
REVA UNIVERSITY
Bengaluru, India

# (School of Allied Health Sciences)

# Bachelor of Physiotherapy

# HANDBOOK

# 2023 - 2027

Rukmini Knowledge Park
Kattigenahalli, Yelahanka, Bengaluru – 560064
Phone No: +91-080-46966966, Fax: 080-28478539
www.reva.edu.in

# SCHOOL OF ALLIED HEALTH SCIENCES

## Bachelor of Physiotherapy (BPT)

## Hand Book

## 2023 – 2027

Rukmini Knowledge Park,
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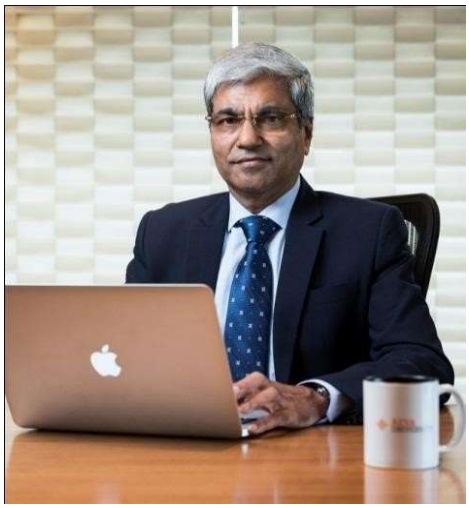
Rukmini Educational
Charitable Trust

www.reva.edu.in

# Chancellor's Message

*"Education is the most powerful weapon which you can use to change the world."*

- Nelson Mandela



There was a time when survival depended on just the realization of physiological needs. We are indeed privileged to exist in a time when intellectual gratification' has become indispensable. Information is easily attainable for the soul that is curious enough to go look for it. Technological boons enable information availability anywhere anytime. The difference, however, lies between those who look for information and those who look for knowledge.

It is deemed virtuous to serve seekers of knowledge and as educators it is in the ethos at REVA University to empower every learner who chooses to enter our portals. Driven by our founding philosophy of 'Knowledge is Power', we believe in building a community of perpetual learners by enabling them to look beyond their abilities and achieve what they assumed impossible.

India has always been beheld as a brewing pot of unbelievable talent, acute intellect and immense potential. All it takes to turn those qualities into power is a spark of opportunity. Being at a University is an exciting and rewarding experience with opportunities to nurture abilities, challenge cognizance and gain competence.

For any University, the structure of excellence lies in the transitional abilities of its faculty and its facility. I'm always in awe of the efforts that our academic board puts in to develop the team of subject matter experts at REVA. My faculty colleagues understand our core vision of empowering our future generation to be ethically, morally and intellectually elite. They practice the art of teaching with a student-centered and transformational approach. The excellent infrastructure at the University, both educational and extra-curricular, magnificently demonstrates the importance of ambience in facilitating focused learning for our students.

A famous British politician and author from the 19th century - Benjamin Disraeli, once said 'A University should be a place of light, of liberty and of learning'. Centuries later this dictum still inspires me and I believe, it takes team-work to build successful institutions. I welcome you to REVA University to join hands in laying the foundation of your future with values, wisdom and knowledge

**Dr. P. Shyama Raju**
The Founder and Hon'ble Chancellor, REVA University

# Pro-Chancellor's Message

The pursuit of academic excellence has been the cornerstone of REVA University. We are dedicated to establishing an educational institution that goes above and beyond conventional learning, revolutionising the field of education using cutting-edge techniques. We intend to create an environment that moulds students into holistic beings. By doing this, we continue to be the torchbearers of education by improving our position to be a Social Impact University and bringing about positive changes in our overall development.

For REVA, the year 2023 has been an eventful one. We are ranked among the top 100 Universities in NIRF Innovation ranking. We have also entered Times World University Higher Education Rankings in 2023 in the first attempt. We started several new courses that match industry standards and education trends. We began programmes like B.Sc Sports Science, B. Tech Agriculture Engineering, and B.Tech Aerospace Engineering that are in alignment with the trends.

REVA offers a setting where extracurricular endeavours and academic proficiency go hand in hand, relentlessly pursuing a path of greatness in every field. We balance the two by offering top-notch facilities and meticulously planned learning environments. At REVA, we have integrated technology in the most transparent manner with cutting-edge labs, an expansive central library, a fully-equipped fitness centre, a cutting-edge sports facility, and designated areas for extracurricular activities.

At REVA, we always value the commitment and dedication of our faculty and staff. They empower, support and guide students to strengthen their skills, generate confidence and help them soar high in their chosen fields.

Best wishes,

**Mr. Umesh S Raju**

Pro Chancellor, REVA University

# Vice-Chancellor's Message

The last two decades have seen a remarkable growth in higher education in India and across the globe. The move towards inter- disciplinary studies and interactive learning have opened up several options as well as created multiple challenges. India is at a juncture where a huge population of young crowd is opting for higher education. With the tremendous growth of privatization of education in India, the major focus is on creating a platform for quality in knowledge enhancement and bridging the gap between academia and industry.

A strong believer and practitioner of the dictum "Knowledge is Power", REVA University has been on the path of delivering quality education by developing the young human resources on the foundation of ethical and moral values, while boosting their leadership qualities, research culture and innovative skills. Built on a sprawling 45 acres of green campus, this 'temple of learning' has excellent and state-of-the- art infrastructure facilities conducive to higher teaching-learning environment and research. The main objective of the University is to provide higher education of global standards and hence, all the programs are designed to meet international standards. Highly experienced and qualified faculty members, continuously engaged in the maintenance and enhancement of student-centric learning environment through innovative pedagogy, form the backbone of the University.

All the programs offered by REVA University follow the Choice Based Credit System (CBCS) with Outcome Based Approach. The flexibility in the curriculum has been designed with industry-specific goals in mind and the educator enjoys complete freedom to appropriate the syllabus by incorporating the latest knowledge and stimulating the creative minds of the students. Bench marked with the course of studies of various institutions of repute, our curriculum is extremely contemporary and is a culmination of efforts of great think-tanks-a large number of faculty members, experts from industries and research level organizations. The evaluation mechanism employs continuous assessment with grade point averages. We believe sincerely that it will meet the aspirations of all stakeholders – students, parents and the employers of the graduates and post graduates of REVA University.

At REVA University, research, consultancy and innovation are regarded as our pillars of success. Most of the faculty members of the University are involved in research by attracting

funded projects from various research level organizations like DST, VGST, DBT, DRDO, AICTE and industries. The outcome of the research is passed on to students through live projects from industries. The entrepreneurial zeal of the students is encouraged and nurtured through EDPs and EACs.

REVA University has entered into collaboration with many prominent industries to bridge the gap between industry and University. Regular visits to industries and mandatory internship with industries have helped our students. REVA University has entered into collaboration with many prominent industries to bridge the gap between industry and University. Regular visits to industries and mandatory internship with industries have helped our students become skilled with relevant to industry requirements. Structured training programs on soft-skills and preparatory training for competitive exams are offered here to make students more employable. 100% placement of eligible students speaks the effectiveness of these programs. The entrepreneurship development activities and establishment of "Technology Incubation Centers" in the University extend full support to the budding entrepreneurs to nurture their ideas and establish an enterprise.

With firm faith in the saying, "Intelligence plus character –that is the goal of education" (Martin Luther King, Jr.), I strongly believe REVA University is marching ahead in the right direction, providing a holistic education to the future generation and playing a positive role in nation building. We reiterate our endeavour to provide premium quality education accessible to all and an environment for the growth of over-all personality development leading to generating "GLOBAL PROFESSIONALS".

Welcome to the portals of REVA University!

**Dr. M Dhanamjaya**

Vice-Chancellor, REVA University

# Message from the Associate Dean

Dear students,

I hope this message finds you in good health and high spirits as we embark on a new academic year in the field of Allied Health Sciences, specifically in the exciting realm of Bachelor of Physiotherapy.

Welcome to our esteemed program!

Bachelor of Physiotherapy is a multidisciplinary field that merges the worlds of medical field. It is a domain that requires a deep understanding of the human anatomy, physiology, biomechanics, pathology, diagnosis & treatment of almost all kind of illness.

During your time in this program, you will delve into various subjects, including human anatomy, physiology, biochemistry, biomechanics, pathology, microbiology, medicine, general surgery, orthopaedic rehabilitation, neurological rehabilitation, cardio-respiratory rehabilitation, OBG rehabilitation, paediatric rehabilitation and so on. These areas of study are interconnected and will provide you with a comprehensive understanding of the factors influencing on human body system performance. Our dedicated faculty members are renowned experts in their respective fields, and they are committed to guiding you through this journey of knowledge and skill acquisition.

To excel in this course, I encourage you to actively engage in both theoretical and practical components of your studies. Participate in discussions, ask questions, and seek clarification when needed. Take advantage of the state-of-the-art laboratory facilities we have to offer, as they will serve as invaluable tools for hands-on learning and skill development. By immersing yourself fully in the learning process, you will not only gain knowledge but also cultivate the essential critical thinking and problem-solving skills necessary to excel in the field.

Collaboration is another key aspect of your journey. I urge you to foster a sense of camaraderie and teamwork among your peers. The ability to work effectively in interdisciplinary teams is vital in the Allied Health Sciences, and by embracing collaboration, you will learn from one another and develop the skills necessary for future professional success.

Lastly, never underestimate the importance of practical experience. Seek out internships, volunteer opportunities, and industry placements to gain real-world exposure. Physiotherapy is a field that thrives on theory and practical application, and by actively engaging with studying

each subject deeply, doing internships, and project, you will bridge the gap between theory and practice, enhancing your employability.

I am confident that with your dedication, enthusiasm, and the wealth of knowledge you will gain from this course, you will become leaders in the field of Physiotherapy. Remember, your journey here is not just about acquiring a degree, it is about embracing a lifelong commitment to improving the health and performance of individuals through evidence-based practices.

I wish you a rewarding and transformative experience in our Allied Health Sciences course. Embrace the challenges, seize the opportunities, and always strive for excellence.

Sincerely,

**Prof. Pasupuleti Visweswara Rao, FAPAS, FMSA, FIAAM**

Associate Dean,

School of Applied & Allied Health Sciences, REVA University

# Message from the Director

Bachelor of Physiotherapy (BPT) is Allied Health Sciences program assimilates in itself a number of disciplines and as such has grown rapidly. Bachelor of Physiotherapy offered by REVA University aims to provide the required skills and knowledge necessary to pursue a successful career in BPT. This program imparts need based, practical education in contemporary world to develop global competence among students. It strives to prepare students to become leaders in the field of Health Sciences in general and BPT in particular by encouraging them to inculcate scientific thinking coupled with creative and innovative ideas.

The program provides hands- on training and practical skills in the field of Physiotherapy in the Medical field.

As far as employment is concerned BPT has become one of the fast-growing sectors. Employment record shows that BPT has a great scope in future. Bachelor of Physiotherapy can find careers with Hospitals, Physiotherapy Clinics & Home Care.

The curriculum caters to and has relevance to local, regional, national, global developmental needs. Maximum number of courses are integrated with cross cutting issues with relevant to professional ethics, gender, human values, environment and sustainability.

This handbook provides you outline of regulations for bachelor's degree, scheme of instruction, and detailed syllabus. I am sure the students choosing Bachelor of Physiotherapy at REVA University will enjoy the curriculum, teaching and learning environment, the vast infrastructure and the experienced teacher's involvement and guidance. We will strive to provide all needed comfort and congenial environment for their studies. I wish all students a pleasant stay at REVA and grand success in their career.

**Dr. Jayashree S**
Director
School of Allied Health Sciences

## PREFACE

Higher education across the globe is opening doors of its academic disciplines to the real-world experiences. The disciplinary legitimacy is under critical review. Trans-border mobility and practice learning are being fore-grounded as guiding principles. Interactive learning, bridging disciplines and facilitating learners to gain different competencies through judicious management of time is viewed as one of the greatest and fascinating priorities and challenges today.

Indian economy is experiencing an upward growth right from the beginning of 21st century necessitating well qualified science graduates to work as scientists, teachers, algorithm developers, computer programmers, professionals and often administrators. At present more than 400 million youth are below 18 years of age and government is committed to increase the GER to 30% by 2020, further necessitating more number of teachers and professors to work in schools and colleges. Research has also been given equal importance. Private sector and Corporates are also looking for smart science graduates in a big way. The B.P T degree program of REVA University is designed to prepare scientists, teachers, professionals & administrators who are motivated, enthuastic & creative thinkers to meet the challenges of growing economy as well as to fulfil the growing aspirations of the youth.

The program has been developed with an emphasis on knowledge assimilation, application, national and international job market and its social relevance. The outcome-based curriculum designed and followed imbibes required theoretical concepts and practical skills in the domain. By undergoing this program, you will develop critical, analytical thinking and problem-solving abilities for a smooth transition from academic to real-life work environment. The L: T: P structure of teaching and learning under Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) would certainly help our students learn and build competencies needed in this knowledge-based society.

This handy document containing brief information about B.P.T (Physiotherapy) program, scheme of instruction and detailed course content will serve as a guiding path to you to move forward in a right direction.

I am sure you will enjoy the curriculum, teaching and learning environment, the vast infrastructure and the experienced teacher's involvement and guidance. We will strive to provide all needed comfort and congenial environment for your studies. I wish you and all students a pleasant stay in REVA and grand success in your career.

## CONTENTS

## RUKMINI EDUCATIONAL CHARITABLE TRUST

It was the dream of late Smt. Rukmini Shyama Raju to impart education to millions of underprivileged children as she knew the importance of education in the contemporary society. The dream of Smt. Rukmini Shyama Raju came true with the establishment of Rukmini Educational Charitable Trust (RECT), in the year 2002. Rukmini Educational Charitable Trust (RECT) is a Public Charitable Trust, set up in 2002 with the objective of promoting, establishing and conducting academic activities in the fields of Arts, Architecture, Commerce, Education, Engineering, Environmental Science, Legal Studies, Management and Science & Technology, among others. In furtherance of these objectives, the Trust has set up the REVA Group of Educational Institutions comprising of REVA Institute of Technology & Management (RITM), REVA Institute of Science and Management (RISM), REVA Institute of Management Studies (RIMS), REVA Institute of Education (RIE), REVA First Grade College (RFGC), REVA Independent PU College at Kattigenahalli, Ganganagar and Sanjaynagar and now REVA University. Through these institutions, the Trust seeks to fulfil its vision of providing world class education and create abundant opportunities for the youth of this nation to excel in the areas of Arts, Architecture, Commerce, Education, Engineering, Environmental Science, Legal Studies, Management and Science & Technology.

Every great human enterprise is powered by the vision of one or more extraordinary individuals and is sustained by the people who derive their motivation from the founders. The Chairman of the Trust is Dr. P. Shyama Raju, a developer and builder of repute, a captain of the industry in his own right and the Chairman and Managing Director of the DivyaSree Group of companies. The idea of creating these top notched educational institutions was born of the philanthropic instincts of Dr. P. Shyama Raju to do public good, quite in keeping with his support to other socially relevant charities such as maintaining the Richmond road park, building and donating a police station, gifting assets to organizations providing accident and trauma care, to name a few.

The Rukmini Educational Charitable Trust drives with the main aim to help students who are in pursuit of quality education for life. REVA is today a family of ten institutions providing education from PU to Post Graduation and Research leading to PhD degrees. REVA has well qualified experienced teaching faculty of whom majority are doctorates. The faculty is supported by committed administrative and technical staff. Over 15,000+ students study various courses across REVA's three campuses equipped with exemplary state-of-the-art infrastructure and conducive environment for the knowledge driven community.

## ABOUT REVA UNIVERSITY

REVA University has been established under the REVA University Act, 2012 of Government of Karnataka and notified in Karnataka State Gazette No. 80 dated 27thFebruary, 2013. The University is empowered by UGC to award degrees any branch of knowledge under Sec.22 of the UGC Act. The University is a Member of Association of Indian Universities, New Delhi. The main objective of the University is to prepare students with knowledge, wisdom and patriotism to face the global challenges and become the top leaders of the country and the globe in different fields.

REVA University located in between Kempegowda International Airport and Bangalore city, has a sprawling green campus spread over 45 acres of land and equipped with state-of-the-art infrastructure that provide conducive environment for higher learning and research. The REVA campus has well equipped laboratories, custom-built teaching facilities, fully air-conditioned library and central computer centre, the well planned sports facility with cricket ground, running track & variety of indoor and outdoor sports activities, facilities for cultural programs. The unique feature of REVA campus is the largest residential facility for students, faculty members and supportive staff.

REVA consistently ranked as one of the top universities in various categories because of the diverse community of international students and its teaching excellence in both theoretical and technical education in the fields of Engineering, Management, Law, Science, Commerce, Arts, Performing Arts, and Research Studies. REVA offers 28 Undergraduate Programmes, 22 Full-time and 2 Part-time Postgraduate Programmes, 18 Ph. D Programmes, and other Certificate/ Diploma/Postgraduate Diploma Programmes in various disciplines.

The curriculum of each programme is designed with a keen eye for detail by giving emphasis on hands-on training, industry relevance, social significance, and practical applications. The University offers world-class facilities and education that meets global standards.

The programs being offered by the REVA University are well planned and designed after detailed study with emphasis with knowledge assimilation, applications, global job market and their social relevance. Highly qualified, experienced faculty and scholars from reputed universities / institutions, experts from industries and business sectors have contributed in

preparing the scheme of instruction and detailed curricula for this program. Greater emphasis on practice in respective areas and skill development to suit to respective job environment has been given while designing the curricula. The Choice Based Credit System and Continuous Assessment Graded Pattern (CBCS – CAGP) of education has been introduced in all programs to facilitate students to opt for subjects of their choice in addition to the core subjects of the study and prepare them with needed skills. The system also allows students to move forward under the fast track for those who have the capabilities to surpass others. These programs are taught by well experienced qualified faculty supported by the experts from industries, business sectors and such other organizations. REVA University has also initiated many supportive measures such as bridge courses, special coaching, remedial classes, etc., for slow learners so as to give them the needed input and build in them confidence and courage to move forward and accomplish success in their career. The University has also entered into MOUs with many industries, business firms and other institutions seeking their help in imparting quality education through practice, internship and also assisting students' placements.

REVA University recognizing the fact that research, development and innovation are the important functions of any university has established an independent Research and Innovation division headed by a senior professor as Dean of Research and Innovation. This division facilitates all faculty members and research scholars to undertake innovative research projects in engineering, science & technology and other areas of study. The interdisciplinary-multidisciplinary research is given the top most priority. The division continuously liaisons between various funding agencies, R&D Institutions, Industries and faculty members of REVA University to facilitate undertaking innovative projects. It encourages student research projects by forming different research groups under the guidance of senior faculty members. Some of the core areas of research wherein our young faculty members are working include Data Mining, Cloud Computing, Image Processing, Network Security, VLSI and Embedded Systems, Wireless Censor Networks, Computer Networks, IOT, MEMS, Nano- Electronics, Wireless Communications, Bio-fuels, Nano-technology for coatings, Composites, Vibration Energies, Electric Vehicles, Multilevel Inverter Application, Battery Management System, LED Lightings, Renewable Energy Sources and Active Filter, Innovative Concrete Reinforcement, Electro Chemical Synthesis, Energy Conversion Devices, Nano-structural Materials, Photo-electrochemical Hydrogen generation, Pesticide Residue Analysis, Nano materials, Photonics, Nana Tribology, Fuel Mechanics, Operation Research, Graph theory, Strategic Leadership and Innovative Entrepreneurship, Functional Development Management,

Resource Management and Sustainable Development, Cyber Security, General Studies, Feminism, Computer Assisted Language Teaching, Culture Studies etc.

The REVA University has also given utmost importance to develop the much required skills through variety of training programs, industrial practice, case studies and such other activities that induce the said skills among all students. A full-fledged Career Development and Placement (CDC) department with world class infrastructure, headed by a dynamic experienced Professor& Dean, and supported by well experienced Trainers, Counsellors and Placement Officers.

The University also has University-Industry Interaction and Skill Development Centre headed by a Senior Professor & Director facilitating skill related training to REVA students and other unemployed students. The University has been recognised as a Centre of Skill Development and Training by NSDC (National Skill Development Corporation) under Pradhan Mantri Kaushal VikasYojana. The Centre conducts several add-on courses in challenging areas of development. It is always active in facilitating student's variety of Skill Development Training programs.

The University has collaborations with Industries, universities abroad, research institutions, corporate training organizations, and Government agencies such as Florida International University, Oklahoma State University, Western Connecticut University, University of Alabama, Huntsville, Oracle India Ltd, Texas Instruments, Nokia University Relations, EMC2, VMware, SAP, Apollo etc, to facilitate student exchange and teacher–scholar exchange programs and conduct training programs. These collaborations with foreign universities also facilitates students to study some of the programs partly in REVA University and partly in foreign university, viz, M.S in Computer Science one year in REVA University and the next year in the University of Alabama, Huntsville, USA.

The University has also given greater importance to quality in education, research, administration and all activities of the university. Therefore, it has established an independent Internal Quality division headed by a senior professor as Dean of Internal Quality. The division works on planning, designing and developing different quality tools, implementing them and monitoring the implementation of these quality tools. It concentrates on training entire faculty

to adopt the new tools and implement their use. The division further works on introducing various examination and administrative reforms.

To motivate the youth and transform them to become innovative entrepreneurs, successful leaders of tomorrow and committed citizens of the country, REVA organizes interaction between students and successful industrialists, entrepreneurs, scientists and such others from time to time. As a part of this exercise great personalities such as Bharat Ratna Prof. C. N. R. Rao, a renowned Scientist, Dr. N R Narayana Murthy, Founder and Chairman and Mentor of Infosys, Dr. K Kasturirangan, Former Chairman ISRO, Member of Planning Commission, Government of India, Dr. Balaram, Former Director IISc., and noted Scientist, Dr. V S Ramamurthy, Former Secretary, DST, Government of India, Dr. V K Aatre, noted Scientist and former head of the DRDO and Scientific Advisor to the Ministry of Defence Dr.Sathish Reddy, Scientific Advisor, Ministry of Defence, New Delhi and many others have accepted our invitation and blessed our students and faculty members by their inspiring addresses and interaction.

REVA organises various cultural programs to promote culture, tradition, ethical and moral values to our students. During such cultural events the students are given opportunities to unfold their hidden talents and motivate them to contribute innovative ideas for the progress of the society. One of such cultural events is REVAMP conducted every year. The event not only gives opportunities to students of REVA but also students of other Universities and Colleges. During three days of this mega event students participate in debates, Quizzes, Group discussion, Seminars, exhibitions and variety of cultural events. Another important event is Shubha Vidaaya, - Graduation Day for the final year students of all the programs, wherein, the outgoing students are felicitated and are addressed by eminent personalities to take their future career in a right spirit, to be the good citizens and dedicate themselves to serve the society and make a mark in their respective spheres of activities. During this occasion, the students who have achieved top ranks and won medals and prizes in academic, cultural and sports activities are also recognised by distributing awards and prizes. The founders have also instituted medals and prizes for sports achievers every year. The physical education department conducts regular yoga class’s every day to students, faculty members, administrative staff and their family members and organizes yoga camps for villagers around.

## Vision

REVA University aspires to become an innovative university by developing excellent human resources with leadership qualities, ethical and moral values, research culture and innovative skills through higher education of global standards.

- **Mission**

- To create excellent infrastructure facilities and state-of-the-art laboratories and incubation centres.
- To provide student-centric learning environment through innovative pedagogy and education reforms.
- To encourage research and entrepreneurship through collaborations and extension activities.
- To promote industry-institute partnerships and share knowledge for innovation and development.
- To organize society development programs for knowledge enhancement in thrust areas.
- To enhance leadership qualities among the youth and enrich personality traits, promote patriotism and moral values.

## Objectives

- Creation, preservation and dissemination of knowledge and attainment of excellence in different disciplines.
- Smooth transition from teacher -centric focus to learner-centric processes and activities.
- Performing all the functions of interest to its major constituents like faculty, staff, students and the society to reach leadership position.
- Developing a sense of ethics in the University and Community, making it conscious of its obligations to the society and the nation.
- Accepting the challenges of globalization to offer high quality education and other services in a competitive manner.

## ABOUT SCHOOL OF ALLIED HEALTH SCIENCES

The School of Allied Health Sciences offers graduate and post graduate programs in Biochemistry, Medical Laboratory Technician, Medical Radiology and Diagnostic Imaging, Nutrition and Dietetics, Physiotherapy, which are incredibly fascinating. It aims to attract talented youth and train them to acquire knowledge and skills useful to industrial sectors, research laboratories and educational institutions. The school also facilitates research leading to PhD in Biochemistry, Microbiology and related areas of study.

The School of Allied Health Sciences is shouldered by well qualified, experienced and highly committed faculty. The state-of-the-art infrastructure digital classrooms, well equipped laboratories, conference rooms and the serene academic atmosphere at REVA University will enhance the transfer as well as creation of knowledge. The school provides an interactive, collaborative peer tutoring environment that encourage students to break down complex problems and develop strategies for finding solutions across a variety of situations and disciplines. The school aims to develop a learning community of critical thinkers who serves as models of innovative problems solving in the university environment to enrich their academic and professional careers.

### Vision

To nurture intellect, creativity, character and professional is among students and impart contemporary knowledge in various branches of Biological and Allied health Sciences that are socially relevant and transform them to become global health care citizens.

### Mission

To offer world class expertise in medical imaging and advanced diagnostic sciences including research through excellence in teaching and support interface between industry and multi-speciality hospitals.

## BoS Members

| Sl.No. | Name of the Member | Designation |
|---|---|---|
| 1 | **Dr. Jayashree S**<br>Prof. and HOD<br>School of Biochemistry, REVA University<br>jayashrees@reva.edu.in<br>8610123372 | Chairperson |
| 2 | **Prof. Joyce V Chacko**<br>Assistant Professor<br>SB College of Physiotherapy<br>joycevchako11@gmail.com | External Member |
| 3 | **Prof. Linu Elizabeth Epapen**<br>Assistant Professor<br>Christian College of Physiotherapy<br>linuvijish@gmail.com | External Member |
| 4 | **Dr. Ramesh Kumar Kushwaha**<br>School of Biochemistry, REVA University<br>rameshkumar.k@reva.edu.in<br>7905947987 | Internal Member |
| 5 | **Prof. Abhilash G.L**<br>Assistant Professor<br>School of Allied Health Sciences<br>REVA University<br>abhilash.gl@reva.edu.in | Internal Member |
| 6 | **Prof. Jismon Jose**<br>Assistant Professor<br>School of Allied Health Sciences<br>REVA University<br>jismon.jose@reva.edu.in | Internal Member |

## Bachelor of Physiotherapy

### Programme Overview

Physiotherapy is an allied health profession, which emphasizes the use of physical agents in the management of diseases, prevention & rehabilitation of disabling conditions. Physiotherapy deals with problems particularly those associated with Neuromuscular, Musculo-skeletal and Cardio- vascular & Respiratory systems. The therapeutic methods are based essentially on manual therapy, electro therapy and use of other physical agents. The Bachelor of Physiotherapy (B.P.T) is an Allied Health specialty program that deals with the diagnosis, treatment and prevention of diseases/disorders through the evaluation and treatment procedures. As important members of the health care group, physiotherapists play an important role in collecting the information required to provide the best care to an ill or injured patient. In this programme, the students learn to perform evaluation and management procedures that aid in the diagnosis and treatment of diseases.

A Physiotherapist is trained to assess, plan and provide therapeutic services to the individual with sensory and motor deficits. After successful completion of the course, a student can seek placement as a physiotherapist in hospitals, rehabilitation centres, Physiotherapy clinics and as a faculty in the concerned subject etc. The avenues for higher studies & research are also there. The specialization in physiotherapy in the area of Orthopaedics, Neurology, OBG, Paediatrics, Sports rehabilitation, Cardio respiratory physiotherapy etc. are available. Specialized techniques in the field of manual therapy & electrotherapy etc. are coming up.

REVA UNIVERSITY has designed to offer B.P.T degree programme towards human health care assessment and management of diseases/ disorders to contribute towards a healthy nation. The B.P.T degree programme has been planned and designed after a detailed study and interactions with various universities, research establishments and stake holders.

