents in detail	2 hours	

	- Posterior compartment contents in detail - Radio - ulnar joints		
8	Wrist & Hand - (Palmar & Dorsal Aspect) - Retinacula - Muscles & Neuro-vascular structures of hand - Wrist joint -1st Carpometacarpal joint -Carpometacarpal joints -Interphalangeal joints -Surgical Spaces of Hand	3 hours	2 hours
9	Joints of Upper limb -shoulder, elbow, radioulnar, wrist, and joints of hand	2 hours	1 hour
10	Blood vessels & lymphatic drainage of upper limb	1 hour	1 hour
11	Nerves of Upper limb	2 hours	1 hour
12	Muscles of Upper limb	2 hours	1 hour
	Total	19 hours	14 hours

LOWER LIMB

S No	Topic	Theory Teaching hours	Practicals/ Demonstration Teaching hours
1	Introduction of Lower Limb -Venous drainage of Lower Limb -Cutaneous nerves of Lower Limb -Arterial supply of Lower Limb -Lymphatic drainage of Lower Limb	3 hours	1 hour
2	Thigh Region -Anterior compartment & its contents -Lateral side of thigh -Adductor compartment & its contents -Posterior compartment & its contents	3 hours	2 hours
3	Gluteal Region Structures in detail-bones, joints, muscles, bold vessels and nerves	1 hour	1 hour
4	Hip Joint Detail description of joint- Type, articular surfaces, ligaments, movements and	1 hour	1 hour

	muscles producing movements, applied anatomy		
5	Knee Region -Popliteal fossa -Knee joint in detail - Type, articular surfaces, ligaments, movements and muscles producing movements, applied anatomy	2 hours	1 hour
6	Leg Region - Anterior compartment in detail - Lateral compartment in detail - Posterior compartment in detail	2 hours	2 hours
7	Foot -Skin, nerve supply -Detail description of ankle joint - Type, articular surfaces, ligaments, movements and muscles producing movements, applied anatomy -Retinaculae -Arrangement of Structures in sole of foot -Arches of foot in detail -Talo-calcaneo navicular joint -Subtalar joints -Dorsum of foot	2 hours	1 hour
8	Joints of Lower limb -hip, knee, tibiofibular, ankle, subtalar, tarsometatarsal, metatarsophalangeal and interphalangeal joints with applied anatomy	2 hours	1 hour
9	Blood vessels of lower limb - arterial supply and venous drainage with applied anatomy	2 hours	1 hour
10	Nerves of lower limb with applied anatomy	2 hours	1 hour
	Total	20 hours	12 hours

REGIONAL ANATOMY

THORAX

S No	Topic	Theory-Teaching hours	Practicals/ Demonstration Teaching hours
1	<p>Introduction to Thorax</p> <p>-Intercostal spaces – boundaries, inter costals muscles, blood vessels, nerves, origin, insertion, nerve supply, actions of intercostals muscles, movements of ribs typical spinal nerve- course and branches, intercostal drainage tube</p>	1 hour	1 hour
2	<p>Thoracic Cage</p> <p>- Superior Aperture</p> <p>- Inferior Aperture</p> <p>Thoraco-Abdominal diaphragm- parts, origin, insertion, nerve supply, openings, actions, applied anatomy</p> <p>- Respiratory movements</p>	2 hours	1 hour
3	<p>Outline of respiratory passages- Trachea</p> <p>Pleura – position, parts, relations, blood supply and nerve supply, pleural effusion</p> <p>Lungs- right lung, left lung- borders, apex, base, surfaces, relations, structures in hilum, bronchopulmonary segments, blood supply, nerve supply, postural drainage, common diseases of lungs and pleura</p>	3hours	2 hours
4	<p>Cardiovascular system</p> <p>- Pericardium- fibrous pericardium, serous pericardium- nerve supply, blood supply, pericardial tamponade</p> <p>Heart- position, shape, chambers of heart, valves, interatrial and interventricular septum, openings in different chambers, conducting system of</p>	3 hours	3 hours

	heart- SA node (pace maker) , AV node, bundle of His, Purkinje fibres, Blood supply and nerve supply of heart, diseases of heart- angina pectoris, myocardial infarction, angiography, angioplasty, coronary artery bypass grafting, aorta – parts, branches, superior venacava, inferior venacava, pulmonary trunk, pulmonary veins- applied anatomy		
5	Mediastinum- divisions and contents - Oesophagus - Thoracic duct - Azygous system of veins - Descending thoracic aorta -Sympathetic chain - Thymus	1 hours	1 hour
	Total	10 hours	8 hours

ABDOMEN & PELVIS

S No	Topic	Theory-Teaching hours	Practicals/ Demonstration Teaching hours
1	Anterior Abdominal wall - Layers in detail - Dermatomes - Rectus sheath - Inguinal canal	2 hours	1 hour
2	Peritoneum Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum, peritonitis, peritoneal dialysis, paracentesis.	1 hour	1 hour
3	Stomach Location, size, shape, features, blood supply, lymphatic drainage, nerve supply, diseases of stomach	1 hour	1 hour
4	Small Intestine - Duodenum	1 hour	1 hour

	- Jejunum & Ileum – location, size, shape, features, blood supply , lymphatic drainage, nerve supply and diseases of small intestine		
5	Large Intestine Caecum & Appendix, Colon - location, size, shape, features, blood supply , lymphatic drainage, nerve supply and diseases of large intestine	1 hour	1 hour
6	Liver, Gall bladder, Pancreas, Spleen -location, size, shape, features, blood supply , lymphatic drainage, nerve supply and common diseases of these organs	2 hours	1 hour
7	Post Abdominal Wall -Kidney, Suprarenal Gland -Ureters - location, size, shape, features, blood supply , lymphatic drainage, nerve supply and common diseases of these organs	2 hours	1 hour
8	Post Abdominal Wall Thoraco – Abdominal Diaphragm -Abdominal Aorta & its branches -Inferior Vena Cava & its tributaries -Muscles , psoas major, quadrates lumborum - nerves, lumbar sympathetic chain	2 hours	1 hour
9	Pelvis -Urinary Bladder, male reproductive system- testis, epididymis, , ductus deferens, seminal vesicles, Prostate, ejaculatory ducts, Urethra Female reproductive system--Uterus, Vagina, Fallopian Tubes, Ovary -Rectum, Anal Canal, Ischio-Rectal Fossa - location, size, shape, features, blood supply , lymphatic drainage, nerve supply and common diseases of these organs -Pelvic Diaphragm, Urogenital diaphragm , perineum-perineal pouches, perineal body-functions and applied anatomy	6 hours	2 hours
	Total	18	10

ENDOCRINE SYSTEM-

S No	Topic	Theory-Teaching hours	Practicals/ Demonstration Teaching hours
1	Pituitary gland, hypothalamus, pineal gland -position, shape, size blood supply and functions	1 hour	1 hour
2	Thyroid parathyroid glands -position, shape, size blood supply and functions	1 hour	1 hour
3	Adrenal glands, endocrine pancreas-position, shape, size blood supply and functions	1 hour	1 hour
4	Testis, ovary -position, shape, size blood supply and functions	1 hour	1 hour
	Total	4 hours	4 hours

HEAD & NECK

S No	Topic	Theory-Teaching hours	Practicals/ Demonstration Teaching hours
1	Head -Scalp , face -Lacrimal Apparatus	2 hours	2 hours
2	Parotid Region Parotid Gland & Structures related to it	1 hour	1 hour
3	Neck - Deep Cervical Fascia - All layers & its reflection -Posterior triangle -Suboccipital triangle -Anterior Median Region of neck -Anterior triangle- Submental triangle -Digastric triangle -Carotid triangle & Submandibular region -Thyroid gland -Deep structures of neck -Subclavian artery, cervical part of	4 hours	3 hours

	sympathetic chain & its branches in detail		
4	Cranial Cavity -Meninges -Dural venous sinuses , Cavernous sinus in detail -Cranial Nerves -Pituitary Gland	3 hours	2 hours
5	Orbit – extraocular muscles, lacrimal gland, optic nerve, oculomotor nerve, trochlear nerve, ophthalmic nerve, ophthalmic artery , ophthalmic veins, ciliary ganglion	1 hour	1 hour
6	Infra-temporal Fossa -Muscles of Mastication -Maxillary Artery -Mandibular Nerve & Otic Ganglion -Temporo-Mandibular Joint	3 hours	2 hours
7	Nose - nasal septum & lateral walls of Nasal cavity -Para-nasal Air sinuses	1 hour	1 hour
8	Oral Cavity -Palate -Tongue	1 hour	1 hour
9	Pharynx -Nasopharynx – Eustachian tube -Oropharynx- Palatine Tonsil -Laryngopharynx – Piriform Fossa -Walls of Pharynx	1 hour	1 hour
10	Larynx -Skeleton & Muscles of Larynx -Interior of larynx -Glottis	1 hour	1 hour
11	Ear -External Ear -Middle Ear -Inner ear	2 hours	1 hour
	Total	20 hours	16 hours

HISTOLOGY

S No	Topic	Theory-Teaching hours	Practicals/ Demonstration-Teaching hours
1	Microscope & common objects under microscope -Different types of microscopes -Compound microscope Parts & Functions of working principal of different types of microscopes -H & E staining	2 hours	1 hour
2	Basic tissues of the body-classification-epithelial tissue, connective tissue, muscular tissue, nervous tissue	1 hour	-
3	Epithelium -Types & Function of each Epithelium -Glands	1 hour	1 hour
4	Connective Tissue Components, classification & -Functions of connective tissue	1 hour	1 hour
5	Cartilage -Components of cartilage -Types, Structure in detail	1 hour	1 hour
6	Integumentary system -Types, Structure, Functions-Skin - Skin Appendages	1 hour	1 hour
7	Exocrine glands- salivary glands and endocrine glands- pituitary, thyroid, parathyroid, pancreas, suprarenal glands	3 hours	2 hours
8	Bone -Types -Structural composition of -bone	1 hour	1 hour
9	Muscular Tissue -Types - skeletal muscle, cardiac	1 hour	1 hour

	muscle, smooth muscle Structural organization		
10	Nervous Tissue -Classification of neurons, structure of a multipolar neuron, neuroglial cells -Classification of Nerve Fibres with examples -Myelination of nerve fibres -Structure of different types of ganglia	1 hour	1 hour
11	Blood – Vascular System Structural classification of blood vessels in detail – arteries, veins, capillaries	1 hour	1 hour
12	Lymphatic System Structure of Primary & Secondary lymphatic organs- lymph node, thymus, spleen, palatine tonsils	2 hours	1 hour
	Total	16 hours	12 hours

NEURO ANATOMY

S No	Topic	Theory – Teaching hours	Practicals/ Demonstration – Teaching hours
1	Organization of nervous system- central nervous system, peripheral nervous system, autonomic nervous system -spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system	2 hours	1 hour
2	Cranial nerves	2 hours	1 hour
3	a) Peripheral nerves b) Neuromuscular junction c) Sensory end organs	2 hours	1 hour
4	CNS – a) Spinal segments and areas	1 hour	1 hour
5	CNS- b) Brain stem	1 hour	1 hour
6	CNS- c) Cerebellum	1 hour	1 hour
7	CNS- d) Midbrain – Superior colliculi, Inferior colliculi	1 hour	1 hour

8	CNS e) Thalamus & Hypothalamus Features, Relations & Functions	1 hour	1 hour
9	CNS- f) Corpus striatum	1 hour	1 hour
10	CNS- g) Cerebral hemispheres	2 hours	1 hour
11	CNS- h) ventricles of brain- lateral ventricles, third ventricle, fourth ventricle- CSF formation & circulation	1 hour	1 hour
12	CNS- i) Blood supply of brain	1 hour	1 hour
13	CNS- j) Basal ganglia	1 hour	1 hour
14	CNS- k) pyramidal system	1 hour	1 hour
15	CNS- l) Pons, Medulla oblongata & extrapyramidal system	1 hour	1 hour
16	CNS- m) anatomical integration of nervous system	1 hour	-
	Total	20 hours	15 hours

EMBRYOLOGY

S No	Topic	Theory – Teaching hours	Models demonstration
1	Ovum, spermatozoa, fertilization and formation of the germ layers and their derivatives	2	3 hours
2	Development of skin, fascia, blood vessels, lymphatics	2	
3	Development of bones, axial and appendicular skeleton and muscles	1	
4	Neural tube, brain vessels and spinal cord	1	
5	Development of brain and brain stem structures	2	
	Total	8 hours	3 hours

RADIOLOGICAL ANATOMY

S No	Topic	Teaching hours
1	Normal X-rays Normal Skiagrams of 1. Upper limb 2. Lower limb 3. Thorax 4. Abdomen & Pelvis 5. Head & Neck	Demonstration – 3 hours

SURFACE ANATOMY

S No	Topic	Teaching hours
1	Surface anatomy of blood vessels and nerves in upper limb	1 hour
2	Surface anatomy of blood vessels and nerves of lower limb	1 hour
3	Surface anatomy of thorax- pleural reflections, lungs markings, heart marking, arch of aorta, valves of heart, apex beat	1 hour
4	Surface anatomy of abdomen- transpyloric plane, transtuberular plane, 9 regions of abdomen, markings of stomach, liver spleen, Mc Burney's point, base of appendix, kidneys	1 hour
5	Surface anatomy of Head , Neck and Brain- common carotid artery, internal jugular vein, thyroid gland, parotid gland, submandibular gland, vagus nerve, spinal accesoor nerve, facial nerve in face, facial artery, pterion, maxillary sinus, superior saggittal sinus, pterion, suprameatal triangle, bony prominences	1hours
	Total	5 hours

OSTEOLOGY

S No	Topic	Teaching hours
1	Upper Limb -Clavicle, Scapula, Humerus, -Radius, Ulna Articulated Hand (Features & Attachments & Relation of each bone)	Lecture + Demonstration – 25 hours
2	Lower Limb -Hip bone, Femur, Patella, -Tibia, Fibula, Articulated Foot	
3	Thorax -Sternum, Ribs, Thoracic -Vertebrae	
4	Lumbar vertebra, Sacrum, Articulated Pelvis -Sex differentiation of pelvis -Features & Attachments & -Relation of each bone	
5	Skull - All Normas All cranial fossae, Individual bones of -skull -Mandible -Cervical vertebrae -Hyoid bone -Fetal Skull	

PRACTICALS

List of practicals / Demonstration

Topics

1. Upper extremity including surface anatomy (20 hours)
2. Lower extremity including surface anatomy (20 hours)
3. Head, neck, brain and spinal cord including surface anatomy (20 hours)
4. Thorax and abdomen- organs , including surface anatomy, abdominal wall muscles, joints (10 hours)
5. Histology- elementary tissues including surface anatomy (10 hours)
6. Embryology models, charts and X rays (10 hours)

Demonstration of the muscles of the whole body and organs in thorax and abdomen in a cadaver

Demonstration of movements of joints

Surface marking of the lung, pleura, fissures and lobes of lungs, heart, liver, spleen, Kidneys, cranial nerves, spinal nerves, and important blood vessels
Identification of body prominences on inspection and palpation especially of extremities.

Points of palpation of nerves and arteries

Recommended text books

1. Krishna Garg. B. D. Chaurasia's Human Anatomy, Regional and applied Volume I, II, III, IV edition 8th CBS Publishers and Distributors, New Delhi 2018.
2. B. D. Chaurasia , Hand book of Anatomy
3. Datta A. K. essentials human anatomy, volume 1, 2, 3, 4 , 2013
4. Singh Inderbir, Text book of Histology
5. Vishram Singh, Neuro anatomy
6. Richard Snell, Clinical Anatomy

Practical manuals

1. G J. Rromane , Manual of practical Anatomy volume 1, 2, 3, 14th edition

3.2 PHYSIOLOGY

Course Description

The course in Physiology over the first year is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body.