**PROGRAM EDUCATION OBJECTIVES (PEOs):**

| | |
|---|---|
| **PEO 1** | Demonstrate problem solving skills in performing routine Physiotherapy evaluation and treatment procedures by communicating effectively with the patient or either leading a team or as a team member in a clinical facility. |
| **PEO 2** | Express oral and written interpersonal skills as part of the health care teams requirements to understand, learn and advance their careers through clinical care developments and seeking higher learning. |
| **PEO 3** | Understand the professional, ethical and social responsibilities through lifelong learning skills. |

## Programme Outcomes (POs):

**PO1- Professional knowledge**: Possess and acquire scientific knowledge to work as a health care professional.

**PO2- Clinical/ Technical skills**: Demonstrate and possess clinical skills to provide quality health care services.

**PO3- Team work**: Demonstrate team work skills to support shared goals with the interdisciplinary health care team to improve societal health.

**PO4- Ethical value & professionalism**: Possess and demonstrate ethical values and professionalism within the legal framework of the society.

**PO5- Communication**: Communicate effectively and appropriately with the interdisciplinary health care team and the society.

**PO6- Entrepreneurship, leadership and mentorship**: Display entrepreneurship, leadership and mentorship skills to practice independently as well as in collaboration with the interdisciplinary health care team.

**PO7- Evidence based practice**: Demonstrate high quality evidence-based practice that leads to excellence in professional practice.

**PO8- Life-long learning**: Enhance knowledge and skills with the use of advancing technology for the continual improvement of professional practice.

## Programme Specific Outcomes (PSOs)

**PSO1**. Demonstrate the knowledge of physiotherapy assessment and treatment procedures.

**PSO2**. Apply the concepts in the design, development and implementation of application-oriented physiotherapy solutions.

**PSO3**. Comprehend the fundamentals of physiotherapy skills and undertake advanced level of knowledge to analyse and create techniques to solve real life problems.

# REVA University Regulations for Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) for Science Graduate Degree Programs, 2023-2024

(Framed as per the provisions under Section 35 (ii), Section7 (x) and Section 8 (xvi) & (xxi) of the REVA University Act, 2012)

**1. Title and Commencement:**

1.1 These Regulations shall be called the "REVA University Regulations for Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) for Under Graduate Degree Programs-2023-2024".

1.2 These Regulations shall come into force from the date of assent of the Chancellor.

**2. The Programs:**

The following programs and all Graduate Degree programs to be instituted and introduced in REVA University in coming years shall follow these regulations.

1. Bachelor of Physiotherapy- B.P.T
2. B.Sc. in:
    - Medical Laboratory Technology
    - Biotechnology, Biochemistry and Genetics Physics Chemistry and Mathematics
    - Mathematics, Physics and Statistics
    - Mathematics, Statistics and Computer Science Bioinformatics, Biology Mathematics & Computer Science

**3. Definitions:**

**Course**: Every course offered will have three components associated with the teaching-learning process of the course, namely:

(i) L=Lecture (ii) T=Tutorial (iii) P=Practice; where:

**L** stands for **Lecture** session consisting of classroom instruction.

**T** stands for **Tutorial** session consisting participatory discussion / self-study/ deskwork/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture classes.

**P** stands for **Practice** session and it consists of Hands-on Experience / Laboratory Experiments /Field Studies / Case Studies that equip students to acquire the much-required skill component.

**4. Courses of study and Credits**

4.1 The study of various subjects in B.Sc., degree program is grouped under various courses. Each of these course carries credits which are based on the number of hours of teaching and learning.

4.1.1 In terms of credits, every one-hour session no of L amounts to 1 credit per Semester. In terms of credits, every one-hour session of L amounts to 1 credit per Semester and a minimum of two-hour session of T or P amounts to 1 credit per Semester over a period of one Semester of 16 weeks forteaching-learning process.

4.1.2 The total duration of a semester is 20 weeks inclusive of semester-end examination.

4.1.3 A course shall have either or all the four components. That means a course may have only lecture component, or only practical component or combination of any two or all the three components.

4.1.4 The concerned BoS will assign Credit Pattern for every course based on the requirement. However, generally, courses can be assigned with 1-4 Credits depending on the size of the course.

4.1.5 Different Courses of Study are labelled and defined as follows:

**(1) Core Course:**

A course which should compulsorily be studied by a candidate as a core-requirement is termed as a Core course. The CORE courses of Study are of THREE types, viz – (i) Hard Core Course, and (ii) Soft Core Course.

**(i) Hard Core Course (HC):**

The Hard-Core Course is a Core Course in the main branch of study and related branch (es) of study, if any that the candidates have to complete compulsorily.

**(ii) Soft Core Course (SC):**

A Core course may be a Soft Core if there is a choice or an option for the candidate to choose a course from a pool of courses from the main branch of study or from a sister/ related branch of study which supports the main branch of study.

**(iii) Open Elective Course:**

An elective course chosen generally from other discipline / subject, with an intention to seek exposure to the basics of subjects other than the main discipline the student is studying is called Open Elective Course.

Clinical Postings and Internship/:

Clinical Postings /Internship is a special course involving application of knowledge in solving

/analysing /exploring a real-life situation / difficult problem. Clinical postings are scheduled in from the third semester, and have 3 credits per semester. Internship carrying FIFTEEN credits are to be undergone by the students after successful completion of 8 semesters. Clinical Postings/Internship may be a hard core or a Soft Core as decided by the BoS/ concerned.

**d. Project Work / Dissertation:**

Project work / Dissertation work is a special course involving application of knowledge in solving / analysing /exploring a real-life situation / difficult problem. A project work carrying FOUR or SIX credits is called Minor Project work / Dissertation. A project work of EIGHT, TEN, TWELVE or SIXTEEN credits is called Major Project work / Dissertation. A Project work may be a hard core or a Soft Core as decided by the BoS / concerned.

**5. Eligibility for Admission:**

Pass in PUC/10+2 examination with life science/ Biology as compulsory subjects with minimum 45% marks (40% in case of candidate belonging to SC/ST category) in the above subjects taken together of any Board recognized by the respective State Government /Central Government / Union Territories.

**6. Scheme, Duration and Medium of Instructions:**

6.1 The Four-Year degree program is of 8 semesters (4 years) duration. A candidate can avail a maximum of 16 semesters (8years) as per double duration norm, in one stretch to complete the Four-Year Degree, including blank semesters, if any. Whenever a candidate opts for blank semester, he/she has to study the prevailing courses offered by the school when he/she resumes his/her studies.

6.2. The medium of instruction shall be English.

**7. Credits and Credit Distribution**

7.1 A candidate has to earn 206 credits for successful completion of Four-Year Degree Bachelor of Physiotherapy with a distribution of credits as given inTable-1below:

**Table-1**

**Credits and Credit Distribution for Four Year degree programs**

| Course Type | Credits for Four Year Degree (semesters) |
|---|---|
| AEC | 4 |
| HC | 198 |
| OEC | 0 |
| SC | 2 |
| MC | 2 |
| **Total** | **206** |

Internship 6 months - 24 credits

7.2 The concerned BOS, based on the credit distribution pattern given above shall prescribe the credits to various types of courses and shall assign title to every course including project work, practical work, and field work, self-study elective, as **Hard Core (HC) Soft Core (SC) or Open Elective (OE)**.

7.3 Every course including project work, practical work, Clinical Postings, self-study elective should be entitled as Foundation Course (FC), Hard Core (HC) or Soft Core (SC) or Open Elective (OE) by the BoS concerned. The concerned BOS shall specify the desired Program Objectives, Program Educational Objectives, Program Specific Outcomes and Course Outcomes while preparing the curriculum of a particular program.

7.4 A candidate can enrol for a maximum of 26 credits and a minimum of 17 credits per Semester. However, he / she may not successfully earn a maximum of 26 credits per semester. This maximum of 26 credits does not include the credits of courses carried forward by a candidate.

7.5 Only such full-time candidates who register for a minimum prescribed number of credits in each semester from I semester to VIII semester and complete successfully 182 credits in 8 successive semesters, and six months internship of 24 credits shall be considered for declaration of Ranks.

7.6 Medals, Prizes and are eligible to apply for Student Fellowship, Scholarship, Free ships, and such other rewards /advantages which could be applicable for all full-time students and for hostel facilities.

**8. Add-on Proficiency Certification/Diploma:**

**8.1 Add-on Proficiency Certification:**

To acquire Add on Proficiency Certification a candidate can opt to complete a minimum of 2 extra credits either in the same discipline /subject or in different discipline /subject in excess to 182 credits for the Four-Year Graduate degree programs.

**8.2 Addon Proficiency Diploma:**

To acquire Addon Proficiency Diploma, a candidate can opt to complete a minimum of 2 extra credits either in the same discipline /subject or in different discipline / subject in excess to 182 credits for the Four-Year Graduate degree programs.

The Add on Proficiency Certification /Diploma so issued to the candidate contains the courses studied and grades earned.

**9. Assessment and Evaluation**

a) Each course is assessed for a total weight of 100%. Out of the total 100% weight; 50% weight is for Continuous Internal Assessment (CIA or IA) and the remaining 50% for the Semester End Examination (SEE). This is applicable for theory, laboratory, workshop, studio and any such courses

b) Out of 50% weight earmarked for Internal Assessment (IA)-15% for test-1, 15% for test-2 and 20% for Assignments and this is applicable for theory-based courses.

c) The tests and assignments are conducted as per the semester academic calendar provided by the University.

**The details as given in the table.**

| Component | Description | Conduction | Weight Percentage |
|---|---|---|---|
| C1 | Test-1: IA1 | 6$^{th}$ week from the starting date of semester | 15 |
| | Test-2: IA2 | 12$^{th}$week from the starting date of semester | 15 |

| | | | |
|---|---|---|---|
| C2 | 1 Assignment | 7thweek | 10 |
| | 2 Assignment | 13thweek | 10 |
| | | | |
| C3 | SEE includingpractical & ClinicalPostings Report | Between 17th Week-20th Week | 50 |
| Results to be Announced | | | By the end of 21st Week |

**Note: IA or CIA includes C1 and C2**

Each test must be conducted for a duration of 60 minutes, setting the test question paper for a maximum of 30 marks. The final examination must be conducted for a duration of 3 hours and the question paper must be set for a maximum of 100 marks.

a) Students are required to complete courses like technical skills, placement related courses, Open electives and any such value addition or specialized courses through online platforms like SWAYAM/ NPTEL/ Any other reputed online education aggregator. Students are required to choose the courses on the advice of their course coordinator /Director and required to submit the course completion certificate along with percentage of marks/grade scored in the assessment conducted by the online education aggregator. If the online education aggregator has issued a certificate along with the grade or marks scored to students, such courses will be considered for SGPA calculations, in case the aggregator has issued only a certificate and not marks scored, then such courses will be graded through an examination by concerned School, in case, if grading is not possible, students will be given a pass grade and award the credit and the credits will not be considered for SGPA calculations.

b) The Online/ MOOCs courses will not have continuous internal assessment component. Such of those students who would like to discontinue with the open elective course that they have already registered for earning required credits can do so, however, they need to complete the required credits by choosing an alternative open elective course.

Setting question paper and evaluation of answer scripts.

1) For SEE, three sets of question papers shall be set for each theory course out of which two sets will be by the internal examiners and one set will be by an external examiner. In subsequent years by carrying forward the unused question papers, an overall three sets of question papers should be managed and depending on the consumption of

question papers either internal or external examiner be called for setting the question paper to maintain an overall tally of 3 papers with the conditions mentioned earlier. The internal examiner who sets the question paper should have been course tutor.

2) The Chairman of BoE shall get the question papers set by internal and external examiners.
3) The Board of Examiners shall scrutinize and approve the question papers and scheme of valuation. It is the responsibility of the BoE to see that all questions contained in the question paper are within the prescribed syllabus of the concerned course.

1. There shall be single valuation for all theory papers by internal examiners. However, there shall be moderation by the external examiner who has the subject back ground. In case no external examiner with subject background is available, a senior faculty member within the discipline shall be appointed as moderator.

2. The SEE examination for Practical work / Field work / Project work/Internship will be conducted jointly by internal and external examiners as detailed below: However, the BoE on its discretion can also permit two internal examiners.

If a course is fully of (L=2): (T=0) (P=0) type or course is partly P type i.e, (L=3): (T=0) (P=1), then the examination for SEE component will be as decided by the BoS concerned.

**10. Evaluation of Practical's and Minor Project / Major Project / Dissertation /Clinical Postings**

9.1 A practical examination shall be assessed on the basis of:

- ✓ Knowledge of relevant processes;
- ✓ Skills and operations involved;
- ✓ Results/ products including calculation and reporting.

9.1.1 In case a course is fully of P type (L=0:T=0:P=4),the performance of a candidate shall be assessed for a maximum of 100 marks as explained below:

9.1.1.1 Continuous Internal assessment (CIA) = 50 marks

9.1.1.2 Semester end practical examination (SEE)=50 marks

The 25 marks for continuous assessment shall further be allocated as under (IA or CIA):

| | | |
|---|---|---|
| i | Conduction of regular practical throughout the semester | 20 marks |
| ii | Maintenance of lab records/ industry reports | 15 marks |

| | | |
|---|---|---|
| iii | Laboratory test and viva | 15 marks |
| | **Total** | **50 marks** |

| | | |
|---|---|---|
| i | Conduction of semester end practical examination | 30 marks |
| ii | Write up about the experiment /practical conducted | 10 marks |
| iii | Viva Voce | 10 marks |
| | **Total** | **50 marks** |

- ✓ The SEE for Practical work will be conducted jointly by internal and external examiners.
- ✓ However, if external examiner does not turn up, then both the examiners will be internal examiners.
- ✓ In case a course is partly P type i.e, (L=3): (T=0) (P=1), then the examination for SEE component will be as decided by the BoS concerned.
- ✓ The duration for semester- end practical examination shall be decided by the concerned School/Board.

10.2 Evaluation of Internship/ Clinical Postings:

Right from the initial stage of defining the problem, the candidate has to submit the progress reports periodically and also present his/her progress in the form of seminars in addition to the regular discussion with the supervisor. At the end of the semester, the candidate has to submit final report to the project/dissertation, as the case maybe, for final evaluation. The components of evaluation are as follows:

| | | | |
|---|---|---|---|
| 1 | Clinical Observational Postings | Should be done at the commencement of 3rd semester, continued till end of 4th semester | Weightage: 0% |
| 2 | Clinical Postings | 7th week of 5th semester, continued till end of 6th semester | Weightage: 25% |

| | | | |
|---|---|---|---|
| 3 | Clinical Postings | 14th week from the start date ofproject semester, till end of 8thsemester | Weightage: 25% |
| 4 | Project work | 8th semester | Weightage: 25% for Dissertation |
| 5 | Internship | After successful completionof all 8 semesters | Weightage: 25% |

**11. Provision for Appeal**

If a candidate is not satisfied with the evaluation of C1, C2 components, he/she can approach the grievance cell with the written submission together with all facts, the assignments, test papers etc., which were evaluated. He/she can do so before the commencement of semester-end examination. The grievance cell is empowered to revise the marks if the case is genuine and is also empowered to levy penalty as prescribed by the university on the candidate if his/her submission is found to be baseless and unduly motivated. This cell may recommend taking disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the grievance cell is final.

For every program there will be one grievance cell. The composition of the grievance cell is as follows:

- The Registrar (Evaluation) -Ex-officio Chairman / Convener
- One Senior Faculty Member (other than those concerned with the evaluation of the course concerned) drawn from the school / department/discipline and/or from the sister schools /departments/sister disciplines– Member.
- One Senior Faculty Members / Subject Experts drawn from outside the University school /department– Member.

**12. Eligibility to Appear Semester End Examination (SEE)**

12.1 Only those students who fulfil a minimum of 75% attendance in aggregate of all the courses including practical courses / field visits etc., as part of the course(s), as provided in the succeeding sections, shall be eligible to appear for SEE examination.

12.2 Requirements to Pass a Course

Students are required to score a total minimum of 40% (Continuous Internal assessment and SEE) in each course offered by the University/ Department for a pass (other than online courses) with a minimum of 25% (12) marks in final examination.

**13. Requirements to Pass the Semester**

To pass the semester, a candidate has to secure minimum of 40% marks in each subject / course of the study prescribed in that semester.

13.1 Provision to Carry Forward the Failed Subjects / Courses:

A student who has failed in a given number of courses in odd and even semesters of first year shall move to third semester of second and final year of the study. However, he / she shall have to clear all courses of all semesters within the double duration, i.e., within eight years of admission of the first semester failing which the student has to re-register to the entire program.

13.2 Provision to Withdraw Course:

A candidate can withdraw any course within ten days from the date of notification of final results. Whenever a candidate withdraws a course, he/she has to register for the same course in case it is hard core course, the same course or an alternate course if it is Soft Core Course or Open Elective Course.

A dropped course is automatically considered as a course withdrawn.

13.3 Re-Registration and Re-Admission:

a) In case a candidate's class attendance in aggregate of all courses in a semester is less than75% or as stipulated by the University, such a candidate is considered as dropped the semester and is not allowed to appear for end semester examination (C3) and he / she shall have to seek re-admission to that semester during subsequent semester/ year within a stipulated period.

b) In such case where in a candidate drops all the courses in a semester due to personal reasons, it is considered that the candidate has dropped the semester and he / she shall seek re- admission to such dropped semester.

**14 Attendance Requirement:**

14.1 All students must attend every lecture, tutorial and practical classes, clinical postings.

14.2 In case a student is on approved leave of absence (e g:- representing the university in sports, games or athletics, placement activities, NCC, NSS activities and such others) and / or any other such contingencies like medical emergencies, the attendance requirement shall be minimum of 75% of the classes taught.

a) Any student with less than 75% of attendance in aggregate of all the courses including practical courses / field visits etc., during a semester shall not be permitted to appear to the end semester(C4) examination and such student shall seek re-admission as provided in7.8.4.

b) Teachers offering the courses will place the above details in the School Board meeting during the last week of the semester, before the commencement of C3, and subsequently a notification pertaining to the above will be brought out by the Director of the School before the commencement of C3 examination. A copy of this notification shall also be sent to the office of the Registrar & Registrar (Evaluation).

**15. Absence during Mid Semester Examination:**

In case a student has been absent from a mid-semester (C1, C2) examination due to the illness or other contingencies he / she may give a request along with necessary supporting documents and certification from the concerned class teacher / authorized personnel to the concerned Head of the School, for make-up examination. The Head of the School may consider such request depending on the merit of the case and after consultation with course instructor and class teacher, and arrange to conduct a special test for such candidate(s) well in advance before the C3 examination of that respective semester. Under no circumstances C1, C2 test shall be held after C3 examination.

**16. Grade Card and Grade Point**

16.1 **Provisional Grade Card**: The tentative / provisional grade card will be issued by the Registrar (Evaluation) at the end of every semester indicating the courses completed successfully. The provisional grade card provides Semester Grade Point Average (SGPA).

16.2 **Final Grade Card**: Upon successful completion of M.Sc., Degree a Final Grade card consisting of grades of all courses successfully completed by the candidate will be issued by the Registrar (Evaluation).

16.3 **The Grade and the Grade Point**: The Grade and the Grade Point earned by the candidate in the subject will be as given below.

| Marks<br>P | Grade<br>G | Grade Point<br>(GP=Vx G) | Letter Grade |
|---|---|---|---|
| 90 >100 | 10 | v*10 | O |
| 80 > 90 | 9 | v*9 | A+ |
| 70 > 80 | 8 | v*8 | A |
| 60 > 70 | 7 | v*7 | B+ |
| 55 > 60 | 6 | v*6 | B |
| 50 > 55 | 5.5 | V*5.5 | C+ |
| 40 > 50 | 5 | v*5 | P |
| 0 - 40 | 0 | v*0 | F |
| ABSENT | | | AB |

O-Outstanding; A-Excellent; B-Very Good; C-Good; D-Fair; E-Satisfactory; F-Fail

Here, P is the percentage of marks (P=[C1+C2+C3]) secured by a candidate in a course which is **rounded to nearest integer**. V is the credit value of course. G is the grade and GP is the grade point.

16.3.1 Computation of SGPA and CGPA

The Following procedure to compute the Semester Grade Point Average (SGPA)

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student in a given semester, i.e:

**SGPA(Si)=∑(CixGi)/∑Ci**

Where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

**Illustration for Computation of SGPA and CGPA Illustration No. 1**

| Course | Credit | Grade Letter | Grade Point | Credit Point(Credit x Grade) |
|---|---|---|---|---|
| Course1 | 4 | A+ | 9 | 4X9=36 |
| Course2 | 4 | A | 8 | 4X8=32 |
| Course3 | 3 | B+ | 7 | 3X7=21 |
| Course4 | 3 | O | 10 | 3X10=30 |
| Course5 | 3 | P | 5 | 3X5=15 |
| Course6 | 3 | B | 6 | 3X6=18 |
| Course7 | 2 | O | 10 | 2X10=20 |
| Course8 | 2 | A | 8 | 2X8=16 |
| | 24 | | | 188 |

Thus, **SGPA =188 ÷ 24= 7.83**

**IllustrationNo.2**

| Course | Credit | Grade letter | Grade Point | Credit Point (Credit x Grade point) |
|---|---|---|---|---|
| Course 1 | 4 | A | 8 | 4X8=32 |
| Course 2 | 4 | B+ | 7 | 4X7=28 |

| | | | | |
|---|---|---|---|---|
| Course 3 | 3 | A+ | 9 | 3X9=27 |
| Course 4 | 3 | B+ | 7 | 3X7=21 |
| Course 5 | 3 | B | 6 | 3X6=18 |
| Course 6 | 3 | P | 5 | 3X5=15 |
| Course 7 | 2 | B+ | 7 | 2X7=21 |
| Course 8 | 2 | O | 10 | 2X10=20 |
| | 24 | | | 175 |

Thus, **SGPA =175 ÷ 24 = 7.2**

**Illustration No.3**

| Course | Credit | Grade Letter | Grade Point | Credit Point (Credit x Grade point) |
|---|---|---|---|---|
| Course 1 | 4 | O | 10 | 4x 10 = 40 |
| Course 2 | 4 | A+ | 9 | 4 x 9= 36 |
| Course 3 | 3 | B+ | 7 | 3 x 7= 21 |
| Course 4 | 3 | B | 6 | 3 x 6= 18 |
| Course 5 | 3 | A+ | 9 | 3 x 9= 27 |
| Course 6 | 3 | B+ | 7 | 3 x 7= 21 |
| Course 7 | 2 | A+ | 9 | 2 x 9= 18 |
| Course 8 | 2 | A+ | 9 | 2 x 9= 18 |
| | 24 | | | 199 |

Thus, **SGPA =199 ÷ 24= 8.29**

**Cumulative Grade Point Average (CGPA)**:

Overall Cumulative Grade Point Average (CGPA) of a candidate after successful completion of the required number of credits (96) for Two year Post Graduate degree program is calculated taking into account all the courses undergone by a student overall the semesters of a program i.e.,

$$\mathbf{CGPA=\sum(CixSi)/\sum Ci}$$

Where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

**Illustration: No.1**

CGPA after Final Semester

| Semester (ith) | No. of Credits (Ci) | SGPA (Si) | Credits x SGPA (Ci X Si) |
|---|---|---|---|
| 1 | 24 | 6.83 | 24 x6.83 =163.92 |
| 2 | 24 | 7.71 | 24 x7.71 =185.04 |
| 3 | 24 | 8.68 | 24 x8.68 =208.32 |
| 4 | 24 | 9.20 | 24 x9.20 =220.80 |
| Cumulative | 96 | | 778.08 |

Thus, **CGPA = 24x6.83+24x7.13+24x8.68+24x9.20 = 8.11**

### 16.3.2 CONVERSION OF GRADES INTO PERCENTAGE:

Conversion formula for the conversion of CGPA into Percentage is:

**Percentage of marks scored = CGPA Earned x10**

**Illustration: CGPA Earned 8.10x10=81.0**

### 16.3.3 Classification of Results

The final grade point (FGP) to be awarded to the student is based on CGPA secured by the candidate and is given as follows.

| CGPA | Grade (Numerical Index) G | Letter Grade | Performance | FGP Qualitative Index |
|---|---|---|---|---|
| 9>=CGPA10 | 10 | O | Outstanding | Distinction |
| 8>=CGPA<9 | 9 | A+ | Excellent | |
| 7>=CGPA<8 | 8 | A | Very Good | First Class |
| 6>=CGPA<7 | 7 | B+ | Good | |
| 5.5>=CGPA<6 | 6 | B | Above average | Second Class |
| >5CGPA <5.5 | 5.5 | C | Average | |
| >4 CGPA <5 | 5 | P | Pass | Satisfactory |

**Overall percentage=10*CGPA**

**17. Challenge Valuation**

a. A student who desires to apply for challenge valuation shall obtain a photo copy of the answer script by paying the prescribed fee within 10 days after the announcement of the results. He /She can challenge the grade awarded to him/ her by surrendering the grade card and by submitting an application along with the prescribed fee to the Registrar (Evaluation) within 10 days after the announcement of the results. This challenge valuation is only for SEE.

   The answer scripts for which challenge valuation is sought for shall be evaluated by the external examiner who has not involved in the first evaluation. The higher of two marks from first valuation and challenge valuation shall be the final.

b. With regard to any specific case of ambiguity and unsolved problem, the decision of the Vice-Chancellor shall be final.