The major topics covered include the following: the cell; primary tissue; connective tissue; skin; muscle; nervous tissue; blood; lymphoid tissues; respiration; blood vessels; circulation; cardiac cycle; systemic circulation; sensory receptors; special senses; motor unit; spinal cord; control of movement; hypothalamic functions; gastrointestinal tract; kidneys; uterus; urinary tract; pregnancy; endocrine system.

Practical classes include hematology experiments, clinical examinations, amphibian chart, and recommended demonstrations.

Subject	Title	Duration	Total	: PHYSIOLOGY
Hours	Theory	Practical		: 0 – 12 Months
				: 210
				: 150 Hrs
				: 60 Hrs
Total Hours / Week			Lecture	: 7 Hrs
			Practicals	: 4 Hours / Week
			Seminars / Tutorials	: 2 Hours / Week
				: 1 Hour / Week
Method of Assessment:				Written, Oral, Practical

SI No	TOPIC	TEACHING HOURS
1	<p>General Physiology</p> <p>Cell: Morphology. Organelles: their structure and functions</p> <p>Transport Mechanisms across the cell membrane</p> <p>Body fluids: Distribution, composition. Tissue fluid - formation.</p>	2 Hours
2	<p>Blood</p> <p>Introduction: Composition and functions of blood.</p> <p>Plasma: Composition, formation, functions. Plasma proteins. RBC: count and its variations. Erythropoiesis- stages, factors regulating. Reticulo-endothelial system (in brief) Haemoglobin - Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.</p> <p>WBC: Classification, Morphology, functions, count, its variation of each. Immunity</p> <p>Platelets: Morphology, functions, count, its variations</p> <p>Hemostatic mechanisms: Blood coagulation- factors, mechanism, related disorders. Anticoagulants.</p> <p>Blood Groups: Landsteiner's law. Types, significance, determination, Erythroblastosis foetalis.</p> <p>Blood Transfusion: Cross matching. Indications and complications. Lymph: Composition, formation, circulation and functions.</p>	10 Hours
3	<p>Nerve Muscle Physiology</p> <p>Introduction: Resting membrane potential. Action potential - ionic basis and properties.</p> <p>Nerve: Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibres. Nerve injury - degeneration and regeneration.</p> <p>Neuroglia: Types and functions.</p> <p>Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction : Structure. Neuromuscular transmission, myasthenia gravis. Excitation- Contraction coupling. Rigor mortis. Motor unit. Properties of skeletal muscles, Strength- Duration curve, Length-tension relationship, fatigue, load.</p> <p>Smooth muscle: Structure, types, mechanism of contraction. Plasticity.</p>	15 Hours

4	<p>Cardiovascular System</p> <p>Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.</p> <p>Conducting system: Components. Impulse conduction Cardiac Cycle: Definition. Phases of cardiac cycle. Pressure and volume curves. Heart sounds – causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.</p> <p>Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation. Their variations</p>	20 Hours
	<p>Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.</p> <p>Arterial pulse.</p> <p>Shock – Definition. Classification–causes and features Regional Circulation: Coronary, Cerebral and Cutaneous circulation. Cardiovascular changes during exercise.</p>	
5	<p>Respiratory System</p> <p>Introduction: Physiological anatomy – Pleura, tracheo- bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles. Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration. Chest expansion. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant – Composition, production, functions. RDS Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume.</p> <p>Dead Space: Types and their definition.</p> <p>Pulmonary Circulation. Ventilation-perfusion ratio and</p>	15 Hours

	<p>its importance.</p> <p>Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport – Different forms, oxygen- haemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, chloride shift.</p> <p>Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation.</p> <p>Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization</p> <p>Hypercapnoea. Asphyxia. Cyanosis – types and features. Dysbarism</p> <p>Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. periodic breathing – types</p> <p>Artificial respiration</p> <p>Respiratory changes during exercise.</p>	
6	<p>Digestive System</p> <p>Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system</p> <p>Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication (in brief) Swallowing: Definition. Different stages. Functions.</p> <p>Stomach: Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting.</p>	5 Hours
	<p>Pancreatic Secretion: Composition, production, function. Regulation.</p> <p>Liver: Functions of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions.</p> <p>Intestine: Succus entericus: Composition, function and regulation of secretion. Intestinal motility and its function and regulation.</p> <p>Mechanism of Defaecation.</p>	

7	<p>Renal System 3</p> <p>Introduction: Physiological anatomy. Nephrons – cortical and juxtamedullary. Juxta- glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.</p> <p>Mechanism of Urine Formation:Glomerular Filtration: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Renal clearance. Inulin clearance. Creatinine clearance.</p> <p>Tubular Reabsorption: Reabsorption of Na⁺, glucose, HCO⁻, urea and water. Filtered load. Renal tubular transport maximum. Glucose clearance: T_mG. Renal threshold for glucose. Tubular Secretion: Secretion of H⁺ and K⁺. PAH clearance.</p> <p>Mechanism of concentrating and diluting the Urine: Counter- current mechanism. Regulation of water excretion. Diuresis. Diuretics.</p> <p>Micturition: Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder. Acid-Base balance (very brief)</p> <p>Artificial Kidney: Principle of haemodialysis. Skin and temperature regulation.</p>	8 Hours
8	<p>Endocrine System</p> <p>Introduction: Major endocrine glands.</p> <p>Hormone: classification, mechanism of action.</p> <p>Functions of hormones Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone. Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus.</p> <p>Physiology of growth and development: hormonal and other influences.</p> <p>Pituitary-Hypothalamic Relationship.</p> <p>Thyroid Gland:Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxoedema, Cretinism, Grave's disease.</p>	10 Hours

	<p>Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism. Calcium metabolism and its regulation.</p> <p>Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol, Androgens. Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome. Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders:</p>	
	<p>Phoehromocytoma.</p> <p>Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.</p> <p>Calcitriol, Thymus and Pineal gland (very brief). Local Hormones. (briefly)</p>	
9	<p>Reproductive System</p> <p>Introduction: Physiological anatomy reproductive organs. Sex determination. Sex differentiation. Disorder</p> <p>Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion. Semen.</p> <p>Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis. Hormones: oestrogen and progesterone-action. regulation of secretion. Menstrual Cycle: Phases. Ovarian cycle. Uterine cycle. Hormonal basis. Menarche. Menopause. Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods</p>	5 Hours
11	<p>Special Senses</p> <p>Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and</p>	10 Hours

	<p>cones. Photopic vision. Scotopic vision.</p> <p>Visual Pathway and the effects of lesions.</p> <p>Refractive Errors: myopia, hypermetropia, presbyopia and astigmatism.</p> <p>Visual Reflexes: Accommodation, Pupillary and Light.</p> <p>Visual acuity and Visual field. Light adaptation. Dark adaptation. Color vision – color blindness. Nyctalopia.</p> <p>Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for hearing. Audiometry.</p> <p>Taste: Taste buds. Primary tastes. Gustatory pathway. Smell: Olfactory membrane. Olfactory pathway.</p> <p>Vestibular Apparatus: Crista ampullaris and macula. Functions. Disorders</p>	
12	<p>Nervous System</p> <p>Introduction: Organisation of CNS – central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties.</p> <p>Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts – Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract – their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereognosis, vibration</p>	20 Hours
	<p>sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain – slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain. Gate control theory of pain. tabes dorsalis, sensory ataxia.</p> <p>Motor Mechanism: Motor Cortex. Motor pathway: The descending tracts – pyramidal tracts, extrapyramidal tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron.</p>	

	<p>Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.</p> <p>Reflex Action: components, Bell-Magendie law, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes. Stretch reflex– structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL</p> <p>Spinal cord Lesions: Complete transection and Hemisection of the spinal cord. Cerebellum: Functions. Cerebellar ataxia.</p> <p>Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes. Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome Reticular Formation and Limbic System: Components and Functions. Basal Ganglia: Structures included and functions. Parkinson’s disease.</p> <p>Cerebral Cortex: Lobes. Brodmann’s areas and their functions. Higher functions of cerebral cortex – learning, memory and speech.</p> <p>EEG : Waves and features. Sleep: REM and NREM sleep. CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.</p> <p>ANS: Features and actions of parasympathetic and sympathetic nervous system.</p>	
13	<p>Physiology of Exercise</p> <p>A. Effects of acute and chronic exercise on</p> <p>O₂ transport</p> <p>2) Muscle strength/power/endurance 3) B.M.R./R.Q.</p> <p>Hormonal and metabolic effect</p> <p>Cardiovascular system</p> <p>Respiratory system</p>	15 Hours

	<p>Body fluids and electrolyte</p> <p>B. Effect of gravity / altitude /acceleration / pressure on physical parameters</p> <p>Physiology of Age</p>	
14	<p>Applied Physiology</p> <p>More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interest in Physiotherapy.</p> <p>a. Pulmonary Functions</p> <ol style="list-style-type: none"> 1.Properties of gases, Mechanics of respiration, of pulmonary circulation and their application. 2.Respiratory adjustments in exercises. 3.Artificial respiration 4.Breath sounds. <p>a.Cardio vascular Functions</p> <ol style="list-style-type: none"> 1.Blood flow through arteries, arterioles, capillaries, veins and venuoles. 2.Circulation of Lymph, Oedema 3.Factors affecting cardiac output. 4.Circulatory adjustment in exercise and in postural and gravitational changes, 5.Pathophysiology of fainting and heart failure. <p>b. Muscles and Nervous System Functions</p> <ol style="list-style-type: none"> 1.Peripheral nervous system, Neuromuscular transmission, Types of nerve fibres. 2.Action potential, Strength-duration curve, ECG, EMG, VEP, NCV 3.Degeneration and regeneration of nerve, Reactions of denervations. 4.Synaptic transmission, Stretch reflex- Mechanism and factors affecting it. 5.Posture, Balance and Equilibrium/Coordination of voluntary movement 6.Voluntary motor action, clonus, Rigidity, Discordination, 7.Special senses- Vision, taste, hearing, vestibular, Olfaction 	15 Hours

	8.Sympathetic and Parasympathetic regulation, Thermoregulation, c. Blood functions 1.Thalassemia Syndrome, Hemophilia, VWF 2.Anemia, Leucocytosis 3.Bone marrow transplant d. Metabolic Functions Diabetes Mellitus, Physiological basis of Peptic Ulcer, Jaundice, GIT disorders and Dietary fiber, Thyroid functions, Vitamins deficiency,	
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PRACTICALS (60 Hours)

SI No	TOPIC	HOURS
1	Haematology 1. Study of Microscope and its uses 2. Determination of RBC count 3. Determination of WBC count 4. Differential leukocyte count 5. Estimation of hemoglobin 6. Calculation of blood indices 7. Determination of blood groups 8. Determination of bleeding time 9. Determination of clotting time Demonstrations only 1. Determination of ESR 2. Determination of PCV	20 Hours
2	Clinical Examination 1. Examination of Radial pulse. 2. Recording of blood pressure 3. Examination of CVS 4. Examination of Respiratory system 5. Examination of Sensory system 6. Examination of Motor System 7. Examination of reflexes 8. Examination of cranial nerves	20 Hours
3	Amphibian Experiments – Demonstration and Dry charts Explanation Instruments used for frog experiments. Kymograph, heart liver, Muscle trough, stimulator. Simple muscle curve.	15 Hours

	Effect of increasing the strength of the stimuli Effect of temperature on muscle contraction. Effect of two successive stimuli. Effect of Fatigue. Effect of load on muscle contraction Genesis of tetanus and clonus. Velocity of impulse transmission. Normal cardiogram of amphibian heart. Properties of Cardiac muscle Effect of temperature on cardiogram.	
4	Recommended Demonstrations 1. Spirometry 2. Artificial Respiration 3. ECG 4. Perimetry 5. Mosso's Ergometry	5 Hours

Recommended text books:

1. Text book of medical physiology – Guyton Arthur
2. Concise medical physiology – Chaudhuri Sujit K.
3. Human Physiology – Chatterjee C.C.
4. Text book of practical Physiology – Ranade.
5. Text of Physiology – A.K.Jain.
6. Basics of Medical physiology- Venkatesh D & Sudhakar H H
7. Manipal Manual of Physiology – Prof. C N Chandrashekar

Reference:

8. Review of Medical Physiology – Ganong William F.
9. Physiological basis of Medical practice – Best & Taylor

3.3 BIOCHEMISTRY

Course description:

The Physiotherapy graduates should acquire adequate knowledge, necessary skills and such attitudes which are required for carrying out all the activities appropriate to general physiotherapy practice involving the prevention, diagnosis and treatment of diseases of the musculoskeletal and associated tissues. At the end of the course, the student should be able to: Make use of biochemical analysis relevant to clinical diagnosis, analyze and interpret investigative data, demonstrate the skills of solving scientific and clinical problems.

Subject Title Duration Total Hours Theory : BIOCHEMISTRY
Lecture : 0 – 12 Months
: 80
: 80 Hrs
: 3 Hours / Week

Method of Assessment : Written

THEORY

SI No	TOPIC	TEACHING HOURS
1	Introduction to Biochemistry and Scope of biochemistry in physiotherapy	1
2	Cell and Transport across cell membranes Cell Membrane - Fluid mosaic model, composition, Fluidity of membrane Cell organelles Transport across cell membranes with examples – Passive transport – Diffusion and facilitated transport (ion channels) Active transport – Primary & Secondary Endocytosis and Exocytosis	3
3	Chemistry of Carbohydrate Definition, Biomedical importance Classification with examples Monosaccharides – classification with examples Disaccharides, oligosaccharides – composition, importance Polysaccharides – classification, Homopolysaccharides – Composition and Structure of starch and glycogen Heteropolysaccharides – mucopolysaccharides (Composition, structure and function) Glycosides	3

4	<p>Chemistry of lipids Definition, Modified Bloor's classification with examples. Biomedical importance of lipids Fatty acids – nomenclature and different types of classification Essential Fatty acids - Definition, examples and importance, Mono and Polyunsaturated fatty acids, n3 and n6 fatty acids, Trans-fatty acids. Triglycerides – composition and importance Phospholipids- types, functions with clinical importance Glycolipids – Types and importance Amphipathic lipids - Definition, examples and importance Sources of dietary lipids</p>	3
5	<p>Chemistry of amino acids and Proteins Biologically important peptides Proteins – Definition, Classification based on - (a) Chemical nature & solubility (b) Functions of proteins (c) Nutritional value</p>	3
	<p>Structural organisation of proteins (primary, secondary, domains, tertiary and quaternary structures) Denaturation - definition, causes, properties of a denatured protein, significance Amino acids – Classification based on side chain properties, nutritional requirement and metabolic fate Structure function relationship of Proteins – Hemoglobin, Collagen</p>	
6	<p>Plasma proteins Definition, types & functions of plasma proteins Albumin – functions & clinical significance Globulins of clinical importance Acute phase proteins - Positive & Negative (functions & clinical significance) Reference range of important plasma proteins Electrophoretic patterns</p>	2
7	<p>Connective tissue Collagen, elastin - Structure and associated disorders Composition and function of Extracellular matrix – Proteins (structure and functions of Collagen, elastin etc) and Proteoglycans. Involvement of ECM components in musculoskeletal health and disease.</p>	3