**Mapping of PEOs with Respect to POs**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---|---|---|---|---|---|---|---|---|
| PE01 | √ | √ | √ | √ | √ | √ | √ | √ |
| PE02 | √ | √ | √ | √ | √ | √ | √ | √ |
| PE03 | √ | √ | √ | √ | √ | √ | √ | √ |
| PE04 | √ | √ | √ | √ | √ | √ | √ | √ |

**Attainment of CO (Course Outcome)**

| CO Attainment | Value |
|---|---|
| 0.4 - 0.6 | 1 |
| 0.6 – 0.75 | 2 |
| > 0.75 | 3 |

## Mapping of Course Outcomes with Programme Outcomes

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PS1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0101 | CO1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| | CO2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 |
| | CO3 | 1 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 1 | 2 |
| | CO4 | 3 | 3 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 0 | 2 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0102 | CO1 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 1 | 2 |
| | CO2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 2 | 1 |
| | CO3 | 2 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 1 | 1 | 2 |
| | CO4 | 3 | 3 | 2 | 3 | 1 | 1 | 3 | 2 | 2 | 1 | 1 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0103 | CO1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| | CO2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 |
| | CO3 | 1 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 1 | 2 |
| | CO4 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0104 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0105 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0106 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0107 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23AHE101 | CO1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 |
| | CO3 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 2 | - | - | - |
| | CO4 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | - | - | - |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | P7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0201 | CO1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| | CO2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 |
| | CO3 | 1 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 1 | 2 |
| | CO4 | 3 | 3 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 0 | 2 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0202 | CO1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 2 |
| | CO2 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 |
| | CO3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| | CO4 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0203 | CO1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 2 |
| | CO2 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 |
| | CO3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| | CO4 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0204 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

| Course Code | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23AH0705 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0205 | CO1 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| Coursecode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22LHM201 | CO1 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 1 | -- | -- | -- | 1 | 1 | 1 | 1 | 2 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22AS0207 | CO1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 2 |
| | CO2 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 |
| | CO3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| | CO4 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0206 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0207 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0208 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0301 | CO1 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0302 | CO1 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 1 |
| | CO2 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0303 | CO1 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CO2 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |
| | CO3 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 1 |
| | CO4 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0304 | CO1 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| | CO3 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 2 | 2 | 2 | 2 |
| | CO4 | 3 | 3 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 1 |

| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0305 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 1 | 3 | 2 | 1 | 3 | 1 | 3 | 1 | 2 | 2 | 3 |
| | CO4 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 3 | 1 | 3 | 3 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23AH0801 | CO1 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PS O2 | PSO3 |
| B22HE0306 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0307 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0308 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0309 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0310 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0401 | CO1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| | CO2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 |
| CourseCode | POS/ COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0402 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CourseCode | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0403 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 |
| | CO4 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 |

| CourseCode | POS/ COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0404 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 |
| | CO4 | 3 | 1 | 2 | 2 | 3 | 2 | 3 | 1 | 1 | 3 | 2 |
| CourseCode | POS/ COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0405 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 2 | 2 | 2 | 2 |
| | CO4 | 3 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 3 |
| CourseCode | POS/ COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HES411 | CO1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 3 |
| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HES412 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HES406 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HES407 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HES408 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HES409 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| Course Code | POS/ COS | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0501 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CourseCode | POS/ COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0502 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 2 |
| | CO4 | 2 | 3 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 2 | 2 |

| Course Code | POS/ COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0503 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 1 | 2 |
| | CO4 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 3 | 2 |
| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0504 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 1 | 3 | 2 | 2 |
| | CO4 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| Course Code | POS/ COs | PO1 | P0 2 | PO3 | PO 4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0505 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO4 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 1 | 2 |
| Course Code | POS/ COs | PO1 | P0 2 | PO3 | PO 4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0506 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 3 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO4 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Course Code | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0507 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| Course Code | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0508 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| Course Code | POS/ | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| B22HE0509 | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| Course Code | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0510 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| Course Code | POS/ COs | PO1 | P0 2 | PO3 | PO 4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0601 | CO1 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| Course Code | POS/ COS | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0602 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 |
| | CO4 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 |

| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0603 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 2 |
| | CO4 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0604 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 1 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| | CO4 | 2 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 3 |
| Course Code | POS/ COS | PO1 | P0 2 | PO3 | PO4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0605 | CO1 | 2 | 3 | 3 | 3 | 1 | 2 | 3 | 1 | 3 | 1 | 1 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0606 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B23HE0607 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0608 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0609 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0610 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0701 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 3 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 |
| | CO4 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0702 | CO1 | 2 | 1 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 1 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| | CO3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 1 |
| | CO4 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 1 | 3 | 3 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0703 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 2 | 2 | 1 | 2 |
| | CO4 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 2 | 3 |

| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0704 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| | CO4 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0706 | CO1 | 1 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0707 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0708 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0709 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0801 | CO1 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| | CO3 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 2 |
| | CO4 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22HE0802 | CO1 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 2 | 2 | 2 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| | CO3 | 2 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 2 | 2 | 3 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CO4 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22AH0803 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22AH0804 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | P0 2 | PO3 | PO 4 | PO 5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22AH0805 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| | CO3 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO4 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
| B22AH0806 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |

## Mapping of PEOs with Respect to PO's

| | PO1 | PO 2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PEO1 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PEO2 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PEO3 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| PEO4 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |

## Bachelor of Physiotherapy (Effective from the Academic Year 2023-27)

**Duration: 4 Years + 6 months Internship** **Total semester: 8 Semesters**

### Program Scheme

HC = Hard Course | SC= Soft core | AEC= Ability Enhancement Course | OE=Open elective

MC = Mandatory Course | L- Lecture | T- Tutorial | P- Practicals | C- Credits

| Sl.No | Course code | Course title | Coursetype | Credit pattern | | | | Weekly contacthours | Teaching school/dept |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | | |
| **I SEMESTER** | | | | | | | | | |
| 1 | B23HE0101 | Human Anatomy-I | HC | 2 | 1 | 0 | 3 | 4 | Allied Health Sciences |
| 2 | B23HE0102 | Human Physiology-I | HC | 2 | 1 | 0 | 3 | 4 | Allied health Sciences |
| 3 | B23HE0103 | Biochemistry-I | HC | 2 | 1 | 0 | 3 | 3 | Allied health Sciences |
| 4 | B23HE0104 | Basic Kinesiology-I | HC | 2 | 0 | 0 | 2 | 2 | Allied health sciences |
| 5 | B23AHE101 | Language: Communicative English | AEC | 3 | 0 | 0 | 3 | 3 | Arts & Humanities |
| | | **Practicals** | | | | | | | |
| 6 | B23HE0105 | Practical: Human Anatomy lab-I | HC | 0 | 0 | 2 | 2 | 3 | Allied health sciences |
| 7 | B23HE0106 | Practical: Human Physiology lab-I | HC | 0 | 0 | 2 | 2 | 3 | Allied health sciences |
| 8 | B23HE0107 | Practical: Orientation to Physiotherapy | HC | 0 | 0 | 2 | 2 | 3 | Allied health sciences |
| **Total Credits for the I Semester:** | | | | | | | **20** | **24** | |

| Sl.No | Course code | Course title | Course type | Credit pattern | | | | Weekly contact hours | Teaching school/dept |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | | |
| **II SEMESTER** | | | | | | | | | |
| 1 | B23HE0201 | Human Anatomy II | HC | 2 | 1 | 0 | 3 | 4 | Allied Health Sciences |
| 2 | B23HE0202 | Human Physiology II | HC | 2 | 1 | 0 | 3 | 4 | Allied Health Sciences |
| 3 | B23HE0203 | Biochemistry-II | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 4 | B23HE0204 | Basic Kinesiology-II | HC | 2 | 0 | 0 | 2 | 2 | Allied Health Sciences |
| 5 | B23AH0705 | Sociology | HC | 2 | 0 | 0 | 2 | 2 | Allied Health Sciences |
| 6 | B22HE0205 | Biophysics &Basic Electrotherapy | HC | 2 | 0 | 0 | 2 | 2 | Allied Health Sciences |
| 7 | B22LHM201 | Constitution Of India & Professional Ethics | MC | 2 | 0 | 0 | 2 | 2 | Legal studies |
| 8 | B22AS0207 | Tree Plantation in Tropical Region: Benefits and Strategic Planning | FC | 1 | 0 | 0 | 1 | 1 | Allied Health Sciences |
| | | **Practicals** | | | | | | | |
| 9 | B23HE0206 | Practical: Human Anatomy lab II | HC | 0 | 0 | 2 | 2 | 3 | Allied Health sciences |
| 10 | B23HE0207 | Practical: Human Physiology lab II | HC | 0 | 0 | 2 | 2 | 3 | Allied Health sciences |
| 11 | B23HE0208 | Practical: Basic Kinesiology-II | HC | 0 | 0 | 2 | 2 | 3 | Allied Health sciences |
| **Total Credits for the II Semester:** | | | | | | | **24** | **29** | |

| Sl.No | Course code | Course title | Course type | Credit pattern | | | | Weekly contact hours | Teaching school/dept |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | | |
| **III SEMESTER** | | | | | | | | | |
| 1 | B22HE0301 | Pathology-I | HC | 2 | 0 | 0 | 2 | 2 | AlliedHealth sciences |
| 2 | B22HE0302 | Microbiology-I | HC | 2 | 0 | 0 | 2 | 2 | AlliedHealth Sciences |
| 3 | B22HE0303 | Biomechanics-I | HC | 2 | 1 | 0 | 3 | 3 | AlliedHealth Sciences |
| 4 | B22HE0304 | Exercise therapy-I | HC | 2 | 1 | 0 | 3 | 3 | AlliedHealth Sciences |
| 5 | B22HE0305 | Electrotherapy-I | HC | 2 | 1 | 0 | 3 | 3 | AlliedHealth Sciences |
| 6 | B23AH0801 | Psychology | HC | 2 | 0 | 0 | 2 | 2 | Arts & Humanities |
| 7 | B22HE0306 | Basic Nursing & First aid | HC | 2 | 0 | 0 | 2 | 2 | AlliedHealth Sciences |
| | | **Practicals** | | | | | | | |
| 8 | B22HE0307 | Practicals: Biomechanics-I | HC | 0 | 0 | 2 | 2 | 3 | AlliedHealth Sciences |
| 9 | B22HE0308 | Practical: Exercise therapy-I | HC | 0 | 0 | 2 | 2 | 3 | AlliedHealth sciences |
| 10 | B22HE0309 | Practical: Electrotherapy-I | HC | 0 | 0 | 2 | 2 | 3 | AlliedHealth Sciences |
| 11 | B22HE0310 | Clinical postings-I | HC | 0 | 0 | 3 | 3 | 3 | AlliedHealth sciences |
| **Total Credits for the III Semester:** | | | | | | | **26** | **32** | |

| Sl.No | Coursecode | Course title | Course type | Credit pattern | | | | Weekly contact hours | Teaching school/dept |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | | |
| **IV SEMESTER** | | | | | | | | | |
| 1 | B22HE0401 | Pathology-II | HC | 2 | 0 | 0 | 2 | 2 | Allied Health Sciences |
| 2 | B22HE0402 | Microbiology-II | HC | 2 | 0 | 0 | 2 | 2 | Allied Health Sciences |
| 3 | B22HE0403 | Biomechanics- II | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 4 | B22HE0404 | Exercise therapy II | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 5 | B22HE0405 | Electrotherapy II | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 6 | B22HES411 | Basics of Radiology | SC | 2 | 0 | 0 | 2 | 2 | Allied Health Sciences |
| | B22HES412 | Food & Nutrition | | | | | | | |
| | | **Practicals** | | | | | | | |
| 7 | B23HE0406 | Practical: Biomechanics-II | HC | 0 | 0 | 2 | 2 | 3 | Allied Health Sciences |
| 8 | B22HE0407 | Practical: Exercise therapy-II | HC | 0 | 0 | 2 | 2 | 3 | Allied Health Sciences |
| 9 | B22HE0408 | Practical: Electrotherapy-II | HC | 0 | 0 | 2 | 2 | 3 | Allied Health Sciences |
| 10 | B22HE0409 | Clinical postings-II | HC | 0 | 0 | 3 | 3 | 3 | Allied Health Sciences |
| **Total Credits for the IV Semester:** | | | | | | | **24** | **27** | |

| Sl.No | Course code | Course title | Course type | Credit pattern | | | | Weekly contact hours | Teaching school/dept |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | | |
| **V SEMESTER** | | | | | | | | | |
| 1 | B22HE0501 | Pharmacology-I | HC | 2 | 0 | 0 | 2 | 2 | Allied Health Sciences |
| 2 | B23HE0502 | Cardio Respiratory Physiotherapy-I | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 3 | B22HE0503 | Physiotherapy in Musculo Skeletal & Sports-I | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 4 | B22HE0504 | Clinical Orthopaedics | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 5 | B22HE0505 | General Medicine | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 6 | B23HE0506 | Cardio Respiratory & General conditions | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| | | **Practicals** | | | | | | | |
| 7 | B22HE0507 | Practical: Fundamentals of Yoga | HC | 0 | 0 | 2 | 2 | 3 | Allied Health Sciences |
| 8 | B23HE0508 | Practical: Cardio Respiratory Physiotherapy-I | HC | 0 | 0 | 2 | 2 | 3 | Allied Health Sciences |
| 9 | B22HE0509 | Practical: Physiotherapy in Musculo skeletal & Sports-I | HC | 0 | 0 | 2 | 2 | 3 | Allied Health Sciences |
| 10 | B22HE0510 | Clinical postings-III | HC | 0 | 0 | 3 | 3 | 3 | Allied Health Sciences |
| **Total Credits for the V Semester:** | | | | | | | **26** | **29** | |

| Sl. No | Course code | Course title | Course typ | Credit pattern | | | | Weekly contact hours | Teaching school/dept |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | | |
| **VI SEMESTER** | | | | | | | | | |
| 1 | B22HE0601 | Pharmacology-II | HC | 2 | 0 | 0 | 2 | 2 | Allied Sciences Health |
| 2 | B23HE0602 | Cardio Respiratory Physiotherapy-II | HC | 2 | 1 | 0 | 3 | 3 | Allied Sciences Health |
| 3 | B22HE0603 | Physiotherapy in Musculo skeletal & Sports-II | HC | 2 | 1 | 0 | 3 | 3 | Allied Sciences Health |
| 4 | B22HE0604 | General Surgery | HC | 2 | 1 | 0 | 3 | 3 | Allied Sciences Health |
| 5 | B22HE0605 | Biostatistics & Research | HC | 2 | 0 | 0 | 2 | 2 | Allied Sciences Health |
| 6 | B23HE0606 | Ethics, Administration and Education | HC | 1 | 1 | 0 | 2 | 2 | Allied Sciences Health |
| | | **Practicals** | | | | | | | |
| 7 | B23HE0607 | Practical: Cardio Respiratory Physiotherapy - II | HC | 0 | 0 | 2 | 2 | 3 | Allied Sciences Health |
| 8 | B22HE0608 | Practical: Physiotherapy in Musculo skeletal &Sports-II | HC | 0 | 0 | 2 | 2 | 3 | Allied Sciences Health |
| 9 | B22HE0609 | Practical: Physical education | HC | 0 | 0 | 2 | 2 | 3 | Allied Sciences Health |
| 10 | B22HE0610 | Clinical postings-IV | HC | 0 | 0 | 3 | 3 | 3 | Allied Sciences Health |
| **Total Credits for the VI Semester:** | | | | | | | **24** | **27** | |

| Sl.No | Course code | Course title | Course type | Credit pattern | | | | Weekly contact hours | Teaching school/dept |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | | |
| **VII SEMESTER** | | | | | | | | | |
| 1 | B22HE0701 | Physiotherapy in Neurology & Paediatrics-I | HC | 2 | 1 | 0 | 3 | 4 | Allied Sciences Health |
| 2 | B22HE0702 | Community Physiotherapy-I | HC | 2 | 1 | 0 | 3 | 4 | Allied Sciences Health |
| 3 | B22HE0703 | Community Medicine | HC | 2 | 1 | 0 | 3 | 3 | Allied Sciences Health |
| 4 | B22HE0704 | Clinical Neurology & Paediatrics | HC | 2 | 1 | 0 | 3 | 3 | Allied Sciences Health |
| 5 | B22HE0706 | Evidence Based Practice | HC | 2 | 0 | 0 | 2 | 2 | Allied Sciences Health |
| | | **Practicals** | | | | | | | |
| 6 | B22HE0707 | Practical: Physiotherapyin Neurology & Paediatrics-I | HC | 0 | 0 | 2 | 2 | 3 | Allied Sciences Health |
| 7 | B22HE0708 | Practical: Community Physiotherapy-I | HC | 0 | 0 | 2 | 2 | 3 | Allied Sciences Health |
| 8 | B22HE0709 | Clinical postings-V | HC | 0 | 0 | 3 | 3 | 3 | Allied Sciences Health |
| **Total Credits for the VII Semester:** | | | | | | | **21** | **25** | |

| Sl.No | Course code | Course title | Course type | Credit pattern | | | | Weekly contact hours | Teaching school/dept |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | | |
| **VIII SEMESTER** | | | | | | | | | |
| 1 | B22HE0801 | Physiotherapy in Neurology & Paediatrics-II | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| 2 | B22HE0802 | Community Physiotherapy-II | HC | 2 | 1 | 0 | 3 | 3 | Allied Health Sciences |
| | | **Practicals** | | | | | | | |
| 3 | B22HE0803 | Practical: Physiotherapy in Neurology & Paediatrics-II | HC | 0 | 0 | 2 | 2 | 3 | Allied Health Sciences |
| 4 | B22HE0804 | Practical: Community Physiotherapy-II | HC | 0 | 0 | 2 | 2 | 3 | Allied Health Sciences |
| 5 | B22HE0805 | Project work | HC | 0 | 0 | 4 | 4 | 6 | Allied Health Sciences |
| 6 | B22HE0806 | Clinical postings-VI | HC | 0 | 0 | 3 | 3 | 3 | Allied Health Sciences |
| **Total Credits for the VIII Semester:** | | | | | | | **17** | **24** | |

**Total credits for all 8 semesters – 182**

| **INTERNSHIP** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Course Code** | **Course Title** | **Course Type** | **Credit Pattern and Value** | | | | **Weekly Contact hours** | **Teaching School/Dept.** |
| | | | **L** | **T** | **P** | **C** | | |
| B23HE0901 | Internship | HC | 0 | 0 | 24 | 24 | 48 | Allied Health Sciences |

**Duration: 6 Months or 180 working days**

**Total Clinical Hrs: 1440**

**Credits: 24**

**Total credits for all 8 semesters and 6 months internship - 206 credits**

## I SEMESTER

| Course code B23AHE101 | COMMUNICATIVE ENGLISH | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **3** | **0** | **0** | **3** |

**Pre-requisites**

The student must have knowledge of intermediate English Grammar and LSRW skills.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To enhance functional communication skills.
2. To develop functional use of language in professional contexts.
3. To utilize oral presentations in multiple contexts.
4. To apply effective written skills in formal communication.

**Course Outcomes**

1. **CO1**-Identify pressing issues relating to society, environment and media.
2. **CO2**-Develop a process-oriented approach to writing.
3. **CO3**-Apply the grammatical skills developed during the course aptly.
4. **CO4**-Demonstrate a good command over language usage and refined interpersonal skills.

### Mapping of Course Outcomes with Programme Outcomes

| Course Code | POS/ Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23AHE101 | CO1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 |
| | CO3 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 2 | - | - | - |
| | CO4 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | - | - | - |

**Course Contents: 40 Hours**

**Course Description**

This course focuses on improving the spoken and written communication of the learners. The course develops personal, inter-personal and group skills among learners. It also addresses the functional aspects of language usage while providing specific linguistic tools through professional language learning software. The widespread reach of this course makes it highly practical and applicable

## UNIT-I

### Remedial Grammar: The Present Tense

1. Present Simple
2. Present Continuous
3. Present Perfect
4. Present Perfect continuous

### Writing Skills: Official Letters

1. Apology Letter
2. Complaint Letter
3. Letter of Enquiry: (Internship, Fellowship, Job Options)

**Literature**: Jyoti Lanjewar - Mother

## UNIT-II

### Remedial Grammar: The Past Tense

1. Past Simple
2. Past Continuous
3. Past Perfect
4. Past Perfect continuous

### Writing Skills: Essays:

1. Descriptive Essay
2. Narrative Essay
3. Compare and contrast Essay
4. Argumentative Essay

**Literature**: Nissim Ezekiel – Poet, Lover and Bird Watcher

## UNIT-III

### Remedial Grammar: The Future Tense

1. Future Simple

2. Future Continuous
3. Future Perfect
4. Future Perfect continuous

**Writing Skills:**

1. Note Making
2. Note Taking
3. Precis writing

**Literature**: Sadaat Hasan Manto – Toba Tek Singh

**UNIT-IV**

**Remedial Grammar:**

1. Prepositions of Place and Time
2. Collocations
3. Idioms and Phrases

**Writing Skills**: Comprehension (Unseen Passages followed by questions)

**Literature**: R K Narayan – A Horse and Two Goats

**Recommended Textbooks:**


1. Green, David. Contemporary English Grammar Structures and Composition. MacMillan, 2010.
2. Thorpe, Edgar and Showick Thorpe. Basic Vocabulary. Pearson Education India, 2012.
3. Leech, Geoffrey and Jan Svartviks. A Communicative Grammar of English. Longman, 2003.
4. Murphy, Raymond. Murphy's English Grammar with CD. Cambridge University Press, 2004.
5. Rizvi, M. Ashraf. Effective Technical Communication. Tata McGraw-Hill, 2005.
6. Riordan, Daniel. Technical Communication. New Delhi: Cengage Publications, 2011.
7. Sen et al. Communication and Language Skills. Cambridge University Press, 2015.

| Course code B23HE0101 | HUMAN ANATOMY-I | L | T | P | C |
|---|---|---|---|---|---|
| Duration: 4 hrs. /week | | 2 | 1 | 0 | 3 |

**Pre-requisites**

Students on Completion of study of basic principles of cross-sectional normal anatomy of human body tissue.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the organization of human body, cell and genetics
2. To obtain knowledge regarding the structural organization of skeletal system
3. To understand the structure and functions of muscular system and sense organs
4. To interpret the importance of nervous system and endocrine system

**Course Outcomes**

1. CO1. Ready to explain the organization of components in the Human Body
2. CO2. Able to understand the structural compositions in skeletal system
3. CO3. To get knowledge about the structure and functions of muscular system and sense organs
4. CO4. Able to analyze the nervous system and endocrine system

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COS | PO1 | P2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0101 | CO1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| | CO2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 |
| | CO3 | 1 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 1 | 2 |
| | CO4 | 3 | 3 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 0 | 2 |

**Course Contents: 48 Hours**

**Course Description**

The study of anatomy will include identification of all gross anatomical structures. Particular emphasis will be placed on description of bones, joints, muscles, brain, cardio-pulmonary and nervous system as these are related to the application of physiotherapy patients.

## UNIT -I

GENERAL ANATOMY

### HISTOLOGY

General Histology, study of the basic tissues of the body; Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone, Muscular tissue, Nerve Tissue – TS & LS

Circulatory system – large sized artery, medium sized artery, and large sized vein

Lymphoid tissue

### EMBRYOLOGY

Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations.

Development of skin, Fascia, blood vessels, lymphatic,

Development of bones, axial and appendicular skeleton and muscles,

Neural tube, brain vessels and spinal cord,

Development of brain and brain stem structures.

### HEAD AND NECK

Osteology: Mandible and bones of the skull.

Soft parts: Muscles of the face and neck and their nerve and blood supply-extraocular muscles, triangles of the neck

## UNIT -II

### THORAX AND ABDOMEN

Osteology of vertebral column

Identify and classify vertebrae – typical & atypical

Parts and features of typical vertebrae

Features of thoracic, lumbar, sacral, coccyx.

Intervertebral joint – articulating surface, movements, stability, mobility

Curvatures of vertebral column.

Contents of vertebral canal.

Sternum – parts, features (borders, surfaces, muscle attachments)

Define true, false, floating ribs

Mention parts and features of atypical rib.

Type and formation of joint between rib and vertebrae, between costal cartilage, costal cartilage and sternum, between parts of sternum.

Sternal angle.

Intercostal space and its contents.

Intercostal nerve – course and its branches.

Intercostal muscle – origin, insertion, nerve supply, action.

Diaphragm – origin, insertion, nerve supply, action, orifice, structures passing through diaphragm.

Movements of ribs – pump handle and bucket handle movement.

## PELVIS

Formation and subdivision of bony pelvis

List features of male and female bony pelvis

Type, articular surface, ligaments, movements of joints of pelvis

Abdominal cavity and layers of abdominal wall (ant & post), (O, I, NS, ACT)

Rectus sheath

Inguinal canal (position, extent, formation, content)

Branches and distribution of abdominal aorta and iliac arteries

Mention features of pubic symphysis and sacroiliac joint

Muscles of pelvic floor (attachment, action, nerve supply)

Structures of urogenital diaphragm

## UNIT -III

## OSTEOLOGY

Identify parts, borders, surfaces, attachments of bones– clavicle, scapula, humerus, radius, ulna, carpal bones, Meta carpal, phalanges.

## ARTHROLOGY

Type, articular surface, muscle, ligaments, movements blood supply, nerve supply of joints- Sternoclavicular, acromioclavicular, shoulder, elbow, radio ulnar, IP, MCP, CMC

## MYOLOGY

Identify muscles – origin, insertion, nerve supply and action of muscles of scapula, upper arm and lower arm

## NEUROLOGY

Identify nerves of upper limb and its origin, course, division, innervations, Relation, its applied anatomy of radial nerve, median nerve, ulnar nerve, Axillary nerve, musculocutaneous nerve. Brachial plexus – formation and root values. Dermatome of UL.

**ANGIOLOGY**

Distribution of blood vessels, lymph nodes, main arteries and veins of UL - Axillary, brachial, radial, Ulnar arteries.

**AXILLA**

Identify boundaries, contents of axilla, branches of axillary artery and its relation.

Scapulothoracic rhythm

Cubital fossa – Boundaries, contents, relation.

**UNIT -IV**

**OSTEOLOGY**

Identify parts, border, surface, attachments of bones – hip bone, femur, tibia, Fibula, patella, tarsal bones, Meta tarsal bones, phalanges

**ARTHROLOGY**

Type, articular surface, muscle, ligaments, movements, blood supply, nerve supply, of Joints – hip, knee, tibiofibular, tarsal

**MYOLOGY**

Identify origin, insertion, nerve supply, action of muscles of – thigh, leg and sole of foot

**NEUROLOGY**

Identify plexuses, nerves of LL, origin, course, innervations, applied anatomy, Relation of Femoral nerve, sciatic nerve, tibial nerve, common peroneal nerve, Obturator nerve, superficial and deep peroneal nerve.

Lumbar plexuses, sacral plexuses.

**ANGIOLOGY**

Distribution of blood vessels, lymph node of LL, main arteries and veins of LL –

Femoral artery, femoral vein, tibial artery, posterior tibial artery, femoral triangle, Popliteal Fossa – boundaries and contents.

Arches of foot.

**Recommended Text books:**

1.SNELL [ Richard S], Clinical Anatomy for Medical students: Ed. 5. Little Brown and Company Boston.1995, p898, $26.50

2. B.D Chaurasia's Human Anatomy – Regional and Applied; Volume I, Volume II and Volume III.
3. MOORIE [Kieth L], Clinically Oriented Anatomy. Ed.3., Williams and Wilkins, Baltimore, 1992, p917,
4.DATTA [A.K], Essentials of human Anatomy: Thorax and Abdomen Ed 2. Vol. I Current Book International, Calcutta 1994, p433, Rs. 200/-DATTA [A.K], Essentials of human Anatomy: Head and Neck Ed 2. Vol. II.
5.Current Book International, Calcutta 1995, p363, Rs. 150/-5. SINGH [Inderbir], Text book of Anatomy with colour atlas: Introduction, Osteology, Upper Extremity, Lower Extremity. Vol I. P Brothers, New Delhi 1996.
6.SINGH [Inderbir], Text book of Anatomy with colour Atlas: Thorax and Abdomen. Vol II. J P Brothers, New Delhi 1996.
7.SINGH [Inderbir], Text book of Anatomy with colour Atlas: Head and Neck Central Nervous System. Vol III. J P Brothers, New Delhi 1996, Rs. 175/-
8.SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990, p 191, Rs. 50/-

| Course code B23HE0102 | HUMAN PHYSIOLOGY-I | L | T | P | C |
|---|---|---|---|---|---|
| Duration: 4 hrs/week | | 2 | 1 | 0 | 3 |

**Pre-requisites**

Students on Completion of study of basic principles of cross-sectional normal anatomy of human body tissue.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To know about the cardiovascular system, cardiac cycle, blood pressure and heart rate and ECG.
2. To know about nerve cell and nervous system, nerve impulse, EEG and about sense organs.
3. To understand the endocrine system and sense organs.

**Course Outcomes**

1. **CO1**. Achieve knowledge about blood cell, blood component, lymphatic system and related lab technique
2. **CO2**. Able to understand cardio vascular system, cardiac cycle, blood pressure & heart rate and ECG measurement
3. **CO3**. Able to understand nerve cell & nervous system, nerve impulse, EEG and about the sense organ.
4. **CO4**. Ready to understand the endocrine system and sense organs

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS / COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0102 | CO1 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 1 | 2 |
| | CO2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 2 | 1 |
| | CO3 | 2 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 1 | 1 | 2 |
| | CO4 | 3 | 3 | 2 | 3 | 1 | 1 | 3 | 2 | 2 | 1 | 1 |

**Course Contents: 48 Hours**

## Course Description

This course which runs concurrently with the anatomy course helps the student to understand the basis of normal human physiology with special emphasis on the Functioning of the cardiovascular, musculoskeletal, nervous system and Respiratory system.

### UNIT – I

**General Physiology**: Cell: morphology, Structure and function of cell organelles structure of cell membrane, transport across cell membrane Intercellular communication Homeostasis, Body Fluids- Distribution and composition

Nerve Muscle Physiology: Muscles- classification, structure, properties, Excitation contraction coupling Motor unit, EMG, factors affecting muscle tension, Muscle tone, fatigue, exercise Nerve – structure and function of neurons, classification, properties Resting membrane potential & Action potential their ionic basis.

All or None phenomenon Neuromuscular transmission Ionic basis of nerve conduction Concept of nerve injury & Wallerian degeneration Synapses Electrical events in postsynaptic neurons Inhibition & facilitation at synapses Chemical transmission of synaptic activity Principal neurotransmitters.

### UNIT – II

Blood: Introduction-composition & function of blood W.B.C., R.B.C, platelets formation & functions, Immunity, Plasma: composition, formation & functions, Plasma Proteins: -types & functions Blood Groups- types, significance, determination Haemoglobin, Haemostasis Lymph- composition, formation, circulation &functions.