8	Immunology Immunoglobulins – Structure, types & functions	1
9	Chemistry of Nucleic acids Nitrogenous bases, Nucleosides and Nucleotides - examples, Importance Structure and function of DNA (B-DNA) Types of RNA (hnRNA, mRNA, rRNA, tRNA, SnRNA) with structure and functions	2
10	Enzymes Enzymes- Definition, IUBMB Classification. Coenzymes and Cofactors Mechanism of Enzyme action - Concept of activation energy, active site; Substrate binding to active site - Koshlands Induced fit theory. Enzyme inhibition - Competitive and Non- competitive inhibition with examples of clinical importance Isoenzymes – Definition, Diagnostic Importance of isoenzymes of LDH,CK,ALP Diagnostic Importance of enzymes – LDH, CK, AST, ALT, ALP, GGT, Amylase, Lipase Factors affecting enzyme activity Outline of Enzyme regulation by- Short term (Covalent modification, Zymogen activation, Allosteric regulation, Feedback regulation) and long term regulation (Induction and repression) Enzyme specificity	6
11	Vitamins Definition, difference between water and fat soluble vitamins Fat soluble vitamins (A,D,E,K), Vitamin C, Folic acid, Vitamin B12 – RDA, Sources, Metabolism, Biochemical functions, Deficiency manifestations Water soluble vitamins (B1, B2, B3, B6) - Biochemical functions, Deficiency manifestations. Hypervitaminosis Antivitamins	6
12	Minerals Sources, RDA, Digestion and absorption, Homeostasis, Functions, Normal levels, Causes and features of hypo and hyper conditions of – Calcium, phosphorus, Iron Functions and disorders associated	4

	with - Copper, Zinc, Fluoride, Iodine, Magnesium and selenium.	
13	<p>Biological Oxidation</p> <p>High energy compounds</p> <p>Electron Transport Chain – Organization, components, flow of electrons.</p> <p>Oxidative Phosphorylation – Sites, mechanism (Chemiosmotic hypothesis).</p> <p>Inhibitors of Electron Transport Chain, oxidative phosphorylation, Uncouplers</p>	2
14	<p>Carbohydrate metabolism</p> <p>Digestion and absorption and associated disorders</p> <p>Glucose transporters</p> <p>PATHWAYS – Site, reactions, key steps, significance, energetics and regulation of -</p> <p>□ Glycolysis □ TCA cycle □ Gluconeogenesis □</p> <p>Glycogenesis □ Glycogenolysis</p> <p>Amphibolic role of Citric acid cycle Cori's cycle</p> <p>Regulation of blood glucose levels in well fed condition and fasting.</p> <p>Metabolic changes during well fed condition and starvation Glycogen storage disorders, Diabetes Mellitus- metabolic alterations, diagnostic criteria.</p> <p>Significance of HMP shunt pathway, uronic acid pathway</p>	7
15	<p>Lipid metabolism Digestion and Absorption and associated disorders.</p> <p>Pathways – Site, reactions, key steps, significance, energetics and regulation of</p> <p>Beta oxidation of fatty acids Ketogenesis, ketolysis, ketoacidosis Lipogenesis, TG synthesis and breakdown.</p> <p>Fat metabolism in adipose tissue</p> <p>Cholesterol – structure and functions, outline of synthesis.</p> <p>Lipoprotein metabolism -Structure, Composition, Types, Functions</p> <p>Fatty liver and lipotropic factors Atherosclerosis, coronary heart disease(CHD), dyslipidemia</p> <p>Role of LDL in atherosclerosis</p> <p>Prostaglandins – types and biomedical importance</p>	5
16	<p>Protein and amino acid metabolism</p> <p>Digestion and absorption and associated disorders</p>	4

	<p>General reactions – Transamination, Deamination – Oxidative & non oxidative and their significance.</p> <p>Ammonia metabolism Urea cycle and its disorders</p> <p>Aminoacid metabolism</p> <p>Specialised products formed from Glycine, phenyl alanine, tyrosine, tryptophan, methionine, arginine and their importance</p>	
17	<p>Molecular Biology</p> <p>Genetic Code and its characteristics</p> <p>Mutations - causes, types, Consequences with examples</p> <p>Outline of DNA replication, Transcription, Translation.</p>	2
18	<p>Nutrition and dietics</p> <p>BMR – Definition, Normal values, Factors affecting and biomedical importance</p> <p>SDA – Definition and its significance Nitrogen balance</p> <p>Calculation of energy requirement of a person</p> <p>Physical activities –energy expenditure for various activities</p> <p>Balanced diet – definition, composition</p> <p>Nutritional importance of Carbohydrates, Lipids ,Proteins, Nutritional indices</p> <p>Recommended dietary allowance(RDA)</p> <p>Dietary fibres – definition, examples, functions</p> <p>Biochemical and clinical features of PEM-Kwashiorkor and Marasmus</p> <p>Obesity – Definition, BMI, types, causes, role of GI peptides and adipokines in obesity</p> <p>Nutritional indices</p> <p>Glycemic index – definition, calculation, importance</p>	6
19	<p>Tissue Biochemistry</p> <p>Heme metabolism –</p> <p>Types of Hemoglobins</p> <p>Bilirubin metabolism and jaundice</p> <p>Muscle tissue–</p> <p>Muscle proteins, role of calcium and ATP in muscle contraction, sliding filament theory, cross bridge cycle.</p> <p>Bone tissue–</p> <p>Concept of Bone turnover, factors affecting bone turnover, Peak bone mass, List of markers of bone formation and bone resorption</p>	4
20	Water and electrolyte balance	2

	<p>Distribution of water and electrolytes in ICF and ECF</p> <p>Osmolality of ECF</p> <p>Regulation of water and electrolyte balance – RAS mechanism</p> <p>Electrolyte imbalance</p>	
21	<p>Acid base balance</p> <p>Concept of Acids, Bases and buffers</p> <p>Regulation of pH of blood by buffers, respiratory and renal mechanisms</p> <p>Acidosis and alkalosis (metabolic and respiratory) – causes, compensatory mechanisms and lab findings</p> <p>HH Equation and its application</p>	2
22	<p>Hormone action Definition, Classification</p> <p>Second messengers</p> <p>Mechanism of action of Group I and Group II hormones, Receptors, signal transduction, second messengers</p>	2
23	<p>Free Radicals and Antioxidants</p> <p>Free radicals and Reactive oxygen species (ROS)</p> <p>Damaging effects of ROS on biomolecules, lipid peroxidation</p> <p>Anti-oxidant defence systems in our body</p> <p>Oxidative stress – role in cancer, complications of diabetes, atherosclerosis.</p>	2
24	<p>Detoxification</p> <p>Definition-Xenobiotics, Biotransformation</p> <p>Phase –I reactions Oxidation, Hydroxylation (Cytochrome P450)</p> <p>Phase-II reactions</p> <p>Conjugation reactions-Glucuronic acid, Glutathione, Glycine</p>	1
25	<p>Clinical Biochemistry</p> <p>Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, glycated haemoglobin, Urea, Uric acid, Creatinine, Calcium, Phosphates, electrolytes, lipid profile, pH and Bicarbonate</p> <p>Liver function tests</p> <p>Renal function tests</p>	4

RECOMMENDED TEXT BOOKS (recent editions)

1. Rafi MD (3rd edition). Textbook of Biochemistry
2. DM Vasudevan. Textbook of Biochemistry
3. U Satyanarayana. Biochemistry
4. S.K.Gupta. Biochemistry

REFERENCE BOOKS: (Recent editions)

1. Lippincotts' Illustrated reviews – Biochemistry
2. Harpers' Illustrated Biochemistry
3. Tietz. Clinical Chemistry
4. Stryer. Biochemistry

3.4 HUMAN BIOMECHANICS

Course Description

Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of Musculoskeletal system. Students are taught to understand the various quantitative methods of movement. Mechanical principles of various treatment methods are studied. Study of posture and gait are also included.

Subject Title Duration Total Hours : BIOMECHANICS
 Theory Practical : 0 – 12 Months
 : 225
 : 125 Hours
 : 100 Hours

Total Hours / Week Lecture : 6 Hrs
 Practicals : 3 Hours / Week
 Seminars / Tutorials : 2 Hours / Week
 : 1 Hour / Week

Method of Assessment : Written, Oral, Practical

SI No	TOPIC	TEACHING HOURS
1	Basic Concepts in Biomechanics: Kinematics and Kinetics a) Types of Motion b) Location of Motion c) Direction of Motion d) Magnitude of Motion e) Definition of Forces f) Force of Gravity g) Reaction forces h) Equilibrium i) Objects in Motion j) Force of friction k) Concurrent force systems l) Parallel force systems m) Levers n) Pulleys o) Work p) Moment arm of force q) Force components r) Equilibrium of levers	7 Hours
2	Joint structure and Function a) Joint design b) Materials used in human joints c) General properties of connective tissues d) Joint function e) Joint motion	7 Hours

3	Muscle structure and function a) Mobility and stability functions of muscles b) Elements of muscle structure c) Muscle function	7 Hours
4	Biomechanics of the Thorax and Chest wall a) Mobility and stability functions of muscles b) Elements of muscle structure c) Muscle function	5 Hours
5	The Temporo-mandibular Joint a) General features, structure and function	2 Hours
6	Biomechanics of the vertebral column a) General structure and function b) Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region c) Muscles of the vertebral column d) Ligaments of Vertebral Column	8 Hours
7	Biomechanics of the peripheral joints (to include kinetics and kinematics) a) The shoulder complex: Structure and components of the shoulder complex and their integrated function b) The elbow complex: Structure and function of the elbow joint – humeroulnar and humeroradial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex. c) The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; prehension; functional position of the the wrist and hand. d) The hip complex: structure and function of the hip joint. e) The knee complex: structure and function of the knee joint – tibiofemoral joint and patellofemoral joint. f) The ankle and foot complex.: structure and function of the ankle joint, subtalar joint, talocalcaneonavicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and foot.	72 Hours
8	Analysis of Posture and Gait a) Static and dynamic posture, postural control, kinetics and kinematics of posture, ideal posture analysis of posture, b) General features of gait, gait initiation, kinematics and kinetics of gait, energy requirements, kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running.	10 Hours

9	<p>Movement Analysis ADL activities like sitting – to standing, lifting, various grips , pinches.</p>	3 Hours
10	<p>Goniometry Parts, types, principles and uses of a goniometry. Techniques for measurement of ROM of all peripheral joints.</p>	2 Hours
11	<p>Therapeutic Gymnasium</p> <p>a. Equipments and tools with their uses and therapeutic application</p> <p>Springs: properties, springs in series and parallel</p> <p>Pulleys: properties, types, mechanical advantage</p> <p>Resistance devices: types, weights, different tools used to apply resistance</p> <p>Elastic tools: elasticity, recoil, extensibility</p> <p>Explanation and mechanical principles of various equipments in an ideal gymnasium: parallel bars, wall bars, springs, pulleys, suspension unit, CPM unit, cervical and lumbar traction, shoulder wheel, overhead pulley systems, quadriceps table, DeLormes“ shoe, weights, therabands, shoulder ladder, tilt table, equilibrium board, wobble board, treadmill, bicycle ergometer, medicine balls, gym ball, plinth, staircase, re-education board, bolster, wedges</p> <p>Walking aids and crutches: types and uses</p> <p>Hydrotherapy unit (in brief)</p> <p>b. Walking Aids: Parallel bars, crutches, canes, walkers – types, parts and uses. The following topics are part of applied Biomechanics and are required to be taught but not for examination.</p> <p>General effects of disease, injury and immobilization.</p> <p>Effects of immobilization, injury and aging</p> <p>Changes in normal structure and function I relation to pregnancy, scoliosis and COPD</p> <p>Effects of posture on age, pregnancy, occupation and recreation;</p>	2 Hours

PRACTICAL: [100 Hours] shall be conducted for various joint movements and analysis of the same. Demonstration may also be given as how to analyze posture and gait. The demonstrations may be done on models or skeleton.

The student shall be taught and demonstrated to analysis for activities of daily living – ADL – (like sitting to standing, throwing, lifting etc.) The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur.

- Measurement of Joint ROM using goniometer.
- Identification of walking aids with their uses
- Identification of the various tools and equipments in therapeutic gymnasium with their uses

Recommended Text books:

1. Levangie PK, Norkins CC: Joint Structure and Function: A Comprehensive Analysis. Jaypee Brothers Medical Publishers, New Delhi
2. Smith, Weiss, Lehmkuhl: Brunnstrom's Clinical Kinesiology., Jaypee Brothers, New Delhi,
3. Hollis M, Cook PF: Practical Exercise Therapy., Blackwell, Oxford
4. Gardiner DM: Principles of Exercise Therapy. CBS Publishers, New Delhi
5. Lippert LS: Clinical Kinesiology for Physical Therapy Assistants. Jaypee Brothers, New Delhi
6. Jones and Barker: Human Movement Explained. Butterworth- Heine, London
7. Norkin C, White JD: Measurement of Joint Motion: A Guide to Goniometry. Jaypee Brothers, Daryaganj.
8. Kisner C, Kolby LA: Therapeutic Exercise Foundation and Technique. Jaypee Brothers, New Delhi,
9. Champion MR: Hydrotherapy: Principles and Practice, Butterworth, Oxford.
10. Palastanga N, Field D, Soames R: Anatomy and Human movement – Structure & Function. Elsevier LTd, Philadelphia, USA.

3.5 PSYCHOLOGY & SOCIOLOGY

Course description

Human Psychology involves the study of various behavioral patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups. Sociology will introduce student to the basic sociology concepts, principles and social process, social institutions [in relation to the individual, family and community] and the various social factors affecting the family in rural and urban communities in India will be studied.

The study of these subjects will help the student to understand their clients while assessment and while planning appropriate treatment methods.

PSYCHOLOGY

Subject Title Duration Total Hours Theory Lecture	: PSYCHOLOGY : 0 – 12 Months : 60 : 60 Hrs : 2 Hours / Week
Method of Assessment	: Written

SI No	TOPIC	TEACHING HOURS
1	Introduction to Psychology Schools: Structuralism, functionalism, behaviorism, Psychoanalysis. Methods: Introspection, observation, inventory and experimental method. Branches: pure psychology and applied psychology Psychology and physiotherapy	6 Hours
2	Growth and Development a) Life span: different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age). b) Heredity and environment: role of heredity and	6 hours

	environment in physical and psychological development, –Nature v/s Nurture controversy	
3	<p>Motivation</p> <p>a) Motivation cycle (need, drive, incentive, reward).</p> <p>b) Classification of motives.</p> <p>c) Abraham Maslow’s theory of need hierarchy</p>	4 Hours
4	<p>Sensation, attention and perception</p> <p>a. Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense</p> <p>b. Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants)</p> <p>c. Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context)</p> <p>d. Illusion and hallucination: different types</p>	6 Hours
5	<p>Emotions</p> <p>a) Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).</p>	6 Hours
	<p>b. Theories of emotion</p> <p>c. Stress and management of stress.</p>	
6	<p>Frustration and conflict</p> <p>a. Frustration: sources of frustration.</p> <p>b. Conflict: types of conflict.</p> <p>c. Management of frustration and conflict</p>	2 Hours
7	<p>Thinking</p> <p>a. Reasoning : deductive and inductive reasoning</p> <p>b. Problem solving: rules in problem solving (algorithm and heuristic)</p> <p>c. Creative thinking: steps in creative thinking, traits of creative people</p>	4 Hours
8	<p>Intelligence</p> <p>a. Theories of intelligence.</p> <p>b. Distribution of intelligence.</p> <p>c. Assessment of intelligence</p>	6 Hours

9	<p>Learning</p> <ol style="list-style-type: none"> a. Factors effecting learning. b. Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory c. The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods. 	8 Hours
10	<p>Personality</p> <ol style="list-style-type: none"> a. Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach. b. Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques. c. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out. 	8 Hours
11	<p>Social psychology</p> <ol style="list-style-type: none"> a. Leadership: Different types of leaders. Different theoretical approaches to leadership. b. Attitude: development of attitude. Change of attitude 	4 Hours

Recommended text books:

1. Feldman.R.H(1996). Understanding Psychology. New Delhi: Tata McGraw hill.
2. Morgan et al(2003). Introduction to Psychology. New Delhi: Tata McGraw hill.
3. Lefton(). Psychology. Boston: Alwin & Bacot Company.
4. Mangal, S.K (2002). Advanced Educational Psychology. New Delhi: prentice hall.
5. Atkinson(1996). Dictionary of Psychology.