Structure of muscle – Macroscopic & Microscopic (Myofibril, Myoneural junction)

Properties of skeletal muscle

Cardiac and smooth muscle

Chemical process involved in muscle contraction

Motor unit, EMG

Effect of exercise on muscular system

Exercise metabolism– O2 dept, respiratory quotient

## UNIT-III

## REPRODUCTION

Male reproductive system

Female reproductive system

Pregnancy, function of placenta, parturition, lactation, contraception

Puberty and Menopause

Spermatogenesis and Oogenesis

Menstrual cycle

## ENDOCRINE

General organization of endocrine glands

General metabolism – Carbohydrate, Fat, Protein

## UNIT-IV

Special Senses: Vision: Cross-section of eye, Functions of aqueous humour, Visual pathway, visual filed defects, Accommodation to near vision, light reflex, refractory errors of the eye, Visual acuity

Hearing: Structure and functions of external, middle and inner ear, Mechanism of hearing, Vestibular apparatus: Parts and function, Receptors for taste and smell sensations

Cardiovascular system: Cardiac Muscles, conducting system-components, impulse conduction

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

| Course code B23HE0103 | BIOCHEMISTRY-I | L | T | P | C |
|---|---|---|---|---|---|
| Duration: 3 hrs./week | | 2 | 1 | 0 | 3 |

**Pre-requisites**

Students on Completion of study of basic principles of Human organs and systems functions.

To know about blood cell, blood component, lymphatic system and related lab technique.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To acquire knowledge on structure and functions of cell.
2. To know about the functions of components of food, enzymes.
3. To learn about the Basal metabolic rate, nutritional aspects of carbohydrates, lipids, proteins, vitamins.
4. To learn about clinical biochemistry.

**Course Outcomes**

1. **C01**-Describe structures & functions of cell in brief.
2. **CO2**-Describe normal functions of different components of food, enzymes
3. **CO3**-Describe what is basal metabolic rate & factors affecting the same, with special reference to obesity.
4. **CO4**-Define enzymes; discuss in brief, factors affecting enzyme activity.

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0103 | CO1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| | CO2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 |
| | CO3 | 1 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 1 | 2 |
| | CO4 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 |

**Course Contents: 48 Hours**

## Course Description

### UNIT -I

### Chemistry of Carbohydrate:

Carbohydrates Classification of Carbohydrate - structure, occurrence, properties and biological functions. Homoglycans - structure and biological functions. Heteroglycans and complex carbohydrates: Structure, and biological function. Mucopolysaccharides – bacterial cell wall polysaccharides and sialic acid. Lectins – characteristics and uses, Blood group antigens, Major classes of glycoproteins: O-linked and N- linked oligosaccharides.

Digestion, absorption, transportation, utilization and storage of carbohydrates.

### UNIT- II

### Chemistry of Lipids:

Lipids: Classification of lipids. Saturated and unsaturated fatty acids. Derived lipids: Phospholipids, glycolipids, structure and function. Eicosanoids- structure and biological actions of prostaglandins, prostacyclins, thromboxanes, leukotrienes and lipoxins. Lipoproteins- Classification and composition. Amphipathic lipids – membranes, micelles, emulsions and liposomes.

Digestion, absorption, transportation, utilization and storage of lipids

### UNIT- III

### Chemistry of Proteins & Enzyme

Proteins Amino acids: Chemistry-definition-function-classification of Amino acids-protein structure-effect of temperature on proteins- denaturation-coagulation; isoelectric pH & its importance biologically important peptides. peptide bond, peptides. Primary structure and its determination. The Ramachandran plot and cross links. Secondary structure: The α-helix, β-sheets and Corey model for fibrous proteins, super secondary structures - Zinc motifs, Leucine zipper motif. Tertiary structure - Collagen and quaternary structure – Haemoglobin.

Digestion, absorption, transportation, utilization and storage of Proteins. Nucleic Acids of nucleic acids, Structure of dsDNA – Watson and Crick model of DNA Properties of DNA – denaturation, renaturation, Major and Minor classes of RNA- mRNA, t RNA, rRNA, hn RNA.

### UNIT- IV

### Chemistry of Vitamins & Minerals

Water soluble vitamins - thiamine, riboflavin, niacin, pyridoxine, folic acid, ascorbic acid sources, structure, biochemical functions, deficiency diseases, daily requirements. Fat soluble - vitamin A, vitamin D2, vitamin E and vitamin K - sources, structure, biochemical functions, deficiency diseases, daily requirements and hypervitaminosis

Macro Minerals- Calcium and Phosphorous: Functions, requirements, sources and effects of deficiency.

Micro minerals- Iron, Iodine, Copper, Fluorine and Zinc: Functions, sources, requirements and effects of deficiency. Sodium and Potassium: Functions, sources, requirements and effects of imbalances.

Vitamins and Porphyrins. Porphyrins the porphyrin ring system

**Recommended Text books**


1. U Satyanarayan,(2008), Essentials of Biochemistry,2nd edition, Standard Publishers
2. S. Ramakrishnan, K G Prasannan and R Rajan: Text book of Medical Biochemistry, Orient Longman, Madras, 1990
3. D.R. Whikehart: Biochemistry of the Eye, 2nd edition, Butterworth Heinemann, Pennsylvania, 2003
4. D M Vasudevan, (2011),Text book of Medical Biochemistry,6th edition Jaypee Publishers
5. M N Chatterjea & Rana Shind,Text book of Medical Biochemistry, Jayppe Publications
6. Singh & Sahni,(2008),Introductory Practical Biochemistry,2nd edition, Alpha Science

| Course code: B23HE0104 | BASIC KINESIOLOGY-I | L | T | P | C |
|---|---|---|---|---|---|
| Duration: 2 hrs./ week | | 2 | 0 | 0 | 2 |

**Pre-requisites**

Students on Completion of study of basic principles of Kinesiology.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Aims at introducing the students to the basic concepts of kinesiology.

**Course Outcomes**

1. **CO1**- Describe terminologies and concepts in mechanics, and interpret with respect to human body.
2. **CO2**- Describe basic concepts of joint structure and function.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0104 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 48 Hours**

## Course Description

### UNIT - I

MECHANICS

1. Types of motion, planes of motion, direction of motion and quantity of motion.
2. Forces, force vectors, components of forces, classification of forces, composition and resolution of forces, angle of pulls of muscle.

3. Gravity, segmental centers of gravity, center of gravity, and line of gravity of the human body, stability and center of gravity, relocation of the center of gravity. Reaction forces, Newton law of reaction.
4. Equilibrium- Supporting base, types, and equilibrium in static and dynamic state law of inertia and establishing equilibrium of an object.
5. Objects in motion: law of acceleration, joint distraction in a linear force system and force of friction.
6. Concurrent force system: composition of force, muscle action lines, total muscle force vector, divergent muscle pulls, and anatomical pulleys.
7. Pulleys - system of pulleys, types and application.
8. Work
9. Parallel force systems: first class lever, second class lever, third class lever – torque – mechanical advantage.
10. Moment arm: moment arm of a muscle force, moment arm of gravity and anatomical pulleys- types of pulleys: fixed and movable.

**UNIT - II**

JOINT STRUCTURE AND FUNCTION

1. Describe the basic principles of joint design and a human joint
2. Describe the tissue present in human joints: including dense fibrous tissue, bone, cartilage and connective tissue
3. Classify joints – synarthrosis, amphiarthrosis, diarthrosis, and sub classification of synovial joints
4. Describe joint function, range of motion and joint motion
5. Describe the general effects of injury, disease and immobilization
6. Kinetic chain description, closed kinematics chain versus open kinematics chain.
7. Ligament and tendon mechanics. - Structure, composition, and mechanical properties, Muscle tendon properties, Changes with aging, exercise and immobilization in ligaments and tendons
8. Bone mechanics - Structure, composition and mechanical properties, Changes with ageing, exercise, and immobilization in bones

**Recommended Text books**

1. Progressive resisted exercises – by Margaret Hollis.
2. Therapeutic Exercise by Carolyn Kisner.
3. Kinesiology by Cynthia Norkins
4. PNF – Knott and Voss
5. Therapeutic exercise by Basmijjan & Wolf.
6. Muscle testing by Daniel Kendall
7. Clinical evaluation – Lacote (for Isolated assessment of abdominal muscles)
8. Muscle stretching & Auto stretching – Olaf Evjenth
9. Orthopaedic Evaluation – Magee (only for assessment of posture)

| Course code- B23HE0105 | PRACTICAL HUMAN ANATOMY LAB-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on Completion of study of basic principles of cross-sectional normal anatomy of human body tissue.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the organization of human body, cell and genetics
2. To obtain knowledge regarding the structural organization of skeletal system

**Course Outcomes**

1. **CO1**. Ready to explain the organization of components in the Human Body
2. **CO2**. Able to understand the structural compositions in skeletal system

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0105 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

## Course Description

## List of Practical / Demonstrations

1. Thorax including surface anatomy, abdominal muscles joints
2. Histology-Elementary tissue including surface Anatomy
3. Embryology-models, charts & X-rays
4. Demonstration of the muscles of the whole body in a cadaver.
5. Demonstration of movements in important joints.

6. Identification of body prominences on inspection and by palpation especially of extremities.

7. Points of palpation of arteries.

**Recommended Text books:**

1.SNELL [ Richard S], Clinical Anatomy for Medical students: Ed. 5. Little Brown and Company Boston.1995, p898, $26.50

2. B.D Chaurasia's Human Anatomy – Regional and Applied; Volume I, Volume II and Volume III.

3. MOORIE [Kieth L], Clinically Oriented Anatomy. Ed.3., Williams and Wilkins, Baltimore, 1992, p917,

4.DATTA [A.K], Essentials of human Anatomy: Thorax and Abdomen Ed 2. Vol. I Current Book International, Calcutta 1994, p433, Rs. 200/-DATTA [A.K], Essentials of human Anatomy: Head and Neck Ed 2. Vol. II.

5.Current Book International, Calcutta 1995, p363, Rs. 150/-5. SINGH [Inderbir], Text book of Anatomy with colour atlas: Introduction, Osteology, Upper Extremity, Lower Extremity. Vol I. P Brothers, New Delhi 1996.

6.SINGH [Inderbir], Text book of Anatomy with colour Atlas: Thorax and Abdomen. Vol II. J P Brothers, New Delhi 1996.

7.SINGH [Inderbir], Text book of Anatomy with colour Atlas: Head and Neck Central Nervous System. Vol III. J P Brothers, New Delhi 1996, Rs. 175/-

8.SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990, p 191, Rs. 50/-

| Course code- B23HE0106 | PRACTICAL: HUMAN PHYSIOLOGY LAB-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on Completion of study of basic principles of normal physiology of human body tissue.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the physiology of human body, cell and genetics
2. To obtain knowledge regarding the physiological organization of human body

**Course Outcomes**

1. **CO1**. Ready to explain the physiology of the Human Body
2. **CO2**. Able to understand the physiological compositions in human body

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0106 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**Course Description**

1. Venous blood collection
2. Separation of blood components
3. Using centrifuge.
4. Identification of blood cells- permanent slides
5. ABO blood grouping
6. Reading of blood pressure using sphygmomanometer
7. Determination of bleeding time and clotting time.
8. Capillary blood collection and clotting time

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

| Course code- B23HE0107 | PRACTICAL: ORIENTATION TO PHYSIOTHERAPY | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on Completion of study of basic orientation to the field of physiotherapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the field of physiotherapy
2. To obtain knowledge regarding the scope of physiotherapy

**Course Outcomes**

1. **CO1**. Ready to explain the field of physiotherapy
2. **CO2**. Able to understand the scope of physiotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE107 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

## Course Description

## Course Description

Components of Physiotherapy Profession:

1. History of Medical Therapeutics
2. History of Physiotherapy
3. Overview of Health Science Professions

Role of Physiotherapy in meeting Health Care Needs in India.

1. Needs versus Demands

2. Physiotherapist as 'Educator'
3. Typical Job settings
4. Common problems and solutions

Basics about physiotherapy

1. Different modalities used in the physiotherapy field
2. Different opportunities of physiotherapy field in healthcare
3. Opportunities in Sports fields

**Recommended text books:**

1. WCPT GUIDELINES
2. IAP GUIDELINES
3. Clayton’s electrotherapy

## II SEMISTER

| Course code- B23HE0201 | HUMAN ANATOMY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 4 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Students on Completion of study of basic principles of cross-sectional normal anatomy of human body tissue.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

5. To understand the organization of human body, cell and genetics
6. To obtain knowledge regarding the structural organization of skeletal system
7. To understand the structure and functions of muscular system and sense organs
8. To interpret the importance of nervous system and endocrine system

**Course Outcomes**

5. **CO1**. Ready to explain the organization of components in the Human Body
6. **CO2**. Able to understand the structural compositions in skeletal system
7. **CO3**. To get knowledge about the structure and functions of muscular system and sense organs
8. **CO4**. Able to analyze the nervous system and endocrine system

### Mapping of Course Outcomes with Programme Outcomes

| Course Code | POS/ Cos | PO1 | PO 2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0201 | CO1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| | CO2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 |
| | CO3 | 1 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 1 | 2 |
| | CO4 | 3 | 3 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 0 | 2 |

**Course Contents: 48 Hours**

**Course Description**

## UNIT – I

## SYSTEMIC ANATOMY

### CARDIOVASCULAR SYSTEM

Normal position, external features of heart and parts of heart, internal features of chambers of heart, blood supply, venous supply, conductive system.

### GASTROINTESTINAL SYSTEM

The entire system of the GI including all the organs involved, about its anatomical position, parts, muscles and blood vessels involved, relations of each organ and its nervous supply.
This includes – Oral cavity, Pharynx, Stomach, Small Intestine, Large Intestine, Rectum & Anal canal. Digestive glands - Liver, Pancreas, Gall Bladder, Salivary glands
Large blood vessels of the gut. Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, intestines, gall bladder.

## UNIT - II

### RESPIRATORY SYSTEM

The entire system of the respiratory including all the organs about its anatomical position, Parts, Muscles and blood vessels involved, Relations of each organ and its nervous supply. The study about the organ, Nasal cavity, Larynx, Trachea, Thoracic cage, Diaphragm, Pleura and Lungs. Normal position, parts, relation, blood supply of URT & LRT, pleura and its reflection, nerve supply, Broncho pulmonary segment, mechanics of respiration.

### MALE REPRODUCTIVE SYSTEM

All the organs involved in male reproduction about its anatomical position, parts, muscles and blood vessels involved, Relations of each organ and its nervous supply. The organs are-testes, spermatic cord, Vas Deferens, prostate & penis.

## UNIT - III

### FEMALE REPRODUCTIVE SYSTEM

All the organs involved in female reproduction about its anatomical position, Parts, Muscles and blood vessels involved, relations of each organ and its nervous supply. The organs are-Uterus, Fallopian Tube and Ovaries.

## SPECIAL SENSES

The organs involved in special senses including Vision, Hearing & Balance, Olfaction, Taste and Skin & it appendages – Its parts, functions, blood and nerve
supply.

## ENDOCRINE SYSTEM

About all the glands including Pituitary, Thyroid, Parathyroid, Suprarenal – Its parts, positions, blood supply and lymphatic drainage.

## UNIT - IV

## NERVOUS SYSTEM

The study of Spinal Cord, Brain- All the parts, Functions and blood supply, Ventricles and Production of CSF along with its Circulation. Central Nervous system, Autonomic nervous system, Peripheral nervous system, cranial nerves

## URINARY SYSTEM

All the organs involved in excretion about its anatomical position, parts, Muscles and blood vessels involved, Relations of each organ and its nervous supply. The organs are Kidneys, Ureter, Urinary Bladder, Urethra- Both male and female. Position, parts, relation, blood supply, nerve supply, lymph drainage of kidney, ureter, urinary bladder, urethra. Innervations of urinary bladder.

**Recommended Text books:**

1.SNELL [ Richard S], Clinical Anatomy for Medical students: Ed. 5. Little Brown and Company Boston.1995, p898, $26.50

2. B.D Chaurasia's Human Anatomy – Regional and Applied; Volume I, Volume II and Volume III.

3. MOORIE [Kieth L], Clinically Oriented Anatomy. Ed.3., Williams and Wilkins, Baltimore, 1992, p917,

4.DATTA [A.K], Essentials of human Anatomy: Thorax and Abdomen Ed 2. Vol. I Current Book International, Calcutta 1994, p433, Rs. 200/-DATTA [A.K], Essentials of human Anatomy: Head and Neck Ed 2. Vol. II.

5.Current Book International, Calcutta 1995, p363, Rs. 150/-5. SINGH [Inderbir], Text book of Anatomy with colour atlas: Introduction, Osteology, Upper Extremity, Lower Extremity. Vol I. P Brothers, New Delhi 1996.

6.SINGH [Inderbir], Text book of Anatomy with colour Atlas: Thorax and Abdomen. Vol II. J P Brothers, New Delhi 1996.

7.SINGH [Inderbir], Text book of Anatomy with colour Atlas: Head and Neck Central Nervous System. Vol III. J P Brothers, New Delhi 1996, Rs. 175/-

8.SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990, p 191, Rs. 50/-

| Course code- B23HE0202 | HUMAN PHYSIOLOGY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 4 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basis of excretory system, respiratory system, nervous system, gastrointestinal physiology and reproductive system.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To acquire knowledge on excretory system and muscular physiology
2. To know about the working of respiratory system
3. To learn about the gastro intestinal physiology
4. To learn about reproductive system in male and female and basis of contraception

**Course Outcomes**

1. **CO1**. Able to understand the physiology working of excretory system and muscular system
2. **CO2**. Able to understand the working of respiratory system, transport of oxygen and carbon dioxide and diseases affecting the respiratory system
3. **CO3**.Will acquire active knowledge on gastrointestinal physiology working understand the organs involved in digestion and gastrointestinal diseases and disorders
4. **CO4.** Achieve knowledge about reproductive organs menstrual cycle and contraception

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0202 | CO1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 2 |
| | CO2 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 |
| | CO3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| | CO4 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 |

**Course Contents: 48 Hours**

**Course Description**

## UNIT -I

## EXCRETION

Structure and function of kidney

Structure and function of nephron

Formation of urine – Filtration, Reabsorption, Secretion Micturition

## ENDOCRINE

General metabolism – Carbohydrate, Fat, Protein

Physiological action, regulation, disorder of hormones – Adrenal, Pancreatic, Parathyroid, Thyroid

## UNIT-II

## SPECIAL SENSE

Vision – rods and cones, retina and its function, visual pathway

Hearing – organ of corti, auditory pathway

Olfaction

Taste – taste buds

## NERVOUS SYSTEM

Outline the structure and function of central nervous system, Outline the ANS, Types of nerve cells, electrical. Properties of nerve cells, properties of mixed nerves, Reflex action, degeneration and regeneration of nerve, control of posture, outline of Voluntary movement, cutaneous, deep and superficial sensation, synaptic transmission, neuromuscular junction, properties of muscles, contractile response, types of contraction.

General organization of nervous system, Structure, type and function of neuron, Properties of neurons, Synapse and synaptic transmission, Neurotransmitters, Reflex – Properties and types, Sensory – Receptors, sensory pathway, pain pathway, referred pain, modulation of pain, Motor – Basal ganglia, Cerebellum, Cortex –Function & Effect of lesion, Ascending and Descending pathway, Posture and Equilibrium, Muscle tone

ANS – organization, function of SNS & PSNS

CSF – composition, formation, circulation, function

LMN & UMN lesion

## UNIT-III

## CARDIOVASCULAR SYSTEM

Cardiac Muscles, conducting system-components, impulse conduction, heart valves.

Cardiac cycle- definition, phases of cardiac cycle Cardiac output- definition, normal value, determinants. Stroke volume and its regulation Heart rate and its regulation: Arterial pulse, Blood pressure-definition, normal values, factors affecting blood pressure Shock-definition, classification, causes and features Basic idea of ECG Cardiovascular changes during exercise. Structures and properties of heart muscle, action of heart, Normal ECG, Maintenance of Blood pressure, cardiac arrest and heart failure, hypertension, oedema, central and peripheral venous pressure

## GASTROINTESTINAL SYSTEM

Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication (in brief) Swallowing: Definition. Different stages. Functions. Stomach: Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting. Pancreatic Secretion: Composition, production, function. Regulation. Liver: Functions of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions. Intestine: Succus entericus: Composition, function and regulation of secretion. Intestinal motility and its function and regulation. Mechanism of Defaecation.

## UNIT-IV

## RESPIRATORY SYSTEM

Respiratory System: Mechanics of respiration Lung volumes and capacities Pulmonary circulation, transport of respiratory gases Factors affecting respiration, Oxygen transport Regulation of respiration- neural regulation, voluntary control and chemical regulation Hypoxia, Hypercapnia, Hypocapnia, Artificial respiration Disorders of respiration- dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, tachypnoea Respiratory changes during exercise.

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

| Course code B23HE0203 | BIOCHEMISTRY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basis of chemistry and metabolism of human body.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom

**Course Objective**

To understand the general Biochemistry deals with biochemical nature of the Carbohydrates, Proteins, Minerals, Vitamins, Lipids etc

**Course Outcomes**

1. **CO1**: To understand the Chemistry of Carbohydrate
2. **CO2**: To understand the chemistry of Lipids of human body
3. **CO3**: To gain knowledge on the chemistry of Proteins and Enzymes that happens in human body.
4. **CO4**: To gain the knowledge and understanding about the vitamins and minerals

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0203 | CO1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 2 |
| | CO2 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 |
| | CO3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| | CO4 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 |

**Course Contents: 48 Hours**

**Course Description**

**UNIT -I**

**Biological Oxidation, Electron Transport Chain & Oxidate Phosphorylation**

Bioenergetics: Basic concepts of metabolic energy capture and transfer. Biochemical energetic group transfer reactions of ATP, Biological oxidation: Biological redox couplers, participation in oxidative metabolism. Free energy changes in electron transfer reactions. Mitochondrial electron transfer system.

Oxidative phosphorylation: Mechanism of proton pumping. Proton motive force and the Mitchell hypothesis. FoF1-ATPase- structure and mechanism, Coupling of electron transfer to ATP synthesis. Uncouplers, inhibitors and ionophores, partial reactions of OP, P/O ratios and their use in localization of sites of ATP synthesis along the chain. Mechanism of oxidative phosphorylation, mitochondrial specific transport systems and energy charge. ATP synthesis in bacteria. H + pumping by bacteriorhodopsin Photosynthetic electron transport. Structure and function of chloroplast ATP- synthase.

## UNIT II

### Metabolism of Carbohydrate & Disorders

Carbohydrates – Glycolysis, various forms of fermentations in micro-organisms, citric acid cycle, its function in energy generation and biosynthesis of energy rich bond, pentose phosphate pathway and its regulation. Gluconeogenesis, glycogenesis and glycogenolysis, glyoxylate and Gamma aminobutyrate shunt pathways, Cori cycle, anaplerotic reactions, Entner-Doudoroff pathway, glucuronate pathway.

Metabolism of disaccharides. Hormonal regulation of carbohydrate metabolism. Energetics of metabolic cycle.

Diagnosis & Disorders of Carbohydrate Metabolism – Diabetes mellitus, glucose and galactose tolerance tests, sugar levels in blood, renal threshold for glucose, factors influencing blood glucose level, glycogen storage diseases, pentosuria, galactosemia.

## UNIT III

### Metabolism of lipids and its Disorders

Lipids – Introduction, hydrolysis of tri-acylglycerols, α-, β-, ω- oxidation of fatty acids. Oxidation of odd numbered fatty acids – fate of propionate, role of carnitine, degradation of complex lipids. Fatty acid biosynthesis, Acetyl CoA carboxylase, fatty acid synthase, ACP structure and function.

Lipid biosynthesis, biosynthetic pathway for tri-acylglycerols, phosphoglycerides, sphingomyelin and prostaglandins. Metabolism of cholesterol and its regulation. Energetics of fatty acid cycle.

Diagnosis & Disorders of Lipids – Plasma lipoproteins, cholesterol, triglycerides & phospholipids in health and disease, hyperlipidemia, hyperlipoproteinemia, Gaucher's disease, Tay-Sach's and Niemann-Pick disease, ketone bodies, Abetalipoproteinemia.

**UNIT IV**

**Metabolism of amino acids and its Disorders Amino Acids** – General reactions of amino acid metabolism - Transamination, decarboxylation, oxidative & non-oxidative deamination of amino acids.. Transport of ammonia and Urea cycle and its regulation. Specialised product derived from amino acids Decarboxylation- De-amination- Transmethylation & their importance-Detoxification of ammonia including urea cycle.

Clinical biochemistry: Relevance of blood levels of, urea, & uric acid, Protein in urine, LFT& RFT.

Acid base balance- concepts & disorders - pH, Buffers, Acidosis, Alkalosis

**Recommended Textbooks:**


1. U Satyanarayan,(2008), Essentials of Biochemistry,2nd edition, Standard Publishers
2. S. Ramakrishnan, K G Prasannan and R Rajan: Text book of Medical Biochemistry, Orient Longman, Madras, 1990
3. D.R. Whikehart: Biochemistry of the Eye, 2nd edition, Butterworth Heinemann, Pennsylvania, 2003
4. D M Vasudevan, (2011),Text book of Medical Biochemistry,6th edition Jaypee Publishers
5. M N Chatterjea & Rana Shind,Text book of Medical Biochemistry, Jayppe Publications
6. Singh & Sahni,(2008),Introductory Practical Biochemistry,2nd edition, Alpha Science
7. Schaum's Outline of Biochemistry.Philip W. Kuchel, Ph.D, Simon Easterbrook-Smith, Vanessa Gysbers, J. Mitchell Guss
8. Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology

| Course code<br>B23HE0204 | BASIC KINESIOLOGY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:**<br>2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic concepts of muscle structure and function and application of biomechanics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

Aims at introducing the students to the basic concepts of kinesiology To interpret the importance of nervous system and endocrine system

1. **CO1**- Describe basic concepts of muscle structure and function.

**Course Outcomes**

2. **CO2**- Describe applied principles of biomechanics.

**Mapping of Course Outcomes with Programme Outcomes.**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0204 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**Course Description**

UNIT-I

**MUSCLE STRUCTURE AND FUNCTION**

1. Describe mobility and stability functions of muscle.
2. Describe elements of muscle structure- composition of muscle fiber, motor unit, types of muscle fibre, muscle fibre size, arrangement and number, muscle tension, length – Tension relationship.
3. Active and passive insufficiency
4. Describe types of muscle contraction, speed, angular velocity, and applied load, voluntary Control, torque, isokinetic exercise

5. Factors affecting muscle tension
6. Active and passive tension
7. Classify muscle – spurt and shunt muscle, tonic and phasic muscle.
8. Agonist, antagonist and synergist.
9. Factors affecting muscle function: type of joint and location of muscle attachments, number of joints, sensory receptors.

## UNIT-II

### APPLIED BIO-MECHANICS, POSTURE & GAIT

1. Springs-Series and Parallel
2. Definition of speed, Velocity, Work, Energy, Power, Acceleration, Momentum, Friction, Inertia
3. Normal pelvic tilt, anterior pelvic tilt, posterior pelvic tilt.
4. Levers in the human body with examples and Equilibrium of a lever.

### INTRODUCTION TO POSTURE

1. Posture
2. Normal Posture -Overview of the mechanism of normal posture.
3. Abnormal Posture – Assessment, Types, aetiogenesis, management, including therapeutic exercises.

### BASIC CONCEPTS OF GAIT

1. Overview of normal gait & its components.
2. Gait deviations - Assessment, Types, aetiogenesis

**Recommended Textbooks:**


1. Progressive resisted exercises – by Margaret Hollis
2. Therapeutic Exercise by Carolyn Kisner
3. Kinesiology by Cynthia Norkins
4. PNF – Knott and Voss.
5. Therapeutic exercise by Basmijjan & Wolf.
6. Muscle testing by Daniel Kendall
7. Clinical evaluation – Lacote (for Isolated assessment of abdominal muscles)
8. Muscle stretching & Auto stretching – Olaf Evjenth
9. Orthopaedic Evaluation – Magee (only for assessment of posture)

| Course code B23AH0705 | SOCIOLOGY | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic knowledge of social science, society and cimmunity life.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

This course will enable students to understand the principles and concepts of sociology, with factors affecting health and disease in the community.

1. **CO1**- Interpret knowledge gained in the study of types and scope of sociology.

**Course Outcomes**

2. **CO2**- Interpret knowledge gained in the study of social factors affecting health in the society.

**Mapping of Course Outcomes with Programme Outcomes.**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23AH0705 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

UNIT-I

**INTRODUCTION:**

1. Meaning- Definition and scope of sociology
2. Its relation to Anthropology, Psychology, Social Psychology.
3. Methods of Sociological investigations- Case stud, social survey, questionnaire, Interview and opinion poll methods.
4. Importance of its study with special reference to Health Care Professionals. Social Factors in Health and disease situations:

1) Meaning of social factors

2) Role of social factors in health and illness

3) Socialization:

- Meaning and nature of socialization
- Primary, Secondary and Anticipatory socialization
- Agencies of socialization

5. 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 the hospital and rehabilitation setup.

6. 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 disease and their importance to physiotherapy.

7. Community:

1) Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal community.

2) Urban community: Meaning and features- Health hazards of urbanities.

8. Culture and Health:

1) Concept of Health

2) Concept of Culture

3) Culture and Health

4) Culture and Health Disorders

UNIT-II

9. Social change:

1) Meaning of social changes.

2) Factors of social changes.

3) Human adaptation and social change

4) Social change and stress.

5) Social change and deviance.

6) Social change and health programme

7) The role of social planning in the improvement of health and rehabilitation.

8) Social Problems of disabled:

Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems.

a) Population explosion

b) Poverty and unemployment

c) Beggary

d) Juvenile delinquency

e) Prostitution

f) Alcoholism

g) Problems of women in employment

h) geriatric problems

i) Problems of underprivileged.

9) Social Security: Social security and social legislation in relation to the disabled.

a) Social worker:

1) Meaning of Social Work

2) The role of a Medical Social Worker

**Recommended Textbooks:**

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.

| Course code B22HE0205 | BIO-PHYSICS AND BASIC ELECTROTHERAPY | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic concepts of bio physics and electrotherapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

Aims at introducing the students to the concepts of basic biophysics and electrotherapy.

**Course Outcomes**

1. **CO1**- describe basic concepts of biophysics.
2. **CO2**- describe basic theoretical principles of electrotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0205 | CO1 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 1 | -- | -- | -- | 1 | 1 | 1 | 1 | 2 |

**Course Contents: 48 Hours**

**Course Description**

**UNIT-I**

PHYSICAL PRINCIPLES

1. Structure and properties of matter -solids, liquids and gases, adhesion, surface tension, viscosity,
2. density and elasticity.
3. Structure of atom, molecules, elements and compound
4. Electricity: Definition and types. Therapeutic uses. Basic physics of construction.
5. Working Importance of currents in treatment.
6. Static Electricity: Production of electric charge. Characteristic of a charged body.

7. Characteristics of lines of forces. Potential energy and factors on which it depends.
8. Potential difference and EMF.

ELECTRICITY

1. Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt
2. Condensers: Definition, principle, Types- construction and working, capacity & uses.
3. Alternating current.
4. Magnetism: Definition. Properties of magnets. Electromagnetic induction.
5. Transmission by contact. Magnetic field and magnetic forces. Magnetic effects of an electric field. Conductors, Insulators, Potential difference, Resistance and intensity, Ohm's law and its application to DC and AC currents. Fuse: construction, working and application.
6. Transmission of electrical energy through solids, liquids, gases and vacuum. Rectifying Devices-Thermionic valves, Semiconductors, Transistors, Amplifiers, transducer and Oscillator circuits. Display devices and indicators-analogue and digital. Transformer: Definition, Types, Principle, Construction, Eddy current, working uses Chokes: Principle, Construction and working, Uses

**UNIT-II**

1. Effects of Current Electricity
2. Chemical effects -Ions and electrolytes, Ionisation, Production of an EMF by chemical actions.
3. Electromagnetic Induction.
4. Electromagnetic spectrum.
5. Electrical Supply
    a. Brief outline of main supply of electric current
    b. Dangers-short circuit, electric shocks.
    c. Precaution-safety devices, earthing, fuses etc.
    d. First aid and initial management of electric shock
6. Various agents
    a. Thermal agents: Physical Principles of cold, Superficial and deep heat.
    b. Ultrasound: Physical Principles of Sound
    c. Electromagnetic Radiation: Physical Principles and their Relevance to Physiotherapy Practice.

d. Electric Currents: Physical Principles and their Relevance to Physiotherapy Practice.

## UNIT-III

MECHANICS:

1. Definition of mechanics and biomechanics.
2. Springs - properties of springs, springs in series and parallel, elastic materials in use
3. Speed, Velocity, Work, Energy, Power, Acceleration, Momentum - principles, and practical application
4. Friction.
5. Elasticity - Definition, stress, strain, Hooke's Law

CURRENTS:

1. DC Currents -Modern concept of electricity: fundamental electric charges (proton and electron), bound and
2. free electrons, free electrons and current, static electric charge, charging of an object potential and capacitance, potential difference and EMF
3. AC currents: Sinusoidal wave from, frequency, wavelength, Amplitude and phase of a sine wave, average & RMS value of a sine wave. Quantity of electricity, magnitude of current, conductors and insulators, resistance of conductor and Ohm's law, resistances in series and parallel.
4. Capacitors: Electric field around a capacitor, charging and discharging a capacitor, types of capacitors with application of each in Physiotherapy department.
5. Rheostat: series and shunt Rheostat with application of each in the Physiotherapy department.
6. Effects of electric Current: Thermal effect, chemical effect (ionization) and magnetic effect. Electric shock, Earth shock, causes and its prevention.
7. Magnetism: Magnetic - non-magnetic substances and their properties, properties of magnet, molecular theory, poles of magnet and its properties, magnetic lines of force and their properties, Electromagnetism, magnetic effects of electric current, Electromagnetic induction, Lenz's law, Inductor and Inductance types of inductors, reactance and impedance.
8. Condenser – Potential & capacity, Principles, factors determining capacity, construction. Electric field, charging & discharging and use of condenser in electrotherapy.
9. Cosine law and its implications.

10. Physical effects of heat and radiation. Laws governing radiation.
11. Law of Grotius and its implications.

**UNIT-IV**

1. Thermionic Valves: Thermionic emission, Diode and Triode valves and their characteristics, Construction and application of Cathode Ray Oscilloscope
2. Semiconductor Devices: Intrinsic and extrinsic semiconductors, Light Emitting Diodes, integrated circuits
3. Electronic Circuits: Rectifiers & smoothing circuits, Oscillators - Sinusoidal and non-sinusoidal types
4. A.C. AND D.C. meters: Functions and applications of Ammeter and volt meters, Ohmmeters,
5. Wheat stone bridge.
6. Introduction to Therapeutic Energies – Thermal, Mechanical, Electrical, Electromagnetic and
7. Magnetic - Definition, description, physiological effects, pathological effects and dangers
8. Medical Instrumentation for Physical Therapy: Brief description of generation, circuit diagrams and testing
9. Low frequency currents, Direct currents, medium frequency currents.

The following have to be demonstrated in the lab-

1. Different states of matter
2. Types of electricity, electric currents
3. Transformers, thermo ionic valves
4. Electrotherapy equipments- structure and functioning

**Recommended Textbooks**


1. Claytons Electrotherapy by Forster &Plastangs
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Electrotherapy Evidene based practice by Sheila Kitchen
5. Physical agents by Michile Cameroon
6. Principles of Electrotherapy by MichileCamreeon
7. Thermal agents by Susan Michlovitz

| Course Code<br>B22LHM201 | CONSTITUTION OF INDIA & PROFESSIONAL ETHICS | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:**<br>2 hrs /week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic knowledge of Indian history.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Aim in knowledge on Constitution of India and to understand about the fundamental rights, duties and other rights which is been given by our law.
2. Understand the Constitution perspective and make them face the world as a bonafide citizen

**Course Outcomes**

1. **CO1**: Analyze the Fundamental Rights, Duties and other Rights protected under Indian Constitution, demonstrate practicality of constitution perspective
2. **CO2**: make the students face the world as a bonafide citizen; understand different union and state policies and their effect on industrialization in India.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22LHM201 | CO1 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 1 | -- | -- | -- | 1 | 1 | 1 | 1 | 2 |

**Course Contents: 24 Hours**

## Course Description

### UNIT-I

1. Meaning of the term “Constitution” making of the Indian Constitution 1946-49
2. The democratic institution created by the Constitution Bicameral system of Legislature at the Centre and in the States.

3. Fundamental Rights and Duties…Their content and significance.
4. Directive Principles of States Policies …The need to balance Fundamental Rights with Directive Principles.
5. Special Rights created in the Constitution for: Dalits, Backwards, Women and Children and the Religious and Linguistic Minorities.

**UNIT-II**

1. Doctrine of Separation of Powers-----Legislative, Executive and Judicial and their functioning in India.
2. The Election Commission and State Public Service Commissions.
3. Method of amending the Constitution.
4. Enforcing rights through Writs: Certiorari, Mandamus, Quo warranto and Habeas Corpus.
5. Constitution and Sustainable Development in India.

**UNIT-III**

Judiciary: Supreme Court of Indian, High Court, Right to Information Act 2005, Consumer Protection- Consumer Rights- Caveat Emptor and Caveat Venditor.

**UNIT-IV**

Professional Ethics: Definition Scope and need of ethics for professional, Personal Ethics and Business Ethics, Ethical Standards, Duties of Employers and Employees. Due Care theory, Environmental Ethics, Ethical Code of Conduct in ethics. Best Ethical Companies in India and Abroad; Corporate Social Responsibilities, Code of Conduct and Ethical Excellence.

**Recommended Textbooks:**


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

| Course code: B22AS0207 | TREE PLANTATION IN TROPICAL REGION: BENEFITS AND STRATEGIC PLANNING | L | T | P | C |
|---|---|---|---|---|---|
| Duration: 2 hrs./week | | 1 | 0 | 0 | 1 |

**Pre-requisites**

Nil

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Develop basic understanding of the role of trees in climate change.
2. Emphasize the selection and placing of a tree for maximum benefit to environment.
3. Involve in planting a tree and nurture till the completion of the degree program.
4. Generate experiential report on the tree plantation process involved.

**Course Outcomes**

1. **CO1**: Interpret the possible key benefits of trees arresting climate change and global warming.
2. **CO2**: Develop the ability to identify the type of a tree to be planted in urban areas, agricultural fields and forestry areas.
3. **CO3**: Make use of reading different literature on climate change and global warming by adopting various reading strategies (Reading Skills)
4. **CO4**: Take part in planting a tree and nurturing it

**Mapping of Course Outcomes with Programme Outcomes.**

| Course Code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22AS0207 | CO1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 2 |
| | CO2 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 |
| | CO3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| | CO4 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 |

**Course Contents: 48 Hours**

## Course Description

This course introduces significance of trees that provide us with a great many ecosystem services, including air quality improvement, energy conservation, stormwater interception, and atmospheric carbon dioxide reduction.

These benefits must be weighed against the costs of maintaining trees, including planting, pruning, irrigation, administration, pest control, liability, clean-up, and removal.

Students are expected to involve in planting a tree and nurturing till the completion of their degree program.

Successful maintenance of tree is considered to be one of the eligibility criterions for the award of university degree. This course is a part of "REVA Vanamahotsava – One Student, One Tree"

**Unit I:** Introduction: The tropical region, Benefits and costs of urban and community forests.

**Unit II:** General Guidelines for Selecting and Placing Trees: Guidelines for Energy Savings, Guidelines for Reducing Carbon Dioxide, Guidelines for Reducing Stormwater Runoff, Guidelines for Improving Air Quality Benefits, Guidelines for Avoiding Conflicts with Infrastructure, Guidelines for Maximizing Long-Term Benefits, Trees for Hurricane-Prone Areas

**Activity based learning-**

Every student has to thoroughly understand the significance of planting a tree, identify type of tree and place to be planted, plant a tree and nurture till the completion of the degree.

**Recommended Textbooks:**


1. Peter Wohlleben, The Heartbeat of Trees, Penguin Books, 2021
2. Daniel Chamovitz, "What a Plant Knows: A Field Guide to the Senses", 2020
3. Kelaine E. Vargas, E. Gregory McPherson, James R. Simpson, Paula J. Peper, Shelley L. Gardner, and Qingfu Xiao, "Tropical community tree guide: Benefits, Costs and Strategic Planting", U.S. Department of Agriculture, Forest Service Pacific Southwest Research Station Albany, California

| Course code<br>B23HE0206 | PRACTICAL: HUMAN ANATOMY LAB-II | L | T | P | C |
|---|---|---|---|---|---|
| Duration:<br>3 hrs. /wk. | | 0 | 0 | 2 | 2 |

**Pre-requisites**

Students on completion of study of basic human anatomy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the human body
2. To obtain knowledge regarding the basics of human anatomy

**Course Outcomes**

1. **CO1**. Ready to explain the organization of components in the Human Body
2. **CO2**. Able to understand the structural compositions in skeletal system

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0206 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

## Course Description

1. Upper extremity including surface Anatomy
2. Lower extremity including surface Anatomy
3. Head & Spinal cord and Neck and Brain including surface Anatomy

**Recommended text books:**


1. ROMANES [ G J], Cunningham manual of practical anatomy: upper and lower limb ed 15Vol 1 Oxford
2. Medical Publication, Oxford 1996, P263, Rs. 325/-
3. ROMANES [G J], Cunningham manual of practical anatomy: Thorax and abdomen ed15 Vol II Oxford
4. Medical Publication, Oxford 1996, P298, Rs. 325/-
5. ROMANES [G J], Cunningham manual of practical anatomy: Head and Neck and Brain ed 15 Vol II Oxford Medical Publication, Oxford 1996, P346, Rs. 325/-

| Course code<br>B23HE0207 | PRACTICAL: HUMAN PHYSIOLOGY LAB-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:**<br>3 hrs/week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on completion of study of basic human physiology.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the human physiology
2. To obtain knowledge regarding the basics of human physiology

**Course Outcomes**

1. **CO1**. Ready to explain the organization of components in the human physiology
2. **CO2**. Able to understand the physiological compositions in human body

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0207 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

Experiments-

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
9. Determination of clotting time
10. Determination of RBC count
11. Determination of WBC count
12. Differential leukocyte count
13. Estimation of haemoglobin
14. Estimation of glucose
15. Calculation of blood indices
16. Determination of ESR
17. Determination of PCV
18. Determination of Blood count
19. Determination of TC/DC, CBC
20. CBC
21. RBC count
22. WBC count
23. Determination of PCV
24. Estimation of Hb
25. ESR
26. Calculation of red cell indices (MCV MCH MCHC)
27. Pulse reading
28. Connective epithelial muscular and nervous tissue examination (permanent slides)

2. Recommended Demonstrations

1. Spirometry
2. Artificial Respiration
3. ECG
4. Perimetry
5. Mosso's Ergometry.

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

| Course code B23HE0208 | PRACTICAL KINESIOLOGY LAB-II | L | T | P | C |
|---|---|---|---|---|---|
| Duration: 3 hrs./week | | 0 | 0 | 2 | 2 |

**Pre-requisites**

Students on completion of study of basic human physiology.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the kinesiology
2. To obtain knowledge regarding the basics of kinesiology

**Course Outcomes**

1. **CO1**. Ready to explain the mechanism of components in the human biomechanics
2. **CO2**. Able to understand the biomechanical aspect of human body

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0208 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

Experiments-

1. Demonstration of movements occurring in human body, and identification axes and planes of movements-
    i. Flexion and extension
    ii. Abduction and adduction
    iii. Rotations
    iv. Circumduction
    v. Inversion- eversion
    vi. Dorsi flexion and plantar flexion
    vii. Protraction and retraction
    viii. Supination and pronation
    ix. Elevation and depression.

2. Demonstration of levers in human body-
    i. 1st order lever
    ii. 2nd order lever
    iii. 3rd order lever

3. Demonstration of angle of pulls of muscles and action of anatomic pulleys.
4. Identification of different types of joints in human body.
5. Demonstration of kinematics chains, range of motion of different joints.
6. Demonstration of active and passive insufficiency
7. Demonstration of different types of muscle contraction
8. Demonstration of – spurt and shunt muscle, tonic and phasic muscles, agonists, antagonists and synergists
9. Demonstration of types of motion -Angulatory or Rotatory, Translation or Linear, Curvilinear.
10. Demonstration of phases of gait

**Recommended Textbooks:**

1. Progressive resisted exercises – by Margaret Hollis
2. Therapeutic Exercise by Carolyn Kisner
3. Kinesiology by Cynthia Norkins
4. Orthopaedic Evaluation – Magee (only for assessment of posture)

| Course code B22HE0301 | PATHOLOGY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs/week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Students on completion of study of basic concepts of pathology and terminologies used in the subject.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To discuss about the history, basic concept of pathology, safety and basic histo technology
2. To reveal blood composition blood cell & plasma, coagulation factors and blood cell formation
3. To discuss about RBC, hemoglobins, oxygen dissociation curve and study of blood group
4. To explain about sectioning, staining of tissue and various types of stain

**Course Outcomes**

1. **CO1**.To be aware about the history and basic concept of pathology, safety and basic histo technology, blood cell & plasma composition, coagulation factors and stage of blood cell formation.
2. **CO2**. To know about RBC, normal and abnormal hemoglobin, oxygen transport and blood group system.

**Mapping of Course Outcomes with Programme Outcomes**

| CourseCode | POS / COs | PO1 | P 2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0301 | CO1 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |

**Course Contents: 26 Hours**

## UNIT-I

### General Pathology

1. Introduction to Pathology
2. Cell injuries:

Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure.
Reversible cell injury: Types, Sequential changes, Cellular swellings, vacuolation, Hyaline changes, Mucoid changes. Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis.
Pathologic calcification: Dystrophic and Metastatic. Intracellular Accumulations - Fatty changes, Protein accumulations, Glycogen accumulations,
Pigments - Melanin / Hemosiderin.
Extra cellular accumulations: Amyloidosis - Classification, Pathogenesis, Pathology including special stains.

3. Inflammation and Repair

Acute inflammation: features, causes, vascular and cellular events.
Inflammatory cells and Mediators. Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples.
Repair, wound healing by primary and secondary union, factors promoting and delaying the process.
Healing in specific site including bone healing.

4. Immunopathology

Immune system: General concepts.
Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples.
Secondary immunodeficiency including HIV infection. Auto-immune disorders: Basic concept sand classification, SLE.
AIDS-Aetiology, Modes of transmission, Diagnostic procedures, handling of infected material and health education.

5. Infectious diseases

Mycobacterial diseases: Tuberculosis, Leprosy and Syphilis.
Bacterial disease: Pyogenic, Diphtheria, Gram negative infection, Bacillary dysentery.
Viral diseases: Poliomyelitis, Herpes, Rabies, Measles, Rickettsia, Chlamydial infection, HIV
Fungal disease and opportunistic infections.
Parasitic diseases: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst.

6. Circulatory Disturbances Hyperaemia/Ischemia and Haemorrhage Oedema Pathogenesis and types.

Chronic venous congestion: Lung, Liver, Spleen, Systemic Pathology Thrombosis and Embolism: Formation, Fate and Effects.

Infarction: Types, Common sites.

Shock: Pathogenesis, types, morphologic changes.

7. Growth Disturbances and Neoplasia

Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, Metaplasia, Malformation, agenesis, dysplasia. Precancerous lesions.

Neoplasia: Definition, classification, biological behaviour: Benign and Malignant, Carcinoma and Sarcoma. Malignant Neoplasia: Grades and Stages, Local & Distant spread.

Carcinogenesis: Environmental carcinogens, chemical, viral, occupational. Heredity and cellular oncogenes and prevention of cancer.

Benign & Malignant epithelial tumours E.g. Squamous papilloma, Squamous cell carcinoma, Malignant melanoma. Benign & Malignant mesenchymal tumours E.g.: Fibroma, Lipoma, Neurofibroma, Fibrosarcoma, Liposarcoma, Rhabdo-myosarcoma, Teratoma.

8. Nutritional Disorders

Protein energy malnutrition: Marasmus, Kwashiorkor, and Vitamin deficiency disorders, classification with specific examples.

9. Genetic Disorders

Basic concepts of genetic disorders and some common examples and congenital malformation

## UNIT -II

**Systemic pathology**

10. Haematology

Constituents of blood and bone marrow, Regulation of haematopoiesis. Anaemia: Classification, clinical features & lab diagnosis.

Nutritional anaemias: Iron deficiency anaemia, Folic acid, Vit. B 12 deficiency anaemia including pernicious anaemia. Haemolytic Anaemias: Classification and Investigations.

Hereditary haemolytic anaemias: Thalassemia, Sickle cell anaemia, Spherocytosis and Enzyme deficiencies.

Acquired haemolytic anaemias

i. Alloimmune, Autoimmune
ii. Drug induced, Microangiopathic Pancytopenia - Aplastic anaemia.

Haemostatic disorders, Vascular and Platelet disorders & lab diagnosis. Coagulopathies - (i) Inherited (ii) Acquired with lab diagnosis.

Leukocytic disorders: Leukocytosis, Leukopenia, Leukemoid reaction. Leukemia: Classification, clinical manifestation, pathology and Diagnosis. Multiple myeloma and dysproteinemias.

Blood transfusion; Grouping and cross matching, untoward reactions, transmissible infections including HIV & hepatitis, Blood-components & plasma-pheresis.

**Recommended Textbooks**

1. Text book of pathology: Harsh Mohan
2. General systemic pathology: Churchill Livingstone
3. Text book of Pathology: Robbins

| Course code B22HE0302 | MICROBIOLOGY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Students on Completion of study of microbial cell structure and function and basic principles of sterilization, disinfection and Microscope.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To learn the fundamental aspects of microbiology including taxonomy and classification
2. To understand about different kinds of microscopes used in the microbiology laboratory
3. To learn about gram staining for the identification of bacteria
4. To learn about disinfection methods used to control contamination of micro organisms

**Course Outcomes**

1. **CO1**. Ascertain about the fundamental aspects of microbiology including taxonomy and classification, knowledge of microscopes used in the microbiology laboratory.
2. **CO2**. Ascertain the knowledge of gram staining/about disinfection methods used to control contamination of microorganisms.

**Mapping of Course Outcomes with Programme Outcomes**

| CourseCode | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0302 | CO1 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 1 |
| | CO2 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |

**Course Contents: 26 Hours**

## UNIT -I

### General Microbiology

Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack9r3ate, normal flora of the human body. Routes of infection and spread; endogenous and exogenous infections; source at reservoir of infections. Bacterial cell. Morphology limited to recognizing bacteria in clinical samples Shape, motility and arrangement. Structures, which are virulence, associated.

Physiology: Essentials of bacterial growth requirements.

Sterilization, disinfection and universal precautions in relation to patient care and disease prevention. Definition of asepsis, sterilization, disinfection.

Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum of activity.

## UNIT -II

Immunology

Basic principles of immunity immunobiology: lymphoid organs and tissues. Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis.

Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity. Immunology of hypersensitivity, Measuring immune functions.

Bacteriology

To be considered under the following headings

Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, collection and transport of samples for laboratory diagnosis, interpretation of laboratory reports, Staphylococci, Streptococci and Pneumococci,

Mycobacteria: Tuberculosis, M. leprae, atypical mycobacteria, Enterobacteriaceae,

Vibrois: V. cholerae and other medically important vibrios, Campylobacters and Helicobacters, Pseudomonas, Bacillus anthracis, Sporing and non-sporing anaerobes: Clostridia, Bacteroides and Fusobacteria

**Recommended Textbooks:**

1. Short text book of Medical Microbiology by Sathish Gupta
2. Text book of Microbiology by Jayaram Panicker
3. Microbiology &Parasitology by Rajeshwar Reddy
4. Text book of Microbiology by Anantha Narayanan
5. Microbiology by Baveja
6. Text book of microbiology by Chakraborthy

| Course code B22HE0303 | BIOMECHANICS-I | L | T | P | C |
|---|---|---|---|---|---|
| Duration: 3 hrs/week | | 2 | 1 | 0 | 3 |

**Pre-requisites**

Basic of biomechanics

.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation
2. For treatment of disorders of Musculo skeletal system

**Course Outcomes**

1. **CO1**- demonstrate knowledge gained of the various methods of movements occurring in different joints of the human body.
2. **CO2**- interpret mechanical principles of posture and its deviations, interpret knowledge gained in the study of gait and its abnormalities.
3. **CO3** – understand hip joint mechanical principles
4. **CO4** - understand knee joint and ankle joint mechanical principles

**Mapping of Course Outcomes with Programme Outcomes**

| CourseCode | POS / COS | PO1 | P 2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0303 | CO1 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 1 |
| | CO2 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |
| | CO3 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 1 |
| | CO4 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

Biomechanics of the peripheral joints

1. The shoulder complex: Structure and components of the shoulder complex and their integrated function.

## UNIT-II

2. The elbow complex: Structure and function of the elbow joint – humero-ulnar and humero-radial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.
3. The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; prehension; functional position of the wrist and hand.

## UNIT-III

4. The hip complex: structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur.

## UNIT-IV

5. The knee complex: structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.
6. 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, deviations from normal structure and function – Pes Planus and Pes Cavus

**Recommended Text books:**


1. Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, New Delhi.
2. Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996,1stIndian Ed 1998, Rs 250.00
3. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997, Rs 300.00

| Course code B22HE0304 | EXERCISE THERAPY – I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of exercise, muscle and bone knowledge

.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. The objectives of this course are to make the students understand the structure
2. The movements occurring in the thorax, chest wall and TM joints of the body, and the mechanism of muscle actions.
3. The students also should be able to understand the mechanism of posture and gait cycle

**Course Outcomes**

1. **CO1**: Identify importance of therapeutic exercises, classify muscles
2. **CO2**: Explain fundamental and derived positions, analyses the active and passive movements, mat exercises.
3. **CO3**: Identify benefits of hydrotherapy, normal and pathological gaits.
4. **CO4**: Identify walking aids and their roles in walking, identify benefits and uses of breathing exercises

**Mapping of Course Outcomes with Programme Outcomes**

| CourseCode | POS / COs | PO1 | P 2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0304 | CO1 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| | CO2 | 2 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| | CO3 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 2 | 2 | 2 | 2 |
| | CO4 | 3 | 3 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 1 |

**Course Contents: 48 Hours**

## UNIT-I

1. INTRODUCTION TO EXERCISE THERAPY
    a. Introduction
    b. Effect of therapeutic exercise
    c. Types of skeletal muscle fibers (Type I & Type II)
    d. Classification of muscle-Based on arrangement of fascicule
       Parallel-Strap, fusiform, rhomboidal, triangular, Oblique-Unipennate, bipennate, multipennate, Circular
    e. Types of muscular contraction Isotonic, Isometric, Concentric, Eccentric
    f. Group muscle action - Agonist, Antagonist, Neutralizer, Stabilizer or Fixator
    g. Range of muscle work - Full range, Inner range, Middle range, Outer range

2. STARTING POSITION AND DERIVED POSITION
    a. Starting position
       Definition, Purpose, Positions-Standing, Sitting, Lying, Kneeling, Hanging
    b. Derived position - Definition, Purpose, Positions-
       Standing-High standing, Walk standing, Stride standing, Step standing Toe standing, half standing, Cross standing
       Sitting-Crook sitting, long sitting, Stoop sitting, Squatting, Side sitting Lying-Prone lying, half lying, Crook lying, side lying
       Kneeling-Half kneeling, kneel sitting, prone kneeling, inclined prone kneel
       Hanging-Half hanging

## UNIT-II

3. ACTIVE AND PASSIVE MOVEMENT
    a. Introduction
    b. Classification of movement-Active & Passive
    c. Active Movement-Definition, Indication, Effect, Types- Free, Active assisted, assisted resisted, resisted
    d. Passive Movement-Definition, Types- Relaxed passive movement-upper & lower extremity, Passive manual mobilization-mobilization of joint, Manipulation of joint, Stretching of soft tissues.