Sociology

SI No	TOPIC	TEACHING HOURS
1	Introduction 1) Meaning – Definition and Scope of Sociology. History of Sociology as a Social Science. 2) Its relation to Anthropology, Psychology and other Social Sciences. 3) Methods of Sociological investigations – Case Study Method, Social Survey Method, Questionnaire Method, Interview Method, Opinion Poll Method etc. 4) Importance of its study with special reference to Healthcare Professionals.	4 Hours
2	Social Factors in Health Disease Situations 1) Meaning of Social Factors. 2) Role of Social Factors in Health and Illness.	4 Hours
3	Socialization 1) Meaning and Nature of Socialisation 2) Primary, Secondary and Anticipatory Socialisation. 3) Agencies of Socialisation.	4 Hours
4	Social Groups Concepts of Social groups, influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in Hospital and Rehabilitation Setup.	5 Hours
5	Family 1) The Family, meaning and definitions. 2) Functions of types of family. 3) Changing family patterns. 4) Influence of Family on the individual's health, family and nutrition, the effects of sickness in the family and psychosomatic disorders and their importance to physiotherapy.	6 Hours
6	Community 1) Rural Community: Meaning, definitions and features. Health hazards of ruralites, health hazards of tribals. 2) Urban Community: Meaning, definitions and features. Health hazards of urbanites.	4 Hours

7	Culture and Health 1) Concept of Health 2) Concept of Culture 3) Culture and Health Culture and Health disorders	6 Hours
8	Social Change 1) Meaning of Social Change 2) Factors of Social Change 3) Human Adaptation and Social Change 4) Social Change and Stress 5) Social Change and Deviance 6) Social Change and Health Programmes. 7) The role of Social Planning in the improvement of Health and Rehabilitation.	8 Hours
9	Social Problems of the Disabled The consequences of the following social problems in relation to sickness and disability. Preventive methods and remedies to these social problems. 1) Population Explosion 2) Poverty and Unemployment 3) Beggary 4) Juvenile Delinquency 5) Prostitution 6) Alcoholism 7) Problems of women in employment 8) Geriatric Problems 9) Problems of Underprivileged	10 Hours
10	Social Security Social Security and Social Legislation in relation to the disabled.	5 Hours
11	Social Worker 1) Social Work: Meaning, definitions, scope, features 2) The Role of a Social Worker The Role of a Medical Social Worker	4 Hours

Recommended Text Books:-

1. Sachdeva and Vidyabushan, Introduction to the study of sociology
2. INDRANI T K, Text Books of Sociology for Graduates Nurses and Physiotherapy Students, JP Brothers, New Delhi,10

Subsidiary subjects: Not for University Examination**3.6 ENGLISH****(60 Hours)**

Sl No	TOPIC	TEACHING HOURS
1	Behavioural Objectives: The student at the end of training is able to 1. Read and comprehend English language 2. Speak and write grammatically correct English 3. Appreciates the value of English literature in personal and professional life,	8 Hours
2	Unit -I : Introduction: Study Techniques Organisation of effective note taking and logical processes of analysis and synthesis The use of the dictionary Enlargement of vocabulary Effective diction	8 Hours
3	Unit - II: Applied Grammar: Correct usage The structure of sentences. The structure of paragraphs Enlargements of Vocabulary	9 Hours
4	Unit - III: Written Composition: Precise writing and summarising Writing of bibliography Enlargement of Vocabulary	9 Hours
5	Unit - IV Reading and comprehension Review of selected materials and express oneself in one's words. Enlargement of Vocabulary.	8 Hours
6	Unit - V The Study of Various Forms of Composition Paragraph, Essay, Letter, Summary, Practice in writing	9 Hours
7	Unit - VI Verbal Communication: Discussions and Summarization, Debates, Oral reports, use in teaching	9 Hours

Reference

1. English Grammar Collins, Birmingham University, International Language Data Base, Rupa & Co. 1993
2. Wren and Martin - Grammar and Composition, 1989, Chanda.& Co, Delhi
3. 3.Letters for all Occassions A S Myers. Pub - Harper Perennial
4. 4.Spoken English V Shasikumar and P V Dhanija_ Pub. By: Tata Mcgraw Hill, New Delhi
5. 5.Journalism Made Simple , D Wainwright
6. 6.Writers Basic Bookshelf Series, Writers Digest series
7. 7.Interviewing by Joan Clayton Platkon
8. 8.Penguin Book of Interviews.

3.7 KANNADA (50 HOURS)

ಕನ್ನಡ : ಒಂದು ಪಠ್ಯಕ್ರಮದ ರೂಪರೇಖೆ

- ಸ್ಥಾನ : ಬೇಸಿಕ್ ಬಿ.ಎಸ್ಸಿ., (ನರ್ಸಿಂಗ್) ಮೊದಲ ವರ್ಷ
ಸಮಯ : 15 ಘಂಟೆಗಳು (ಹದಿನೈದು ಘಂಟೆಗಳು)
ಪಠ್ಯಕ್ರಮದ : ವಿದ್ಯಾರ್ಥಿ/ವಿದ್ಯಾರ್ಥಿನಿರೂಪರು ದಿನನಿತ್ಯ ಸಂಪರ್ಕಿಸಬಹುದಾದ
ಜನಸಾಮಾನ್ಯರೊಡನೆ ಶುಶ್ರೂಷೆಗೆ ಸಂಬಂಧಿಸಿದಂತೆ ಕನ್ನಡದಲ್ಲಿ
ಸಂಭಾಷಣೆ ಮಾಡಲು ಹಾಗೂ ತಿಳುವಳಿಕೆ ನೀಡಲು ಸಹಕಾರ
ವಾಗುವಂತೆ ಪಠ್ಯಕ್ರಮದ ಮಾದರಿಯನ್ನು ಅಳವಡಿಸುವುದು.
ಉದ್ದೇಶ : 1. ದಿನ ಬಳಕೆಯ ವ್ಯವಹಾರದಲ್ಲಿ ಶುಶ್ರೂಷೆಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಕನ್ನಡ ಭಾಷೆಗೆ
ಅಳವಡಿಕೆ
2. ಕನ್ನಡೇತರರಿಗೆ ಕನ್ನಡ ಭಾಷೆಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

ಪಠ್ಯಕ್ರಮದ ವಿವರ

- ಘಟಕ ಒಂದು : (ಅ) ಅಕ್ಷರಮಾಲೆ, ಸ್ವರಗಳು, ವ್ಯಂಜನಗಳು
(ಆ) ಪದ, ಪದಪುಂಜ, ವಾಕ್ಯ ರಚನೆ, ಪತ್ರಲೇಖನ ಪ್ರಬಂಧರಚನೆ
ಎರಡು : ಶುಶ್ರೂಷಾ ಪದಗಳು (ಇಂಗ್ಲೀಷಿನಿಂದ ಕನ್ನಡಕ್ಕೆ
ಶುಶ್ರೂಷೆಯಲ್ಲಿ ಸಾಮಾನ್ಯ ಬಳಕೆಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ)
ಮೂರು : ರೋಗಿ ಹಾಗೂ ಶುಶ್ರೂಷಕರ ಮಧ್ಯೆ ಸಾಮಾನ್ಯವಾಗಿ ನಡೆಯುವ ಸಂಭಾಷಣೆ
(ಅ) ಪ್ರಶ್ನಾರ್ಥಕ ಸಲಹೆ ಕೊಡುವ ವಾಕ್ಯಗಳು
(ಆ) ವೈದ್ಯರೊಂದಿಗೆ ಹಾಗೂ ಇತರೆ ಸಹಚರರೊಂದಿಗೆ ವ್ಯವಹರಿಸಲು,
ಸಂಭಾಷಣೆ ನಡೆಸಲು ಬೇಕಾದ ವಾಕ್ಯಗಳು.