4. RELAXATION
    a. Introduction
    b. Indication
    c. Relaxation techniques-Local, General, Others
    d. Local relaxation Therapist massage Passive movement Muscle energy techniques - Hold relax, Contract relax
    e. General relaxation Contrast method Reciprocal inhibition
    f. Other relaxation Mental imagery, Autogenic training, Yoga & Meditation, Music therapy, Creational activities, Social modality

5. MAT ACTIVITIES & FUNCTIONAL RE-EDUCATION
    a. Introduction
    b. Demonstrate common mat activities -
    Rolling-Prone on elbows-Prone on hands-Hook lying-Bridging-Quadruped position-Long Sitting-Short Sitting-Kneeling-Half Kneeling-Standing-Walking

**UNIT-III**

6. HYDROTHERAPY
    a. Introduction
    b. Definition
    c. Principle - Buoyancy, Hydrostatic pressure, Hydrodynamic pressure, Turbulence
    d. Indication & Contraindication
    e. Physiological & Therapeutic effects
    f. Advantages
7. Types of hydrotherapy Hubbard tank Hydrotherapy pool, Foot bath Body wraps Contrast bath
8. Exercises in hydrotherapy
9. POSTURE
    a. Definition
    b. Postural control
    c. Standard posture
    d. Types of posture-Standing & Dynamic

e. Faulty or Abnormal postures

Excessive lordosis, Kyphotic lordosis Sway back, Flat back Flat neck Scoliosis Forward head Assessment of posture

10. GAIT, HUMAN LOCOMOTION, WALKING AIDS/ CRUTCH WALKING

a. Introduction
b. Definition
c. Gait cycle
d. Phases of gait
e. Muscular activity during stance & swing phase
f. Characteristic of normal gait

Vertical displacement of COG (Pelvic tilt), Lateral pelvic tilt, Horizontal dip of Pelvis, Pelvic forward and backward rotation, Knee flexion, Double limb support, Single limb support, cadence, step length, stride length, step duration, stride duration, Base width, Degree of toe out or foot angle

11. Pathological gait Trendelenburg gait Circumductory gait Hip hiking gait Foot drop gait Calcaneal gait Flexed knee gait Scissoring gait Parkinson gait Antalgic gait, Wide base gait, Lordotic gait, Anterior trunk bending Posterior trunk bending

**UNIT-IV**

12. WALKING AIDS

a. Definition
b. Indication
c. Types of walking aids
d. Crutches, Canes Walkers, Wheel chair

Crutches - Types-Axillary, Elbow or Forearm, Gutter Measurement for crutches-Axillary & Elbow Parts of crutch-Axillary & Elbow Crutch muscles and preparatory exercise

Gait pattern-Four point gait, two point gait, three point gait, PWB, NWB Swing to & Swing through, stair climbing

e. Canes Purpose

Types of cane-Standard cane, Standard adjustable canes, Tripod, Quadripod Gait pattern-Three point gait, two point gait

f. Walkers Purpose Parts

Types-Rigid walking frame, Foldable walker, Rollator, Reciprocal walker, Gutter Walker

g. Wheel Chair Introduction Purpose

Parts of wheel chair, Wheels, tyres, wheel locks, casters, hand rim, foot rest, tilt bar, seat and back rest. Measurement, Seat width, Seat height, Seat depth, Back rest height, Arm rest height. Types of wheel chair, Rigid, Foldable, One arm driven wheel chair, Powered wheel chair

13. BREATHING EXERCISES
    a. Definition
    b. Indication & Contraindication Physiological effect
    c. Types of Breathing Exercises Diaphragmatic breathing exercise
    d. Apical breathing, Costal breathing, Posterior basal Glossopharyngeal
    e. Pursed lip breathing Inspiratory hold

**Recommended Textbooks**


1. Therapeutic exercise by Barbara Bandy
2. Therapeutic exercise by Carolyn Kisner
3. Principles of exercise therapy by M. Dena Gardiner
4. Practical Exercise therapy by Hollis Margaret
5. Therapeutic exercise by Sydney Litch
6. Therapeutic exercise by Hall & Brody
7. Therapeutic exercise by Basmajjian
8. Physical Rehabilitation by O'Sullivan.
9. Therapeutic massage by Sinha
10. Principles of muscle testing by Hislop

| Course code B22HE0305 | ELECTROTHERAPY – I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic knowledge, low frequency and medium frequency.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. In this course the student will learn the Principles, Techniques, Effects, Indication, Contra- Indication.
2. The dosage parameter for various indications of electro therapeutic modalities in the restoration of physical function.

**Course Outcomes**

1. **CO1**- List the indications, contraindications, dosages of electro therapy modalities,
2. **CO2**- Demonstrates the different techniques, and describe their effects on various conditions.
3. **CO3** – Under about the electro diagnosis and related point.
4. **CO4** – Under about the iontophoresis

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0305 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 1 | 3 | 2 | 1 | 3 | 1 | 3 | 1 | 2 | 2 | 3 |
| | CO4 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 3 | 1 | 3 | 3 |

**Course Contents: 48 Hours**

## UNIT-I

ELECTRICITY

1. Definition and types 2 Therapeutic uses
2. Basic physics
3. Working
4. Importance of current in treatment& Uses

BASIC CONCEPTS IN ELECTRICAL STIMULATION

1. Resting Membrane Potential
2. Action Potential
3. Propagation of Action Potential
4. Motor Unit

## UNIT-II

THERAPEUTIC CURRENT

1. Definition
2. Principles
3. Types –Low Frequency current and Medium Frequency current
4. Types of Low Frequency Current

   Interrupted Galvanic Current/Modified Direct Current/Interrupted Direct Current Faradic Type Current, Tens, Iontophoresis, Sinusoidal Current, High Voltage Pulse, Galvanic Stimulation (HVPGS), Diadynamic Current, Functional Electrical Stimulation (FES)
5. Types of Medium Frequency Current

   Interferential Current-1.2 Pole IFC (Russian Current-2000HZ, Medium Frequency Current-4000HZ) 2.4 Pole IFC (4000HZ-4100HZ)-Classical & Vector

FARADIC CURRENT

1. Definition, Type, Duration
2. Production, Surging of Faradic Current
3. Physiological effects & Therapeutic effects of Faradic Current
4. Technique of application of Faradic Current
5. Motor Point

6. Preparation of apparatus (Assembling, Testing) Preparation of patient
7. Stimulation of motor point

INTERRUPTED DIRECT CURRENT

1. Definition, Type, Duration, Shape, Frequency
2. Production
3. Physiological effect & Therapeutic effect of Interrupted direct current
4. Effect of IGC on Innervated muscle & Denervated muscle
5. Technique of application of IGC
6. Motor Point
7. Preparation of apparatus (Assembling, Testing) Preparation of patient
8. Stimulation of motor point

SELECTION OF CURRENT

1. Differentiate between types of current, duration, shape, frequency used in stimulating nerve and muscle

**UNIT-III**

BIO-FEEDBACK

1. Definition
2. Basis of biofeedback
3. Principles of biofeedback
4. Uses of biofeedback
5. EMG bio feedback

ELECTRODIAGNOSIS

1. Introduction
2. Definition
3. Physiological basis
4. Principles of electro diagnosis
5. SD Curve Rheobase, Chronaxie Electromyography (EMG) Definition, Recording electrodes
6. Myoelectrical signal, amplifiers, display devices Basic wave pattern of an EMG signal
7. Nerve Conduction Test (MCV, NCV) H reflex, F Wave

8. Faradic-IDC test Galvanic tetanus ratio
9. SD Curve Test

   Definition

   Type of current used, shape, frequency Procedure

   Advantage, Disadvantage

   Characteristic of curve (Normal, Partial, Complete denervation) Factors that affect accuracy of SD curve

TENS

1. Definition
2. Neurophysiology of pain 3 Acute pain & chronic pain 4 Pain pathway
3. Neuromodulation of pain
4. Pain modulation- Gate control theory, descending pain suppression
5. Parameter of Tens-Waveform, Frequency, Pulse width, amplitude
6. Type of Tens-

   High Frequency Low Intensity Tens or Conventional Tens

   Acupuncture like Tens

   Brief Intense Tens

   Burst Mode Tens

   Electrode Placement, Advantage & Disadvantage of Tens, Uses of Tens and Contraindication of Tens

**UNIT- IV**

IONTOPHORESIS

1. Definition
2. Physics of iontophoresis
3. Technique of application of iontophoresis
4. Ions commonly used in iontophoresis and their clinical indication
5. Physiological effect & Therapeutic effect of iontophoresis
6. Dosage of iontophoresis
7. Dangers & Contraindication of iontophoresis

INTERFERENTIAL CURRENT

1. Definition

2. Production of interferential current
3. Types of interferential current

   Static interferential current or Classical interferential current (4 pole method)

   Dynamic interferential current or Iso-planar vector field (4 pole method) or Four electrodes with rotating vector

4. Parameters of IFT

   Quadripolar or Bipolar application

   Vector or Scanning mode

   Suction versus Plate electrode

   Current intensity

   Frequency sweep

   Amplitude modulated frequency

   Treatment duration

   Indications & contraindication of IFC

   Physiological effects of IFC

   Dangers of IFC

**Recommended Textbooks**


1. Claytons Electrotherapy by Forster & Plastangs
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Electrotherapy Evidence based practice by Sheila Kitchen
5. Physical agents by Michile Cameroon
6. Principles of Electrotherapy by Michile Camreeon
7. Thermal agents by Susan Michlovitz

| Course code B23AH0801 | PSYCHOLOGY | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic knowledge of behaviour of human study, related disorder and societal issue.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course serves to integrate the knowledge gained by the students in concepts of psychology, with relevance to physiotherapy

**Course Outcomes**

1. **CO1**- Interpret knowledge gained in the study of basic principles and methods of psychology.
2. **CO2**- Implement knowledge gained in the assessment and management of patients.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23AH0801 | CO1 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**UNIT-I**

1. Introduction to Psychology

   Schools: Structuralism, functionalism, behaviourism, Psychoanalysis.

   Methods: Introspection, observation, inventory and experimental method.

   Branches: pure psychology and applied psychology

   Psychology and physiotherapy
2. Growth and Development.

Life span: different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age).

Heredity and environment: role of heredity and environment in physical and psychological development, "Nature v/s Nurture controversy".

3. Sensation, attention and perception

   Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense.

   Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants)

   Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context)

   Illusion and hallucination: different types

4. Motivation

   Motivation cycle (need, drive, incentive, reward).

   Classification of motives.

   Abraham Maslow's theory of need hierarchy

5. Frustration and conflict

   Frustration: sources of frustration.

   Conflict: types of conflict.

   Management of frustration and conflict.

**UNIT-II**

1. Emotions

   Three levels of analysis of emotion (physiological level, subjective state, and overt behaviour).

   Theories of emotion

   Stress and management of stress.

2. Intelligence

   Theories of intelligence.

   Distribution of intelligence.

   Assessment of intelligence

3. Thinking

   Reasoning: deductive and inductive reasoning

Problem solving: rules in problem solving (algorithm and heuristic)

Creative thinking: steps in creative thinking, traits of creative people.

4. Learning

   Factors effecting learning.

   Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.

   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.

5. Personality

   Approaches to personality: type & trait, behaviouristic, psychoanalytic and humanistic approach.

   Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.

   Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.

6. Social psychology

   Leadership: Different types of leaders. Different theoretical approaches to leadership.

   Attitude: development of attitude. Change of attitude.

**Psychological reactions of patient**

**Psychological reactions of patient during admission and treatment** – anxiety, shock, denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection,

Fear, withdrawal, depression, ego, concern about small matters, narrowed interest, emotional over reaction, perpetual changes, confusion, disorientation, hallucinations, delusions, illusions, anger, loss of hope.

**Reaction to loss**

Reaction to loss, death and bereavement, shock and disbelief, development of awareness, stage of acceptance.

**Stress**

Physiological and psychological changes, relation to health and sickness: psychosomatics, professional stress, burnout

**Communication**

Types – Verbal, non- verbal, elements in communication, developing effective communication, specific communication technique.

**Counselling** – Definition, aim, differentiate from guidance, principles in counselling.

**Compliance**

Nature, factors, contributing to no compliance.

**Emotional needs**

Emotional needs and psychological factors in relation to unconscious patient, handicapped patients, bed-ridden patients, chronic pain, spinal cord injury, paralysis, cerebral palsy, burns, amputation, head injury, parkinsonism, leprosy, incontinence.

**Geriatric psychology**

Specific psychological reactions and needs of geriatric patient

**Paediatric psychology**

Specific psychological reactions and needs of paediatric patients.

**Behaviour modification**

Application of various conditioning and learning principles to modify patient behaviour.

**Substance abuse**

Psychological aspects of substance abuse: smoking, alcoholism and drug addiction

**Recommended Textbooks:**


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.

| Course code B22HE0306 | BASIC NURSING & FIRST AID | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basics of nursing

.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. In this course the student will learn the basic principles and methods of nursing and first aid, with respect to basic medical care of patients

**Course Outcomes**

1. **CO1**- Interpret the theoretical knowledge of the principles of nursing care of patients.
2. **CO2**- Interpret knowledge with respect to first aid in common medical emergencies.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0306 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**UNIT-I**

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.
5. Observation of sputum, understand use and care of catheters, enema giving.
6. Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion.
7. Care of Rubber Goods: Observation, Reporting and Recording Temperature, Respiration and Pulse, Simple aseptic Technique, Sterilisation and Disinfection.
8. Surgical Dressing: Observation of dressing procedures.
9. Importance of First Aid in Physiotherapy
10. Examination of Vital Signs
11. First Aid in cardiac arrest.

**UNIT-II**

1. First Aid in Respiratory failure.
2. First Aid in Burns.
3. First Aid in Electric shock.
4. First Aid in Drowning.
5. First Aid in Spinal cord injuries.
6. First Aid in Hypovolemic Shock.
7. First Aid in Poisoning
8. Instrumentation used in First Aid (First Aid kit)
9. First Aid in RTA.
10. Indication of CPR, assessment and technique of CPR.
11. Artificial ventilation.

**Recommended Textbooks**


1. First aid in emergency – St-john. Ambulance Association.
2. Physiotherapy for burns & Reconstruction – Glassey.
3. Surgical & Medical Procedures for Nurses & Paramedical staff – Nathan.
4. First aid & management of general injuries & common ailments-Gupta & Gupta

| Course code B22HE0307 | PRACTICAL: BIOMECHANICS -I | L | T | P | C |
|---|---|---|---|---|---|
| Duration: 3 hrs./week | | 0 | 0 | 2 | 2 |

**Pre-requisites**

Students on Completion understand the basic principles of biomechanics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the biomechanics
2. To obtain knowledge regarding the basics of biomechanics

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic principles of biomechanics
2. **CO2**. Able to understand the biomechanical aspect of skeletal system

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0307 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

The demonstrations may be done on models or skeleton.

1. Analysis of joint movements
2. Analysis of posture
3. Gait analysis
4. Analysis of activities of daily living.

**Recommended Text books:**


1. Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, New Delhi.
2. Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996,1stIndian Ed 1998, Rs 250.00
3. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997, Rs 300.00

| Course code<br>B22HE0308 | PRACTICAL: EXERCISE THERAPY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:**<br>3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on Completion understand the basic principles of exercise therapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the exercise therapy
2. To obtain knowledge regarding the basics of exercise therapy

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic principles of exercise therapy
2. **CO2**. Able to understand the exercise therapy techniques

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0308 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

The following practicals to be done on a model-

1. Fundamental and derived positions
2. Active movements of peripheral joints.
3. Passive movements of peripheral joints.
4. Relaxation positions and types of relaxation.
5. Mat activities.

6. Functional re-education.
7. Hydrotherapy.
8. Posture- normal and abnormal.
9. Gait- normal and pathological.
10. Walking aids.
11. Wheel chair.
12. Breathing exercises

**Recommended Text books:**

1. Therapeutic exercise by Barbara Bandy
2. Therapeutic exercise by Carolyn Kisner
3. Principles of exercise therapy by M. Dena Gardiner
4. Practical Exercise therapy by Hollis Margaret
5. Therapeutic exercise by Sydney Litch
6. Therapeutic exercise by Hall & Brody
7. Therapeutic exercise by Basmajjian
8. Physical Rehabilitation by O'Sullivan.
9. Therapeutic massage by Sinha
10. Principles of muscle testing by Hislop

| Course code B22HE0309 | PRACTICAL: ELECTROTHERAPY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on Completion understand the basic principles of electro therapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the electro therapy
2. To obtain knowledge regarding the basics of electro therapy

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic principles of electro therapy
2. **CO2**. Able to understand the electro therapy modalities

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0309 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

1. Faradic current
2. Galvanic current
3. Electrical stimulation for the muscles supplied by the peripheral nerves
4. Faradism under Pressure for UL and LL
5. Plotting of SD curve with chronaxie and rheobase
6. F-G TEST

7. TENS
8. Iontophoresis
9. IFT
10. Bio feedback

**Recommended Text books:**

1. Claytons Electrotherapy by Forster & Plastangs
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Electrotherapy Evidence based practice by Sheila Kitchen
5. Physical agents by Michile Cameroon
6. Principles of Electrotherapy by Michile Camreeon
7. Thermal agents by Susan Michlovitz

| Course code B22HE0310 | CLINICAL POSTINGS-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **3** | **3** |

**Course Objectives**

Upon completing the clinical postings students will be able to- demonstrate competency in observation of assessment of patients undergoing physiotherapy treatment. demonstrate competency in observation of management of patients undergoing physiotherapy treatment. These skills may be obtained in the outpatient, inpatient, and long-term care settings

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0310 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

## IV SEMESTER

| Course code<br>B22HE0401 | PATHOLOGY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:**<br>2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basics of pathology.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To discuss about the history, basic concept of pathology, safety and basic histo technology
2. To reveal blood composition blood cell & plasma, coagulation factors and blood cell formation
3. To discuss about RBC, hemoglobin, oxygen dissociation curve and study of blood group
4. To explain about sectioning, staining of tissue and various types of stain.

**Course Outcomes**

1. **CO1**. Interpret knowledge gained about the history and basic concept of pathology, safety and basic histo technology, blood cell & plasma composition, coagulation factors and stage of blood cell formation.
2. **CO2**. Interpret knowledge about RBC, normal and abnormal haemoglobin, oxygen transport and blood group system, sectioning, staining of tissue and be aware about various types of stain

### Mapping of Course Outcomes with Programme Outcomes

| CourseCode | POS/ COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0401 | CO1 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| | CO2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 1 | 1 |

**Course Contents: 26 Hours**

## UNIT-I

1. Respiratory System

Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs, Occupational lung diseases

2. Cardiovascular Pathology

Congenital Heart disease: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy, Patent ductus arteriosus.

Endocarditis. Rheumatic Heart disease.

Vascular diseases: Atherosclerosis, Monck Berg's medial calcification, Aneurysm and Arteritis and tumours of Blood vessels.

Ischemic heart Disease: Myocardial infarction. Hypertension and hypertensive heart disease.

3. Alimentary tract

Oral Pathology: Ulcers, leukoplakia, Carcinoma, oral cavity diseases and tumour of salivary gland & esophagus and precancerous lesions, Esophagus inflammatory, functional disorders and tumours.

Stomach: Gastritis, Ulcer &Tumours.

Tumours and tumour like condition of the small and large Intestine: Polyps, carcinoid, carcinoma, Lymphoma.

Pancreatitis and pancreatic tumours-i) Exocrine, ii) Endocrine Salivary gland tumours: Mixed, Warthin's

4. Hepato – biliary pathology

Jaundice: Types, aetio-pathogenesis and diagnosis. Hepatitis: Acute, Chronic, neonatal.

Alcoholic liver disease

Cirrhosis: Post necrotic, Alcoholic, Metabolic and Portal Hypertension Liver abscesses; Pyogenic, parasitic and Amoebic.

Tumours of Liver

5. Lymphatic System

Diseases of the gall bladder: Cholecystitis, Cholelithiasis, Carcinoma. Lymphadenitis – Non- specific and granulomatous

Causes of Lymph Node enlargements. Reactive Hyperplasia, Primary Tumours – Hodgkin's and Non Hodgkin's Lymphomas, Metastatic Tumours. Causes of Splenic Enlargements

**UNIT-II**

6. Musculoskeletal System

Osteomyelitis, acute, chronic, tuberculous, mycetoma

Metabolic diseases: Rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease. Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma.

Arthritis: Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous.

7. Endocrine pathology

Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis

Non-neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, myxedema, Hashimoto's thyroiditis.

Tumours of Thyroid: Adenoma, Carcinoma: Papillary, Follicular, Medullary, Anaplastic. Adrenal diseases: cortical hyperplasia, atrophy, tuberculosis, tumours of cortex and medulla.

8. Neuropathology

Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess Tuberculosis, Cysticercosis

CNS Tumors, Astrocytoma, Neuroblastoma, Meningioma, Medulloblastoma

9. Dermatopathology

Skin tumors: Squamous cell carcinoma, Basal cell carcinoma, Melanoma

**Recommended Textbooks**

1. Text book of pathology: Harsh Mohan
2. General systemic pathology: Churchill Livingstone
3. Text book of Pathology: Robbins

| Course code<br>B22HE0402 | MICROBIOLOGY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:**<br>2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic of microbes, cell, staining.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To learn the fundamental aspects of mi1c1r0obiology including taxonomy and classification
2. To understand about different kinds of microscopes used in the microbiology laboratory
3. To learn about gram staining for the identification of bacteria
4. To learn about disinfection methods used to control contamination of micro-organisms.

**Course Outcomes**

1. **CO1**. Ascertain about the fundamental aspects of microbiology including taxonomy and classification, and gram staining methods
2. **CO2**. Acquire the knowledge of microscopes used in the microbiology laboratory. And disinfection methods used to control micro-organisms

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0402 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |

**Course Contents: 26 Hours**

## UNIT -I

### General Virology

General properties: Basic structure and broad classification of viruses. Pathogenesis and pathology of viral infections. Immunity and prophylaxis of viral diseases. Principles of laboratory diagnosis of viral diseases. List of commonly used antiviral agents.

### Mycology

General properties of fungi. Classification based on disease: superficial, subcutaneous, deep mycoses opportunistic infections including Mycotoxins, systemic mycoses. General principles of fungal diagnosis, Rapid diagnosis. Method of collection of samples. Antifungal agents.

## UNIT -II

### Clinical/Applied Microbiology

Streptococcal infections: Rheumatic fever and Rheumatic heart disease, Meningitis. Tuberculosis, Pyrexia of unknown origin, leprosy, Sexually transmitted diseases, Poliomyelitis, Hepatitis, Acute-respiratory infections, Central nervous System infections, Urinary tract infections, Pelvic inflammatory disease, Wound infection, Opportunistic infections, HIV infection, Malaria, Filariasis, Zoonotic diseases.

### Recommended Textbooks:


1. Short text book of Medical Microbiology by Sathish Gupta
2. Text book of Microbiology by Jayaram Panicker
3. Microbiology & Parasitology by Rajeshwar Reddy
4. Text book of Microbiology by Anantha Narayanan
5. Microbiology by Baveja

Text book of microbiology by Chakraborthy

| Course code- B22HE0403 | BIOMECHANICS-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic about the biomechanics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Biomechanics involves the study of basic concepts of human movement,
2. Application of various biomechanical principles in the evaluation and treatment of disorders of Musculoskeletal system

**Course Outcomes**

1. **CO1**- Demonstrate knowledge gained of the various methods of movements occurring in different joints of the upper limb
2. **CO2**- Demonstrate knowledge gained of the various methods of movements occurring in different joints of the lower limb.
3. **CO3** - Understand about the different type of posture and gait
4. **CO4** – Under about the lower and upper limp biomechanics

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0403 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 |
| | CO4 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 |

**Course Contents: 48 Hours**

## UNIT-I

1. Biomechanics of the Thorax and Chest wall

   General structure and function, Rib cage and the muscles associated with the rib cage, Ventilatory motions: its coordination and integration, Developmental aspects of structure and function, Changes in normal structure and function I relation to pregnancy, scoliosis and COPD

## UNIT-II

2. The Tempero mandibular Joint

   General features, structure, function and dysfunction

3. Biomechanics of the vertebral column

   General structure and function, Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region, Muscles of the vertebral column, General effects of injury and aging.

## UNIT-III

4. Analysis of Posture and Gait

   Static and dynamic posture, postural control, kinetic sand kinematics of posture, ideal posture analysis of posture, effects of posture on age, pregnancy, occupation and recreation. 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, effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and malalignments in gait; Movement Analysis: ADL activities like sitting – to standing, lifting, various grips, pinches.

## UNIT-IV

5. Applied biomechanics of upper limb
6. Applied biomechanics of lower limb

**Recommended Textbooks**

1. Therapeutic exercise by Barbara Bandy
2. Therapeutic exercise by Carolyn Kisner
3. Principles of exercise therapy by M. Dena Gardiner
4. Practical Exercise therapy by Hollis Margaret
5. Therapeutic exercise by Sydney Litch
6. Therapeutic exercise by Hall & Brody
7. Therapeutic exercise by Basmajjian
8. Physical Rehabilitation by O'Sullivan.
9. Therapeutic massage by Sinha
10. Principles of muscle testing by Hislop.

| Course code B22HE0404 | EXERCISE THERAPY – II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of previous semester about Exercise Therapy I

.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course enables the student to gain knowledge on the principles of massage, manual muscle testing
2. Also grading, muscle strengthening and re-education, joint mobilization, resisted exercises, stretching, balance exercises, PNF techniques, goniometry, suspension therapy, co-ordination exercises, Chest physiotherapy, group exercises and traction

**Course Outcomes**

1. **CO1**- Interpret knowledge gained on the various methods and techniques of exercise therapy in the management of patients with Musculo skeletal disorders and dysfunctions.
2. **CO2**- Select the right type of method of exercises for treatment of such patients.
3. **CO3** – Understand about the goniometer and their application
4. **CO4** – Understand about the group of exercise and traction system

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0404 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 |
| | CO4 | 3 | 1 | 2 | 2 | 3 | 2 | 3 | 1 | 1 | 3 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

MASSAGE

History, classification, physiological effects of Massage on various body systems, therapeutic application of Massage & sports massage

1. History of massage
2. Definition of massage
3. Mechanical points to be considered

(Manipulation, time of day for treatment, comfort and support of patient-positioning, Draping, bolstering, position of operator, using body weight, contact and continuity)

Technique –Indications and contraindication

Classification of massage

Based on character of Technique-

Stroking manipulation

Pressure manipulation

Vibratory manipulation

Tapotement or Percussion manipulation

Based on depth of tissue reached-

Light massage

Deep massage

Based on parts of body massaged-

General massage

Local massage

Based on means of application of pressure-

Manual massage

Mechanical massage

Physiological effects of massage on various body systems

(Effect on-circulatory system, excretory system, muscular system, nervous system Metabolic system, respiratory system, skin)

MASSAGE TECHNIQUE

Stroking manipulation- Superficial stroking, deep stroking or Effleurage

Pressure manipulation-

A. Kneading-palmer &digital kneading, ironing

B. Petrissage-picking up, wringing, skin rolling

C. Friction-circular& transverse friction

Percussion manipulation-

Clapping, hacking, beating, pounding, tenting Contact heel percussion

Vibratory manipulation-vibratory& shaking

TECHNIQUES USED FOR VARIOUS PARTS OF BODY

Massage for upper limb-scapular region, shoulder joint, upper arm, elbow joint, Forearm, wrist joint, hand

Massage for lower limb-thigh, knee joint, leg, foot (ankle & toes)

Massage for back-neck and upper back, middle and lower back, gluteal region

Massage for face and abdomen

SPORTS MASSAGE

Introduction, role of massage in sports

Massage manipulations-stroking, effleurage, petrissage, acupressure, tapotement, Vibration, shaking

Ice massage

Categories of sports massage-pre event massage, intermediate massage, post Event massage

THERAPEUTIC APPLICATION OF MASSAGE

1. Relaxation
2. Oedema
3. Radical mastectomy
4. Venous ulcer
5. Painful neuroma
6. Bell's palsy
7. Sprain and Strain
8. Fibrositis.

MUSCLE GRADING/MANUAL MUSCLE TESTING

1. Introduction
2. Principles
3. Uses
4. Precaution & Contraindication

5. Types of muscle grading

(According to muscle power-Grade I to Grade V)

Available ROM method

Make or Break test Active resistance test Grading system

Medical Research Council (MRC) Plus & Minus grade

Daniels &Worthingham Kendall & Kendall Demonstrate the skill to grade Upper limb muscle, Lower limb muscle Trunk muscle

MUSCLE STRENGTHENING/RE-EDUCATION OF MUSCLES

1. Definition
2. Demonstrate various re-education techniques on different group of muscles of Upper extremity, lower extremity, trunk.
3. Demonstrate the progressive exercise in strengthening using various methods.

**UNIT-II**

RESISTED EXERCISE

1. Definition
2. Types of resisted exercise-Manual & Mechanical
3. Manual-Definition, principle, technique by therapist & patient
4. Mechanical-Definition, principle, technique by weights, pulleys, spring
5. Uses of resisted exercise
6. Progressive resisted exercise

   Definition

   Repetition maximum (RM) method Delorme & Watkins

   Mac queen

   Zinovieff (oxford technique)

JOINT MOBILIZATION

1. Introduction
2. Definition
3. Joint range-Outer range, Middle range, Inner range
4. Causes of joint range limitation
5. Effect of prolonged immobilization
6. Indication & Contraindication

7. Principles Position of patient Position of therapist Relaxation
8. Fixation
9. Support or Stabilization
10. Direction of movement
11. Force & Range / Distraction or Traction Intensity & Duration
12. Methods of peripheral joint mobilization Muscle relaxation techniques
13. Free exercise Hold relax Contract relax
14. Muscle stretching techniques
15. Forced passive movement
16. Passive stretching / self-stretching Mechanical stretching Oscillatory technique
17. Sustained translatory joint play techniques.

STRETCHING

1. Definition
2. Indication & Contraindication
3. Purpose of stretching
4. Physiological changes in muscle to stretch
5. Neurological changes in muscle to stretch
6. Types of stretching
   Passive
   Active or self-stretching
7. PNF
8. Ballistic stretching Dynamic
9. Isometric

1. Lower extremity muscle stretching

Illiacus & psoas major, adductor, hamstring, Tensor fascia latae, quadriceps, Tendo Achilles (gastrocnemius & sole us), Piriformis, Tibialis anterior, Peroneus longus, Peroneus brevis, EHL, EDL, EDB

2 Trunk & Upper extremity stretching

Low back extensors, Levator scapulae & upper fibers of trapezius,

Middle fibers of trapezius & Rhomboids major and minor, Pectoralis major, Supraspinatus, Subscapularis, Infraspinatus & teres minor, Latissimus dorsi Elbow flexors-biceps, Elbow extensors-triceps, Wrist extensors, Wrist

Flexors, Common extensors-ECRL, ECRB, ECV, ED, Wrist & finger flexors- FCR, FCU, FDS, FDP, Intrinsic muscles of hand.

## UNIT-III

GONIOMETRY

1. Definition
2. Normal range of motion of joints
3. Types of goniometer
4. Universal goniometer
5. Gravity dependent goniometer or fluid goniometer Pendulum goniometer
6. Electro goniometer
7. Procedure or steps in joint range measurement
8. Demonstrate measuring of individual joint range using goniometer
9. Shoulder joint, elbow joint, radioulnar joint, wrist joint, MCP joint, PIP joint, Hip joint, Knee joint, ankle joint, subtalar joint
10. End feel-Normal & Pathological Precaution & Contraindication

SUSPENSION THERAPY

1. Definition
2. Principle Friction Pendulum
3. Eliminating gravity movement Advantages & Disadvantages
4. Suspension Instruments Suspension frame Supporting ropes, Pulleys Slings
5. S-hook and dog clip Wooden cleat, Procedure
6. Types of suspension Axial suspension Vertical suspension, Pendular suspension
7. Demonstrate suspension therapy for upper extremity & lower extremity
8. Upper extremity- shoulder Flexion, Extension, Medial Rotation, Lateral Rotation, Abduction, Adduction, elbow Flexion, Extension
9. Lower extremity- Hip Flex, Extension, Abduction, Adduction, Medial Rotation, Lateral Rotation, knee Flexion, Extension

BALANCE EXERCISES

1. Definition
2. Cause of balance disorder Condition
3. Evaluation Balance exercise

4. Balance evaluation
5. Romberg test Hall pike test
6. Functional reach test
7. Balance exercise
8. Exercise for weakness
9. Exercise for movement strategies Static balance exercise
10. Dynamic balance exercise
11. Balance exercise for vestibular dysfunction

**UNIT-IV**

CO- ORDINATION EXERCISES

1. Definition
2. Causes of co-ordination disorder Condition
3. Tests for co-ordination exercise
4. Co-ordination test

   Standing Walking

   Sitting or Supine Finger to nose

   Finger to therapist finger Finger to finger Alternate nose to finger Finger opposition Pronation /Supination Alternate heel to knee

   Drawing an imaginary circle on air with UE & LE Position holding

   Rebound test
5. Co-ordination exercise

   Frenkel exercise in Supine, Sitting, Walking

   Functional activity retraining

   Brushing Combing hair

   Pick up small object from table or floor Practice writing

   Draw numbers or alphabets

CHEST PHYSIOTHERAPY

Definition Physiological basis Classification Vibration or Shaking Percussion or Clapping Describe the complications to patients due to Prolonged bed rest/ demonstration, maintenance exercise for patients on prolonged bed rest

GROUP EXERCISE

1. Introduction
2. Advantages & Disadvantages
3. Indication
4. Formation of group
5. Space
6. Selection of patients Number of patients Instruction to patients Group type
7. Type of exercise

TRACTION

1. Definition
2. Mechanism of action of traction Indication & Contraindication of traction Types of traction
3. Based on methods of application
   Manual
   Mechanical
4. Positional Inversion Hydraulic
5. Based on nature of pull –
   Continuous traction
   Sustained traction
   Intermittent traction
6. Based on regions applied
   Cervical traction
   Lumbar traction/Pelvic traction
7. Traction parameters - (Weight, Time, Hold, Relax)

PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION (PNF)

1. Introduction Definition Principles Pattern of motion Diagonals
2. Motion components
3. Basic procedure
4. Agonist & Antagonist Traction & Approximation Normal timing
5. Stretch stimulus Stretch reflex Manual contact
6. Command & Communication Line of movement

7. PNF patterns for Upper Extremity: D1 Flexion, D1 Extension, D2 Flexion, D2 Extension
8. PNF pattern for Lower Extremity: D1 Flexion, D1 Extension, D2 Flexion, D2 Extension Demonstrate PNF Technique
9. Repeated contractions Slow reversals Rhythmic stabilization Hold relax
10. Rhythmic initiation

**Recommended Textbooks**


1. Therapeutic exercise by Barbara Bandy
2. Therapeutic exercise by Carolyn Kisner
3. Principles of exercise therapy by M. Dena Gardiner
4. Practical Exercise therapy by Hollis Margaret
5. Therapeutic exercise by Sydney Litch
6. Therapeutic exercise by Hall & Brody
7. Therapeutic exercise by Basmajjian
8. Physical Rehabilitation by O'Sullivan.
9. Therapeutic massage by Sinha
10. Principles of muscle testing by Hislop.

| Course code B22HE0405 | ELECTROTHERAPY – II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of electrotherapy and low frequency

.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

The student will learn the principles, technique and effects of electrotherapy as a therapeutic modality in the restoration of physical function.

**Course Outcomes**

1. **CO1**- list the indications and contraindications of various types of high frequency electrotherapy modalities.
2. **CO2**- demonstrate the different techniques, and describe their effects and uses, contra indications.
3. **CO3**- select the right high frequency modality in the treatment of patients.
4. **CO4**- select the proper use of moist heat and cryotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0405 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 2 | 2 | 2 | 2 |
| | CO4 | 3 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 3 |

**Course Contents: 48 Hours**

## UNIT-I

SHORT WAVE DIATHERMY

1. Definition
2. Principle of working
3. Indication & contraindication of SWD
4. Bio-physics of deep heating using SWD
    a. Capacitor or condenser field method
    b. Inductance or Magnetic field method
5. Production
6. Construction-
    a. Machine circuit or Oscillator circuit
    b. Patient circuit or Resonator circuit
7. Mechanism of production of SWD
8. Indications for circuits to be in tune
9. Transmission of shortwave in to tissues
10. Technique or Method of application of SWD
11. Preparation of equipment (warming, tuning, testing of machine)
12. Application of treatment-
    Condenser field method/Capacitor field method
    Cable method/Inductothermy
13. Condenser field method

    Type of electrode

    Size of electrode

    Electrode spacing-Wide & Narrow spacing

    Electrode positioning –

    Co-planar

    Contra planar

    Mono planar

    Cross fire method
14. Cable field method

    Electrode

    Electrostatic field & Magnetic field

    Advantage

Dosage

15. Dangers of SWD
16. Precautions and contraindication of SWD

Pulsed Short-Wave Diathermy

1. Definition, Frequency, Wavelength
2. Production
3. Parameters-1. Pulse repetition rate (PRR)
4. Pulse duration (PD)
5. Peak pulse power (PPP)
6. Physiological effect
7. Indication & contraindication
8. Dosage

MICRO WAVE DIATHERMY

1. Definition
2. Bio-physics of micro wave diathermy
3. Indication & contraindication of MWD
4. Production of MWD (Magnetron)
5. Technique of application of MWD
   Patient preparation
   Selection of treatment applicator
   Selection of appropriate power level and application of treatment
6. Dosage
7. Physiological & Therapeutic effects
8. Dangers

**UNIT-II**

ULTRASOUND THERAPY

1. Definition
2. Bio-physics of ultrasound
3. Indication & contraindication of ultrasound
4. Properties of ultrasound-Reflection, Transmission, Absorption
5. Ultrasonic field

6. Coupling media
7. Production of ultrasound
8. Technique of application of ultrasound
9. Testing of machine
10. Application of ultrasound
    Direct contact method
    Water bath method
    Water bag method
11. Treatment parameters
    Intensity
    Mode-Continuous or Pulsed
    Frequency-1 MHz or 3 MHz
    Treatment duration
    Pulsed mark: Space ratio
12. Dosage
13. Physiological & Therapeutic effects of ultrasound 3 Dangers of ultrasound

PHONOPHORESIS

1. Definition
2. Principle of working
3. Drugs used in phonophoresis
4. Techniques of application of phonophoresis
5. Contraindication

ACTINOTHERAPY A-BASICS

1. Define heat and temperature
2. Physical effect of heat
3. Transmission of heat
4. Radiation energy and its properties
5. Electro magnetic spectrum
6. Laws governing radiation
7. Skin-Structure, Depth of penetration, Functions

INFRARED RADIATIONS

1. Definition
2. Production-Types of generators (Luminous & Non-Luminous), Working
3. Indication & Contraindication
4. Physiological & Therapeutic effect of IRR
5. Dangers
6. Technique of treatment
7. Choice of apparatus
8. Arrangement of lamp and patient
9. Preparation of patient
10. Application of treatment
11. Treatment frequency and duration

**UNIT-III**

ULTRA VIOLET RADIATION

1. Definition
2. Classification
3. Production of UVR

   Mercury vapour lamp-

   Air cooled medium pressure Mercury vapor lamp(Alpine Sun Lamp)

   Water cooled medium pressure Mercury vapor Lamp (Kromayer Lamp)

   Fluorescent Tube (Theraktin Tunnel)

   Tridymite formation
4. Cooling of lamp
5. Technique or principle of application of treatment
6. Preparation of patient
7. Preparation of apparatus
8. Setting up
9. Application
10. Progression
11. Dosage
12. Test dose
13. Calculation of progression of dosage PUVA apparatus
14. Care of lamp

15. Sensitizers, Photosensitization, Filters Erythema, Pigmentation, Penetration Indication & Contraindication
16. Physiological effect & Therapeutic effect of UVR
17. Demonstrate of UVR for following conditions
18. Acne - shoulder & chest, back & chest, Alopecia aereata & totalis, Psoriasis, ulcer Pressure sore, Rickets, General body bath

LASER

1. Definition
2. Properties of laser
   Monochromaticity
   Coherence
   Collimation
3. Production of laser
   Lasing medium
   Resonating chamber
   Energy source
4. Types of laser
   Ruby laser or crystal laser
   Helium-neon laser or gas laser
   Diode laser or semiconductor laser
5. Technique of application
   Grid method
   Scanning method
6. Dosage parameters
   (Area of treatment, energy density, pulse repetition rate, power output, irradiation) 5 Indications & Contraindications
7. Physiological effect & Therapeutic effect
8. Dangers

**UNIT-IV**

SUPERFICIAL HEAT MODALITIES

Moist hot packs-Definition, Working, Technique of application

Hydro collator pack-Definition, Apparatus, working, Technique of application 3 Paraffin wax bath-Definition, apparatus, Technique of application

Whirl pool bath-Definition, apparatus, Technique of application

Hubbard tank-Definition, apparatus, Technique of application

CRYOTHERAPY

1. Definition Biophysics
2. Indication & contraindication
3. Technique of application
   - Ice pack
   - Ice massage
   - Cold pack
   - Cold whirlpool
   - Cryo-cuff
   - Cold spray
   - Cryo stretch
   - Cryo kinetics
4. Contrast bath-Definition, Principle, Technique of treatment, indication, contraindication.

**Recommended Textbooks**


1. Claytons Electrotherapy by Forster & Plastangs
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Electrotherapy Evidence based practice by Sheila Kitchen
5. Physical agents by Michile Cameroon
6. Principles of Electrotherapy by MichileCamreeon
7. Thermal agents by Susan Michlovitz

| Course code- B22HES411 | BASICS OF RADIOLOGY | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

The student must have knowledge of anatomy of human body.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To enhance functional communication skills.
2. To develop functional use of language in professional contexts.
3. To utilize oral presentations in multiple contexts.
4. To apply effective written skills in formal communication.

**Course Outcomes**

1. **CO1**- Identify various modalities of Radiology along with basics of Working physics
2. **CO2**- Acquire knowledge of Radiographic anatomy in the X-ray, CT and MRI

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HES411 | CO1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 3 |

**Course Contents: 24 Hours**

**UNIT-I**

Modalities of Radiology

Introduction to X-ray, CT and MRI

X-ray: Basics Principles of X-ray, Positioning: Routine Various views taken for Sports Injury, Post traumatic Injury etc

CT: Basic Principle and Various techniques, MRI: Basic Principle and Various techniques

## UNIT-II

Modalities of Radiology

X-ray: Radiographic Anatomy of Chest, Upper Limb, Lower Limb, Spine.

CT: Post processed Spotters of CT image of Bones and Radiographic anatomy of MRI: Radiographic Anatomy of MR Brain, MSK- MR: Shoulder & knee.

| Course code- B22HES412 | FOOD & NUTRITION | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | 2 | 0 | 0 | 2 |

**Pre-requisites**

Knowledge of basic concept of food, Nutrients.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the functions and role of nutrients, their requirements and the effect of deficiency and excess (in brief)
2. To understand the concept of an adequate diet and the importance of nutrients in recommended Dietary Allowances, Estimated Average Requirement (EAR).

**Course Outcomes**

3. **CO1**: Understand the functions and role of different nutrients, their role in making foods choices and obtaining an adequate diet.
4. **CO2**: Able to apply basic nutrition knowledge on macronutrients, their requirements and the effect of deficiency and excess

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HES412 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |

**Course Contents: 24 Hours**

## UNIT-I

Science of Nutrition, Concept of Nutrition- Definition of nutrition, health, nutritional status and Malnutrition. Food Adulteration, Food Laws, Food Guide, RDA- Definition, factors affecting RDA and methods used for deriving RDA, concept of EAR and my plate. Carbohydrates - Definition, composition, functions, maintenance of blood sugar levels,

requirement, sources, digestion and absorption; Dietary fiber- Definition, classification, physiological effects and sources.

## UNIT-II

Proteins- Definition, composition, nutritional classification of proteins and amino acids, functions, sources, requirements, digestion and absorption. Evaluation of protein quality: PER, BV, NPU and Chemical score. Lipids- Definition, composition, functions, sources, requirements, digestion and absorption. Essential fatty acids – Definition, functions, sources and effects of deficiency

**Recommended Textbooks**


1. Sumathi R. Mudambi, Rajagopal, M.V., Fundametals of Foods and Nutrition, New Age International (P) Ltd, Publishers, Third edition, 1997.
2. Srilakshmi B., Nutrition Science, New Age Internati1o2n8al (P) Ltd, Publishers, Fifth multi colour edition, 2016.
3. Mangala Kango, Normal Nutrition, Curing diseases through diet, CBS Publications, First edition, 2005.
4. Paul.S., Text Book of Bio-Nutrition, Fundamental and Management, RBSA Publishers, 2003.
5. Sue Rodwell Williams, Nutrition and Diet Therapy, C.V. Melskey Co., 6th edition, 2000.
6. Mahtab. S.Bamji, Kamala Krishnaswamy and G.N.V Brahmam, Text Book of Human Nutrition, Oxford and IBH Publishing Company, Third Edition. 2009.
7. ICMR short report on RDA and EAR 2020.

| Course code- B23HE0406 | PRACTICAL: BIOMECHANICS -II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on Completion understand the basic principles of biomechanics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the biomechanics of human body
2. To obtain knowledge regarding the basics of body mechanics

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic principles of biomechanics
2. **CO2**. Able to understand the body mechanics

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0406 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

The students will be demonstrated and made to practice on models in batches the biomechanical analysis of following joints-

1. Shoulder joint
2. Elbow joint
3. Wrist and hand complex
4. Hip joint

5. Knee joint
6. Ankle foot complex

Goniometry

Walkling Aids

Gait – Pathological gaits

ADL

Analysis of posture

1. Sagittal plane
2. Frontal plane

**Recommended Text books:**


1. Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, New Delhi.
2. Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996,1stIndian Ed 1998, Rs 250.00
3. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997, Rs 300.00

| Course code B22HE0407 | PRACTICAL: EXERCISE THEAPY -II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on Completion understand the basic principles of exercise therapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

3. To understand the effects of exercises on human body
4. To obtain knowledge regarding the basics of exercise & exercise protocols

**Course Outcomes**

3. **CO1**. Ready to demonstrate the basic principles of exercise therapy
4. **CO2**. Able to understand the exercise & protocols

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0407 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

The students will be demonstrated and made to practice on models in batches the following techniques-

1. Demonstrate mobilization of individual joint regions
2. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles; types of suspension.
3. Demonstrate the techniques for muscle stretching

4. Demonstrate techniques of strengthening muscles using resisted exercises
5. Demonstrate techniques for measuring limb length and body circumference.
6. Demonstrate massage techniques for UL, LL, back, face and scalp regions; Sports massage technique.
7. Demonstrate manual muscle testing for peripheral joint muscles.
8. Demonstrate muscle strengthening and re-education techniques.
9. Demonstrate principles of goniometry for measuring joint range of motion.
10. Chest physiotherapy manipulations.
11. Balance exercises.
12. Co-ordination exercises.
13. Traction- types and uses.
14. PNF techniques and uses.
15. Group exercises

**Recommended Text books:**


1. Therapeutic exercise by Barbara Bandy
2. Therapeutic exercise by Carolyn Kisner
3. Principles of exercise therapy by M. Dena Gardiner
4. Practical Exercise therapy by Hollis Margaret
5. Therapeutic exercise by Sydney Litch
6. Therapeutic exercise by Hall & Brody
7. Therapeutic exercise by Basmajjian
8. Physical Rehabilitation by O'Sullivan.
9. Therapeutic massage by Sinha
10. Principles of muscle testing by Hislop.

| Course code- B22HE0408 | PRACTICAL: ELECTROTHERAPY PRACTICALS-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Students on Completion understand the basic principles of electro therapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the effects of electrotherapy modalities on human body
2. To obtain knowledge regarding the basics of electrotherapy & treatment methods

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic principles of electro therapy
2. **CO2**. Able to understand the electrotherapy & protocols

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0408 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions-

1. Application of Ultrasound for different regions-various methods of application.
2. Demonstrate treatment techniques using SWD.
3. Demonstrate treatment techniques using IRR and MWD.

4. Demonstrate the technique of UVR exposure for various conditions – calculation of test dose.
5. Calculation of dosage and technique of application of LASER.
6. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath, wax therapy
7. Demonstrate the treatment method using whirl pool bath.
8. Winding up procedure after any electrotherapy treatment method

**Recommended Textbooks**


1. Claytons Electrotherapy by Forster & Plastangs
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Electrotherapy Evidence based practice by Sheila Kitchen
5. Physical agents by Michile Cameroon
6. Principles of Electrotherapy by MichileCamreeon
7. Thermal agents by Susan Michlovitz

| Course code B22HE0409 | CLINICAL POSTINGS-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **3** | **3** |

**Course Objectives**

Upon completing the clinical postings students will be able to- demonstrate competency in observation of assessment of patients undergoing physiotherapy treatment. demonstrate competency in observation of management of patients undergoing physiotherapy treatment. These skills may be obtained in the outpatient, inpatient, and long-term care settings

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0409 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |

## V SEMESTER

| Course code B22HE0501 | PHARMACOLOGY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic of pharmacology.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course introduces the student to the basic pharmacology of common drugs used, and their importance in the overall treatment including Physiotherapy.
2. The student after completing the course will be able to understand the general principles of drug action and the handling of drugs by the body.
3. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment.

**Course Outcomes**

1. **CO1**- Interpret knowledge gained in the drugs used in the treatment of diseases affecting the various systems of the body
2. **CO2**- Must be able to interpret knowledge regarding the actions of drugs, and their side effects.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0501 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |

**Course Contents: 26 Hours**

## UNIT-I

### General Pharmacology

Introduction, Definitions, Classification of drugs, Sources of drugs, routes of drug administration, Absorption, Distribution of drugs, Metabolism, and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Drug Interactions Factors modifying drug response, Adverse effects.

### Autonomic Nervous system

General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous system Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

### Cardiovascular Pharmacology

Drugs Used in the Treatment of Heart Failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct-acting Vasodilators

Antiarrhythmic Drugs, Drugs Used in the Treatment of Vascular Disease and Tissue Ischemia: Vascular Disease, Hemostasis Lipid-Lowering agents, Antiplatelets, Anticoagulants and Thrombolytics, Ischemic Heart Disease –

Nitrates, Beta-Blockers, Calcium Channel Blockers Cerebral Ischemia, Peripheral Vascular Disease.

## UNIT-II

### Neuropharmacology

Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines Antianxiety Drugs: Benzodiazepines, Other Anxiolytics

Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium

Antipsychotic drugs

### Disorders of Movement

Drugs used in Treatment of Parkinson's Disease Antiepileptic Drugs

Spasticity and Skeletal Muscle Relaxants

### Inflammatory/Immune Diseases

Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Non- aspirin NSAIDs, drug Interactions with NSAIDs

Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids

Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout

**Recommended Textbooks**


1. Lippincott's Illustrated Reviews. Pharmacology
2. Essential of Medical Pharmacology by Tripathi
3. Pharmacology for Physiotherapy by Padmaja Udaykumar.
4. Pharmacology & Pharmacotherapeutics by Satoskar, S.D Bhandrakar
5. Goodman &Gilman's The Pharmacological Basis of Therapeutics

| Course code B23HE0502 | CARDIO RESPIRATORY PHYSIOTHERAPY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of cardiology & pulmonary.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course serves to integrate the knowledge gained by the students in clinical cardio respiratory conditions with the skills gained in exercise therapy, electro therapy and massage,
2. Thus, enabling them to apply these in clinical situations of dysfunction due to pathology in the cardio-respiratory pathology.

**Course Outcomes**

1. **CO1**-Identify disability due to cardio-respiratory dysfunction. Set treatment goals
2. **CO2**-Apply their skills in exercise therapy, electro therapy and massage in clinical situation to restore cardio- respiratory function.
3. **CO3** –Understand the subjective and functional assessment
4. **CO4** - Understand the lungs disease and related problem

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0502 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 2 |
| | CO4 | 2 | 3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 2 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

**Basics of Respiratory System**

1. Broncho pulmonary segments
2. Respiratory unit
3. Muscles of respiration
4. v/q ratio
5. Anatomical dead space and Physiological dead space
6. Pulmonary defense mechanism
7. Mechanics of breathing
8. Surface anatomy of lungs
9. Lung volumes and Lung capacities
10. PFT and Pulmonary Radiographs
11. Arterial Blood Gas Analysis

## UNIT-II

**Basics of Cardiac System**

1. Coronary circulation
2. Conductive system of heart
3. Cardiac cycle
4. ECG and Other Laboratory Investigations
5. Normal and Abnormal Rhythm
6. Echocardiography
7. Cardiac Radiology and Catheterization
8. Holter Monitoring

## UNIT-III

1. Evaluation and functional physiotherapy assessment with appropriate reasoning for implementation of chosen treatment technique.
2. Subjective assessment – chief complaints, history
3. Functional assessment – ADL assessment
4. Objective assessment – physiotherapy assessment of cardiothoracic condition

## UNIT-IV

1. Obstructive lung disease – Chronic bronchitis and Emphysema
2. Bronchiectasis
3. Bronchial asthma
4. Lung abscess
5. Chest Infections - Pneumonia
6. Restrictive lung disease – OLD, Chest wall deformities,
7. Pulmonary Surgery – Pneumonectomy, Lobectomy, Segmentectomy
8. Pre-operative and post-operative PT management.
9. Coronary artery diseases– IHD, MI, Heart failure
10. Hypertension
11. Cardiac surgery – CABG, PTCA
12. Pre-operative and Post-operative PT management

**Recommended Textbooks**


1. Tidy's physiotherapy.
2. Cash’s Text Book of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley.
6. Essentials of Cardio Pulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardio pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash’s Text book of General Medicine and Surgical conditions for Physiotherapists.
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey
12. Physiotherapy in Obstetrics and Gynecology by Polden

| Course code- B22HE0503 | PHYSIOTHERAPY IN MUSCULO SKELETAL &SPORTS-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of physiotherapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

Integrate the knowledge gained by the students in clinical orthopedics with the skills gained in exercise therapy, electro therapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the musculoskeletal system.

**Course Outcomes**

1. **CO1**- identify disability due to musculoskeletal dysfunction.
2. **CO2**- set treatment goals and apply their skills in exercise therapy, electro therapy and massage in clinical situation to restore Musculo skeletal function.
3. **CO3** – understand the manual therapy, pathophysiology and infective condition
4. **CO4** - understand cerebral palsy, poliomyelitis, leprosy and amputation.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0503 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 35 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 1 | 2 |
| | CO4 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 3 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

1. PT assessment for Orthopaedic conditions – SOAP format. Subjective – history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness.

   Pain assessment- intensity, character, aggravating and relieving factors, site and location.

   Objective- on observation – body build swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances.

   On examination – ROM – active and passive, resisted isometric tests, limb length-apparent, true and segmental, girth measurement, muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records, and follow up.

2. Fractures – types, classification, signs and symptoms, complications. Fracture healing – factors affecting fracture healing. Principles of fracture management – reduction – open and closed, immobilization – sling, cast, brace, slab, traction – manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing.

## UNIT-II

3. Delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases.

   Aims of PT management in fracture cases - short- and long-term goals.

   Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.

4. Specific fractures and dislocations: PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and dislocations including pelvis. PT assessment and management spinal fractures.
5. Selection and application of physiotherapeutic techniques, manoeuvre's, modalities for preventive, curative and rehabilitative means in all conditions.

**UNIT-III**

6. Principles of various schools of thought in manual therapy. (Briefly Maitland and Mc Kenzie).
7. Pathophysiology, radiological features, deformities, medical, surgical management-describe the PT assessment and management and home program for the following conditions – Osteoarthritis – emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritis shoulder.
8. Infective conditions: Definition, signs and symptoms, clinical features, pathophysiology radiological features, medical, surgical management. Describe PT assessment and management for following conditions

   – Osteomyelitis – acute and chronic, Septic arthritis, Pyogenic arthritis, TB spine and major joints - knee and hip.