ಅಧ್ಯಯನಕ್ಕೆ ಶಿಫಾರಸ್ಸು ಮಾಡಲಾಗಿರುವ ಗ್ರಂಥಗಳು

1. ಕನ್ನಡ ವ್ಯಾಕರಣ (8. 9 ಮತ್ತು 10ನೇ ತರಗತಿಗಳಿಗೆ ಕರ್ನಾಟಕ ಸರ್ಕಾರ, ಪಠ್ಯಪುಸ್ತಕಗಳಇಲಾಖೆ)
2. ವ್ಯವಹಾರಿಕ ಕನ್ನಡ : ಎಚ್ಚೆಸ್ಸೆ
3. ಪತ್ರ ಲೇಖನ : ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್ತು
4. ಲೇಖನ ಕಲೆ : ಎನ್. ಪ್ರಹ್ಲಾದ್‌ರಾವ್
5. ಆರೋಗ್ಯ ಮತ್ತು ಇತರೆ ಪ್ರಬಂಧಗಳು : ಡಾ|| ಪಿ. ಎನ್. ಶಂಕರ್
6. ವೈದ್ಯ ಪದಗಳ ಹುಟ್ಟು ರಚನೆ : ಡಾ|| ಡಿ.ಎನ್. ಶಿವಪ್ಪ

**ಕನ್ನಡ : ಎರಡು
ಪಠ್ಯಕ್ರಮದ ರೂಪರೇಖೆ**

- ಸ್ಥಾನ : ಬೇಸಿಕ್ ಬಿ.ಎಸ್ಸಿ. (ನರ್ಸಿಂಗ್) ಮೊದಲ ವರ್ಷ
 ಸಮಯ : 15 ಘಂಟೆಗಳು (ಹದಿನೈದು ಘಂಟೆಗಳು)
 ಉದ್ದೇಶ : ಜನಾರೋಗ್ಯದ ಬಗ್ಗೆ ಜನಸಮುದಾಯಕ್ಕೆ ತಿಳುವಳಿಕೆ ಕೊಡುವುದು.

ಪಠ್ಯಕ್ರಮದ ವಿವರ

- ಘಟಕ ಒಂದು : ಜನಾರೋಗ್ಯದ ಶುಶ್ರೂಷೆಯಲ್ಲಿ ಸಂದೇಶಗಳು ವ್ಯವಸ್ಥೆ ಸಂದರ್ಶನ ಮಹತ್ವ ಸಂದರ್ಶನದ ಗುಣಗಳು.
 ಅನುಸರಿಸಬೇಕಾದ ನಿಯಮಗಳು
 ಅವ್ಯಾ ಮಾಹಿತಿಗಳ ಸಂಗ್ರಹ, ಸಂದೇಹಗಳು (ಶಂಕೆಗಳು)
 ಕುಟುಂಬ ಸಂಪರ್ಕ, ಸಂದರ್ಶಕ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ ಬಳಕೆ
- ಎರಡು : ವೈಯಕ್ತಿಕ ಆರೋಗ್ಯ
 ಮೂರು : ನೈಸರ್ಗಿಕ ನೈರ್ಮಲ್ಯ
 ನಾಲ್ಕು : ಸಾಂಕ್ರಾಮಿಕ ರೋಗಗಳು ಮತ್ತು ಅವುಗಳ ತಡೆಗಟ್ಟುವಿಕೆ
 ಐದು : ಆಹಾರ ಮತ್ತು ಆರೋಗ್ಯ
 ಆರು : ಶಾಯಿ ಮತ್ತು ಮಗುವಿನ ಆರೋಗ್ಯ
 ಏಳು : ಕುಟುಂಬ ಕಲ್ಯಾಣ ಯೋಜನೆ

ಅಧ್ಯಯನಕ್ಕೆ ಶಿಫಾರಸ್ಸು ಮಾಡಲಾಗಿರುವ ಗ್ರಂಥಗಳು

1. ಸಮಾಜ ಆರೋಗ್ಯ : ಡಾ|| ಎಸ್. ಎ. ನಾರಾಯಣ್
2. ಶಾಯಿ ಮಗು : ಡಾ|| ಅನುಪಮ ನಿರಂಜನ್
3. ರೋಗೋಪಚಾರ : ಡಾ|| ಎಸ್. ಆರ್. ಕಾವಳಿ
 (ಸೆಂಟ್‌ಜಾನ್ ಅಂಬುಲೆನ್ಸ್ ಅಸೋಸಿಯೇಷನ್)
4. ಪರಿಸರ ಸಂದರ್ಶನ
5. ಪರಿಸರ ಮಲಿನತೆ : ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಪರಿಷತ್ತಿನ ಪ್ರಕಟಣೆಗಳು
6. ಆರೋಗ್ಯ ಶಿಕ್ಷಣ ಮತ್ತು ಶಾಲಾ ಮಕ್ಕಳ ಆರೋಗ್ಯ (ಆರೋಗ್ಯ ಮತ್ತು ಕುಟುಂಬ ಯೋಜನೆ ಇಲಾಖೆ, ಬೆಂಗಳೂರು ಪ್ರಕಟಗೊಳಿಸಿರುವ ಪ್ರಸ್ತುತ ಪುಸ್ತಕಗಳು)

3.8 Communication & Soft Skills (10 Hours)

1. Basic concepts & principles of good communication
2. Special characteristics of health communication
3. Types & process of communication – verbal, non-verbal and written communication. Upward, downward and lateral communication.
4. Therapeutic communication: empathy versus sympathy.
5. Communication methods for teaching and learning.
6. Communication methods for patient education.
7. Barriers of communication & how to overcome.

Recommended books:

1. Personality Development & Soft skill- Barun K. Mitra
2. Essentials of Patient Education- Susan B. Bastable

3.9 BASIC NURSING & FIRST AID

THEORY

1 Hour per week

30 hours (Theory-20 & Practical- 10)

1. What is Nursing? Nursing principles. Inter-Personnel relationships. Bandaging : Basic turns; Bandaging extremities; Triangular Bandages and their application.
2. Nursing Position: Environment safety; Bed making, prone, lateral, dorsal, dorsal recumbent, Flower's positions, comfort measures, Aids and rest and sleep.
3. Lifting and Transporting Patients: Lifting Patients up in the bed. Transferring from bed to wheel chair. "Transferring from bed to stretcher".
4. Bed side Management: Giving and taking Bed pan, Urinal : Observation of stools, urine. Observation of sputum, understand use and care of catheters, enema giving.
5. Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion
6. Care of Rubber Goods: Observation, Reporting and Recording Temperature, Respiration and Pulse, Simple aseptic Technique, Sterilisation and Disinfection.
7. Surgical Dressing : Observation of dressing procedures

References:

1. Fundamentals of Nursing – A procedure manual -The trained Nurses Association
2. Fundamentals of Nursing- Patricia A Potter
3. First Aid & emergency- Ajay Singh
4. First Aid & Personal Hygiene- S S Randhawa
5. Fundamentals of Nursing- B T Basavantappa

3.10 Clinical Education and Orientation to Physiotherapy

THEORY

2 Hours per week 90 Hours

- I. Patterns of Health Care Delivery:
 - a) National Trends and resources
 - b) Local trends and resources
 - c) Overview of Health Science Professions
- II. Components of Physiotherapy Profession:
 - a) History of Medical Therapeutics
 - b) History of Physiotherapy
 - c) Overview of Health Science Professions
- III. Role of Physiotherapy in meeting Health Care Needs in India.
 - a) Needs versus Demands
 - b) Physiotherapist as 'Educator' c. Typical Job settings
 - c) Common problems and solutions

Integrated seminar & Problem Based learning sessions

3 Hours per week 80 Hours



SDM College of Medical Sciences & Hospital



SDM College of Dental Sciences & Hospital



SDM College of Physiotherapy &
SDM Institute of Nursing Sciences



Shri Dharmasthala Manjunatheshwara University



SDM Research Institute for Biomedical Sciences



Panoramic View of Campus