9. Define, review the postural abnormalities of spinal column, clinical features, deformities, medical and surgical management. Describe PT assessment and management and home program.
10. Deformities: Review in detail the causes, signs and symptoms, radiological features, medical and surgical management. Describe the PT. assessment and management of the following conditions: Congenital: CTEV, CDH, Torticollis, pes planus, pes cavus and other common deformities. Acquired: scoliosis, kyphosis, coxa vara, genu varum, valgum and recurvatum.

**UNIT-IV**

11. Cerebral palsy: Definition, etiology, classification, clinical features, complications, deformities, medical and surgical management and home program with special emphasis on carrying techniques. PT management after surgical corrections.

12. Poliomyelitis: Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management. PT. assessment and management after surgical corrections and reconstructive surgeries - emphasis on tendon transfer and home program.
13. Leprosy: Definition, cause, clinical features, medical and surgical management. PT assessment, aims, and management after surgical procedures such as tendon transfer both pre and post operatively.
14. Amputations: Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management.

**Recommended textbooks:**


1. Tidy's physiotherapy.
2. Textbook of orthopedics- Cash.
3. Clinical orthopedic rehabilitation- Brotzman.
4. Orthopedic physiotherapy - Jayant Joshi.
5. Physical Rehabilitation Assessment and Treament – O'Sullivan Schmitz
6. Sports physiotherapy- Maria Zuluaga

| Course code- B22HE0504 | CLINICAL ORTHOPAEDICS | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of orthopedics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Following the basic science and clinical sciences course introduce the student to the Orthopedic conditions which commonly cause disability.
5. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by orthopedic pathology on the functioning of the individual

**Course Outcomes**

1. **CO1**-demonstrate an understanding of orthopaedic conditions causing disability
2. **CO2**- interpret clinical findings of orthopaedics and suggest medical and surgical management for the orthopaedic conditions.
3. **CO3** - understand the amputation, bone, joint infection and chronic arthritis.
4. **CO4** - understand jaw pain, spinal deformities, poliomyelitis, congenital, hand and nerve injuries.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0504 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 1 | 3 | 2 | 2 |
| | CO4 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

INTRODUCTION TO ORTHOPAEDICS

1. Introduction to orthopaedic terminology
2. Clinical examination.
3. Common investigations
4. Principles of management

PRINCIPLES OF OPERATIVE TREATMENT

1. Indications
2. Contraindications
3. Outline principles of: arthrodesis, Arthroplasty, Osteotomy, Bone grafting, Tendon Transfers.

SOFT TISSUE LESIONS

1. Sprains and Muscle strains
2. Capsulitis
3. Bursitis
4. Tenosynovitis
5. Fasciitis
6. Tendonitis

FRACTURES AND DISLOCATIONS

1. Types of fractures including patterns, open and closed fractures – dislocations.
2. Difference between dislocation and subluxation
3. General and local signs & symptoms of fractures, dislocations
4. Principles of management of fracture, dislocations
5. Prevention and treatment of complication – VIC, Sudeck's atrophy, carpal tunnel syndrome, myositis ossificans, shoulder-hand syndrome.
6. Fracture healing

## UNIT-II

UPPER LIMB FRACTURES

1. Enumerate major long bone fracture and joint injuries
2. Briefly describe their clinical features, principles of management, complications.

LOWER LIMB FRACTURES

1. Enumerate major long bone fracture and joint injuries
2. Briefly describe their clinical features, principles of management, complications.

SPINAL FRACTURES

1. Outline the mechanism, clinical features, principles of management, complications.

DISLOCATIONS

1. Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and hip

## UNIT-III

AMPUTATIONS

1. Classify amputations, list indication of surgery
2. Principles of amputation
3. Principles of management
4. Complications and management

BONE AND JOINT INFECTIONS

1. Outline the etiology, clinical features, management, complications septic arthritis
2. Osteomyelitis, tuberculosis – including spinal TB.

BONE AND JOINT TUMORS

1. Classify and outline the clinical features, management and complications of the following: Benign and malignant bone tumor, osteoma, osteosarcoma, osteoclastoma, Ewing sarcoma, multiple myeloma.

CHRONIC ARTHRITIS

1. Outline the pathology, clinical features, mechanism of deformities, management and Complications of – RA, OA, AS.

**UNIT-IV**

LOW BACK PAIN

1. Definition, causes of low back ache, clinical findings, assessment, management

SPINAL DEFORMITIES

1. Classify spinal deformities and outline the salient clinical features, management and complication

POLIOMYELITIS

1. Describe the pathology, clinical features, pathology, prevention, management,
2. Residual problems of polio, treatment of residual paralysis,
3. Principles of muscle transfers

CONGENITAL DEFORMITIES

1. Outline the clinical features and management of CTEV, CDH, Flat foot, vertical talus, limb deficiency – radial club hand, femoral, tibial, fibular deficiency, meningomyelocele, arthrogryposis multiplex congenital, osteogenesis imperfecta.

PERIPHERAL NERVE INJURIES

Outline the clinical features, management, and reconstructive surgery of

1. Radial, median and ulnar nerve lesions
2. Sciatic and lateral popliteal nerve lesions
3. Brachial plexus injuries including Erb;s palsy, Klumpke’s palsy, crutch palsy.

HAND INJURIES

1. Outline the clinical features, management and complications of Tendon, bone, and joint Injury.

LEPROSY

1. Outline clinical features, management and complications of neuritis, muscle paralysis, Tropic ulcer of hand and feet deformities.

**Recommended textbooks:**

1. Outline of Fractures—John Crawford Adams.
2. Outline of Orthopedics.— John Crawford Adams.
3. Text book of Orthopedics.—Maheshwari.
4. Apley's Orthopedics.
5. Textbook of Orthopedics and Traumatology— M. N. Natarajan**.**

| Course code B22HE0505 | GENERAL MEDICINE | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of medicine.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Following the basic science and clinical sciences course introduce the student to the Orthopedic conditions which commonly cause disability.
2. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by orthopedic pathology on the functioning of the individual.

**Course Outcomes**

1. **CO1**-intepret knowledge gained in the study of medical conditions and describe clinical features and diagnosis for those conditions.
2. **CO2**- interpret knowledge gained in the study of medical management of the conditions.
3. **CO3** - understand the respiratory related disease and skin related.
4. **CO4** - understand paediatric related problem and psychiatric disorder.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0505 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO4 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 1 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

1. Infection: Effects of Infection on the body – Pathology – source and spread of infection – vaccinations, generalized infections – rashes and infection – food poisoning and gastro enteritis – sexually transmitted diseases

   – HIV infections and Aids.

2. Poisoning: Clinical features – general management – common agents in poisoning – pharmaceutical agents – drugs of misuse – chemical pesticides – Envenomation
3. Food and Nutrition: Assessment – Nutritional and Energy requirements; Deficiency diseases –clinical features and treatment; Protein – Energy Malnutrition: Clinical features and treatment; Obesity and its related disorder: Causes – Complications – benefits of weight loss – management of Obesity – diet, exercise and medications
4. Endocrine diseases: Common presenting symptoms of endocrine disease – common classical disease presentations, clinical features and its management; Diabetes Mellitus: Etiology and pathogenesis of diabetes – clinical manifestations of the disease – management of the disease –Complications of diabetes.
5. Diseases of the blood: Examinations of blood disorders – Clinical manifestations of blood disease; Anaemia – signs and symptoms – types and management; Haemophilia - Cause – clinical features severity of disease – management – complications due to repeated haemorrhages – complications due to therapy.

## UNIT-II

1. Diseases of the digestive system: Clinical manifestations of gastrointestinal disease – Aetiology, clinical features, diagnosis, complications and treatment of the following conditions: Reflux Oesophagitis, Achalasia Cardia, Carcinoma of Oesophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of Stomach, Pancreatitis, Malabsorption Syndrome,

   Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract; Clinical manifestations of liver diseases – Aetiology, clinical features, diagnosis, complications and treatment of the following conditions: Viral Hepatitis, Wilson's Disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gall stones, Cholecystitis.

2. Cardio vascular disease: Examination of the Cardiovascular System – Investigations: ECG, Exercise Stress Testing, Radiology; Clinical manifestations of cardiovascular disease; Definition, Etiology, Clinical features, signs and symptoms, complications, management and Treatment of following diseases and disorders of the heart: Pericarditis, Myocarditis, Endocarditis, Rheumatic Fever – resulting in valve disorders, Ischemic Heart Disease, Coronary valve disease, Congenital disorders of the Heart, Cardiac Arrest; Examination and Investigations of diseases of arteries and veins; Hypertension: Definition, causes, classification, types, assessment, investigations and management.

**UNIT-III**

1. Respiratory disease: Examination of the Respiratory System – Investigations: Chest radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis; Clinical manifestations of lung disease; Patterns of lung disease – Chronic Obstructive Lung Disease and Restrictive Lung Disease; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases: Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis, Upper Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura, diaphragm and chest wall; Respiratory failure – Definition, types, causes, clinical features, diagnosis and management.

2. Diseases of the Skin: Examination and clinical manifestations of skin diseases; Causes, clinical features and management of the following skin conditions: Leprosy, Psoriasis, Pigmentary Anomalies, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections.

**UNIT-IV**

1. Pediatrics: Problems and management of LBW infants, Perinatal problems and management, congenital abnormalities and management, Respiratory conditions of childhood, Cerebral Palsy – causes, complications, clinical manifestations, treatment;

Spina Bifida – management and treatment, Epilepsies – types, diagnosis and treatment; Recognizing developmental delay, common causes of delay; Orthopedic and Neuromuscular disorders in childhood, clinical features and management; Sensory disorders – problems resulting from loss of vision and hearing; Learning and behavioural problems – Hyperactivity, Autism, Challenging behaviours, educational delay, The Clumsy Child.

2. Psychiatric Disorders: Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry.

**Recommended textbooks:**

1. Davidson's Principles and Practice of Medicine
2. Harrison's Internal Medicine
3. Braunwald Text of Cardiology
4. Text Book of Cardiology by Hurst

| Course code B23HE0506 | CARDIO-RESPIRATORY & GENERAL CONDITIONS | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of knowledge of cardiology, respiratory system.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Following the basic science and clinical science course, this course introduces the student in cardio-thoracic conditions which commonly cause disability

**Course Outcomes**

1. **CO1**- Demonstrate an understanding of respiratory system and cardiovascular system
2. **CO2**- Interpret examination findings and outline management for cardiovascular conditions.
3. **CO3** - Understand the respiratory related disease for physiotherapy importance.
4. **CO4** - Understand chest related problem and physiotherapy.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0506 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 3 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO4 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

### Respiratory disease

Define, etiology, pathogenesis, clinical features, investigation, complications, Conservative and surgical management of the following conditions

1. COPD – chronic bronchitis and Emphysema
2. Bronchial asthma
3. Suppurative disease- Bronchiectasis, Lung abscess
4. Common infectious disease-Pulmonary TB, Pneumonia
5. Interstitial lung disease
6. Occupational lung disease
7. Pulmonary vascular disease-pulmonary HT, pulmonary thromboembolism 8). Cancer lung
8. Aspergillosis
9. Cystic fibrosis
10. Disease of pleura- Pneumothorax, hydropneumothorax, pleural effusion, Empyema

### Cardiovascular disease

Define, etiology, pathogenesis, clinical features, complications, Conservative and surgical

Management of the following conditions

1. Ischemia heart disease
2. Myocardial infarction
3. Heart failure
4. Cardiac arrest
5. Rheumatic fever
6. Hypertension
7. Infective endocarditis
8. Myocarditis & cardiomyopathy

## UNIT-II

Chest wall injuries

1. Fracture rib
2. Flail chest
3. Pneumothorax
4. Haemothorax
5. Haemo pneumothorax
6. Lung contusion
7. Injury to great vessels and bronchus
8. Physiotherapy for thoracic surgeries
9. Thoracotomy
10. Lobectomy
11. Pneumonectomy
12. Decortication
13. Describe about suctioning during chest physiotherapy – Indications, types, steps, and complications.
14. Surgical conditions that require post-surgical Physiotherapy. Open heart surgery (OHS) and closed heart surgery (CHS) Thoracotomy – Median sternotomy
15. Heart lung machine
16. Angioplasty CABG
17. PTCA
18. Valve replacement
19. Valvotomy
20. Conditions requiring CHS – Mitral stenosis, Aortic stenosis, PDA, COA
21. Conditions requiring OHS-ASD,VSD, PS,TOF, TPGV, MS, MR, AS, AR Describe the principles of cardio vascular stress testing.

**UNIT-III**

**Neonatal and Pediatric Physiotherapy**

Definition, Equipment used in neonatal ICU

Chest physiotherapy for Neonates & children

Modifications of chest physiotherapy for specific neonatal disorders

Emergencies in the neonatal unit

**Physiotherapy in Obstetrics and Gynaecology**

1. Pelvic anatomy and types of Pelvis, Pelvic floor Muscles.
2. Physiology of urinary and faecal continence
3. Review of abdominal muscles and Breast.
4. Antenatal Care
5. Postnatal Care
6. Puerperium and its complication.
7. Role of Physiotherapy in Puerperium.
8. Guidelines for exercise during Pregnancy.
9. Gynaecological infections.
10. Disorders of menstruation and its PT management
11. Types of incontinence and its PT management.
12. Types of Prolapse and its PT management
13. Gynaecological surgeries and its PT management.

**UNIT-IV**

**Physiotherapy in Burns managements**

1. Classifications of Burns
2. Physiotherapy Assessment and evaluation of burns
3. Role of physiotherapy in the management of burns,
4. Post grafted cases- Mobilization and Musculo-skeletal restorative exercises and respiratory management following burns

**Exercise Prescription and Evaluation of Following Conditions**

1. Hypertension
2. Diabetes
3. Renal Failure
4. Obesity
5. Elderly
6. Women and Children

**Recommended textbooks:**

1. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
2. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
3. Elements in Pediatric Physiotherapy – Pamela M Eckersley
4. Essentials of Cardio Pulmonary Physical Therapy by Hillegass and Sadowsky
5. Cardio pulmonary Symptoms in physical Therapy practice Cohen and Michel
6. Chest Physiotherapy in Intensive Care Unit by Mac Kenzie.

| Course code B22HE0507 | PRACTICALS: FUNDAMENTALS OF YOGA | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of yoga.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the effects of yoga
2. To obtain knowledge regarding the techniques of yoga

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic principles of yoga
2. **CO2**. Able to understand the techniques of yoga

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0507 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

1. Demonstration of different yogic postures on models-
2. Supine Position - Shavasana - Halasana - Sarvangasana - Setubandhasana - Pavanmuktasana
3. Prone Position - Dhanurasana - Salabhasana - Bhujangasana - Naukasana
4. Standing - Padahastasana - Trikonasana - Utkatasana

5. Sitting - Padmasana - Siddhasana - Paschimottanasan - Yogamudrasana - Vajrasana - Gomukhasana.
6. Demonstration of different asanas on models.
7. Pranayamas – Principles, Methods and Techniques.

| Course code B23HE0508 | PRACTICAL: CARDIO RESPIRATORY PHYSIOTHERAPY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of cardiology & pulmonology.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the treatment techniques
2. To obtain knowledge regarding the techniques of cardio pulmonary physiotherapy

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic treatment techniques
2. **CO2**. Able to understand the techniques cardiopulmonary physiotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0508 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

Practicals shall be conducted for all the relevant topics discussed in theory in the following forms: Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions-

1) Physiotherapy assessment with clinical reasoning in cardiothoracic conditions.
2) Physiotherapy assessment for Obstructive and restrictive lung diseases.

3) Demonstration of physiotherapy management techniques on models-
4) Types of breathing exercises
5) Breath control techniques
6) Breathing re education
7) Relaxation positions
8) Forced expiratory technique
9) Chest mobility exercises and thoracic mobility exercises
10) Active cycle of breathing technique- ACBT
11) Manual hyper inflation
12) Huffing and coughing techniques
13) Physiotherapy in OBG
14) Physiotherapy in Neonatal conditions
15) Physiotherapy in Burns conditions

**Recommended Textbooks**


1. Tidy's physiotherapy.
2. Cash’s Text Book of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley.
6. Essentials of Cardio Pulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardio pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash’s Text book of General Medicine and Surgical conditions for Physiotherapists.
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey
12. Physiotherapy in Obstetrics and Gynecology by Polden

| Course code B22HE0509 | PRACTICAL: PHYSIOTHERAPY IN MUSCULO SKELETAL AND SPORTS-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of orthopaedics & sports.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the treatment techniques
2. To obtain knowledge regarding the techniques of orthopedic physiotherapy

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic treatment techniques
2. **CO2**. Able to understand the techniques orthopedic physiotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0509 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions of-

1. Orthopaedic assessment techniques

2. Principles of PT management in fractures
3. Selection and demonstration of physiotherapeutic techniques, manoeuvres in orthopaedic condition.
4. Bedside case presentations and case discussions-
5. Specific fractures and dislocations
6. PT assessment and management and home program for the following conditions – Osteoarthritis, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritis shoulder.
7. Osteomyelitis – acute and chronic, Septic arthritis, Pyogenic arthritis, TB spine and major joints - knee and hip.
8. PT assessment and management of the congenital and acquired deformities.
9. PT assessment and management of Cerebral palsy
10. PT assessment and management of Poliomyelitis
11. PT assessment and management of Leprosy
12. PT assessment and management of Amputations.

**Recommended textbooks:**


1. Outline of Fractures—John Crawford Adams.
2. Outline of Orthopedics.— John Crawford Adams.
3. Text book of Orthopedics.—Maheshwari.
4. Apley's Orthopedics.
5. Textbook of Orthopedics and Traumatology— M. N. Natarajan**.**

| Course code B22HE0510 | CLINICAL POSTINGS- III | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **3** | **3** |

**Course Objectives**

Upon completing the clinical postings students will be able to- demonstrate competency in observation of assessment of patients undergoing physiotherapy treatment. demonstrate competency in observation of management of patients undergoing physiotherapy treatment. These skills may be obtained in the outpatient, inpatient, and long-term care settings

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0510 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |

## VI- SEMESTER

| Course code B22HE0601 | PHARMACOLOGY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic of knowledge of pharmacology as studied in previous semester.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course introduces the student to the basic pharmacology of common drugs used, and their - importance in the overall treatment including Physiotherapy.
2. The student after completing the course will be able to understand the general principles of drug action and the handling of drugs by the body.
3. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment.

**Course Outcomes**

1. **CO1**- Interpret knowledge gained in the drugs used in the treatment of diseases affecting the various systems ofthe body
2. **CO2**- Must be able to interpret knowledge regarding the actions of drugs, and their side

### Mapping of Course Outcomes with Programme Outcomes

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0601 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

### UNIT-I

**Inflammatory/Immune Diseases**

Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Non- aspirin NSAIDs, drug Interactions with NSAIDs

Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout.

Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, Systemic Lupus Erythematosus, Scleroderma, Demyelinating Disease

**UNIT-II**

**Respiratory Pharmacology**

Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

Digestion and Metabolism

Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea.

Geriatrics Pharmacology

Pharmacology and the geriatric Population: Adverse effects of special concern in the Elderly, Dementia

Postural hypotension.

Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemics

**Recommended Textbooks**


1. Lippincott's Illustrated Reviews. Pharmacology
2. Essential of Medical Pharmacology by Tripathi.
3. Pharmacology for Physiotherapy by Padmaja Udaykumar.
4. Pharmacology & Pharmacotherapeutics by Satoskar, S.D Bhandarkar.
5. Goodman &Gilman's The Pharmacological Basis of Therapeutics

| Course code B23HE0602 | CARDIO-RESPIRATORY PHYHSIOTHERAPY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of knowledge of cardiology & respiratory system.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course serves to integrate the knowledge gained by the students in clinical cardio respiratory conditions with the skills gained in exercise therapy, electro therapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the cardio-respiratory pathology

**Course Outcomes**

1. **CO1**- identify disability due to cardio-respiratory dysfunction.
2. **CO2**- Set treatment goals and apply their skills in exercise therapy, electro therapy and massage in clinical situation to restore cardio-respiratory function.
3. **CO3** - understand the respiratory related physiotherapy in ICU.
4. **CO4** - understand for ventilator dependent patient physiotherapy and Physiotherapy for peripheral

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0602 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 |
| | CO4 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

**Physiotherapy treatment in cardio respiratory conditions-**

Define, indications, contraindication, physiological effects, types, steps, precaution, complication of the following chest physical therapy technique- Breathing exercise –DBE, Costal, Segmental, Apical Breathing control

Breathing re-education during functional activities Relaxation position for breathlessness patient Forced expiratory technique

Thoracic expansion exercise Chest mobility exercise Active cycle of breathing Positive expiratory pressure Manual hyperinflation Incentive Spirometry

Postural drainage – Modified PD, Home PD

Cough – Stages of cough, types of coughs, steps in teaching voluntary cough Factors affecting cough mechanism

Huff – Low, Mid, High lung volume huff Vibrations, Percussion, Shaking

Ventilator – Modes, types, principles, weaning

Humidification – Physiology, Bubble jet, Pass over, Ultrasonic nebulizer Humidifier

Nebulization – Physiology, MDI, Ultrasonic,

Suctioning – Oropharyngeal, Nasopharyngeal, intubated, steps, complications

## UNIT-II

**Pulmonary Rehabilitation**

Define, indication, outcomes, steps in pulmonary rehabilitation, contraindication Education

**Cardiac Rehabilitation**

Define, Indication, Phases of cardiac rehabilitation, contraindication, benefits, Education

**Physiotherapy in general surgery**

Pre-operative and Post-operative management for patient with abdominal surgery

Conditions – appendicectomy, mastectomy, gastrectomy, hysterectomy, herniorrhaphy, cholecystectomy, colostomy

## UNIT-III

**Physiotherapy in Intensive Care Unit**

Define, Indications, Types of ICU, Equipment used in adult and pediatric ICU, Assessment, Principles of physiotherapy for a patient in ICU including chest Physiotherapy and adjacent for adult and pediatric patient.

**Physiotherapy for ventilator dependent patient**

Definition of ventilator, Types of ventilators, Principles of Ventilator, Indications of ventilator, PT assessment of ventilator dependent patient, PT management

## UNIT-IV

**Physiotherapy in abdominal surgery and Radiation oncology**

Different Incision in abdominal region

Immediate and late complications of abdominal surgery

Physiotherapy management for abdominal surgery

TNM Classification of cancer

Complications of radiation therapy

Physiotherapy management for pre and post-operative cancer

**Physiotherapy for peripheral vascular diseases**

Definition, Physiology, Conditions of PVD, evaluation-arterial, venous, lymphatic, Doppler, Treatment- Buerger's exercise, cold laser, electrical stimulation,

Intermittent compression.

**Recommended Textbooks:**

1. Tidy's physiotherapy.
2. Cash’s Text Book of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley
6. Essentials of Cardio Pulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardio pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash’s Text book of General Medicine and Surgical conditions for Physiotherapists.
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey
12. Physiotherapy in Obstetrics and Gynecology by Polden

| Course code B22HE0603 | PHYSIOTHERAPY MUSCULO SKELETAL & SPORTS-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic knowledge of physiotherapy as studied in previous semester.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course serves to integrate the knowledge gained by the students in clinical Musculo skeletal and sports conditions, with the skills gained in exercise therapy, electro therapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the Musculo skeletal and sports pathology.

**Course Outcomes**

1. **CO1**- Identify disability due to cardio-respiratory dysfunction.
2. **CO2**- Set treatment goals and apply their skills in exercise therapy, electro therapy and massage in clinical situation to restore cardio-respiratory function.
3. **CO3** - Understand the knee, ankle architecture and related problem.
4. **CO4** - Understand for sport physiotherapy and yoga.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0603 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 2 |
| | CO4 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

1. Spinal conditions: Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro- iliac joint dysfunction, Sacralization, Lumbarization, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.
2. Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction.
3. Osteoporosis- causes, predisposing factors, investigations and treatment.
4. Orthopaedic surgeries: Pre and post- operative PT assessment, goals, precautions and PT management of following surgeries such as: Arthrodesis, Osteotomy, Arthroplasty- partial and total - Excision arthroplasty, excision arthroplasty with implant, inter positional arthroplasty and total replacement; Tendon transplant, soft tissue release- tenotomy, myotomy, lengthening; arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.

## UNIT-II

5. Shoulder joint: Shoulder instabilities, TOS, RSD, Impingement syndrome – conservative and Post- operative PT management. Total shoulder replacement and Hemi replacement. - Post- operative PT management. AC joint injuries - rehabilitation. Rotator cuff tears conservative and surgical repair. Subacromial decompression Post-operative PT management.
6. Elbow and forearm: Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative PT management.
7. Wrist and Hand: Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations - Post operative PT management.
8. Hip: Joint surgeries - hemi and total hip replacement - Post operative PT management tendonitis and bursitis management.

## UNIT-III

9. Knee: Lateral retinacular release, chondroplasty- Post operative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation. Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome- conservative management. TKR- rehabilitation protocol. Patellar tendon ruptures and Patellectomy- rehabilitation.
10. Ankle and foot: Ankle instability. Ligamentous tears- Post operative management.
11. Introduction to Bio-Engineering; Classification of Orthoses and prostheses; Biomechanical principles of orthotic and prosthetic application; Designing of upper extremity, lower extremity and spinal orthosis, indications and check out; Designing of upper extremity and lower extremity prostheses, indications and check out; psychological aspects of orthotic and prosthetic application; prescription and designing of footwear and modifications; Designing and construction of adaptive devises.

**UNIT-IV**

12. Sports Physiotherapy: Physical fitness. Stages of soft tissue healing. Treatment guidelines for soft tissue injuries- Acute, Sub acute and chronic stages. Repair of soft tissues- rupture of muscle, tendon and Ligamentous tears. Soft tissue injuries- prevention and rehabilitation of, Lateral ligament sprain of ankle. Rotator cuff injuries. Collateral and Cruciate injuries of knee. Meniscal injuries of knee. Supraspinatus and Bicipital tendonitis. Pre-patellar and Subacromial bursitis. Tennis and Golfer's elbow. Hamstring strains, Quadriceps contusion, TA rupture. De Quervan’s tenosynovitis. Trigger and Mallet finger. Plantar fasciitis. Wrist sprains.
13. Applied Yoga in orthopaedic conditions

**Recommended Textbooks:**


1. Tidy's physiotherapy.
2. Textbook of orthopedics- Cash.
3. Clinical orthopedic rehabilitation- Brotzman.
4. Orthopedic physiotherapy - Jayant Joshi.
5. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz
6. Sports physiotherapy- Maria Zuluaga

| Course code B22HE0604 | GENERAL SURGERY | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic knowledge of anatomy, physiology & fluid.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This subject follows the basic science subjects to provide the knowledge about relevant aspects of general surgery.
2. The student will have a general understanding of the surgical conditions the therapist would encounter in their practice

**Course Outcomes**

1. **CO1**- List the indications for surgery, etiology and clinical features for different medical conditions.
2. **CO2**- Interpret knowledge gained in the study of different conditions and diseases, with the surgical procedures for those conditions.
3. **CO3** - Understand the disease of arteries, veins, burn and treatment for physiotherapy.
4. **CO4** - Understand for women's health, MC, labor pain and ENT related problem.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0604 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 1 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 1 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| | CO4 | 2 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 3 |

**Course Contents: 48 Hours**

## UNIT-I

1. Fluid, Electrolyte and Acid-Base disturbances – diagnosis and management; Nutrition in the surgical patient; Wound healing – basic process involved in wound repair, basic phases in the healing process, clinical management of wounds, factors affecting wound healing, Scars – types and treatment. Haemostasis – components, haemostatic disorders, factors affecting bleeding during surgery. Transfusion therapy in surgery – blood components, complications of transfusion; Surgical Infections; General Post – Operative Complications and its management.
2. Reasons for Surgery; Types of anaesthesia and its effects on the patient; Types of Incisions; Clips Ligatures and Sutures; General Thoracic Procedures – Radiologic Diagnostic procedures, Endoscopy – types, Biopsy – uses and types. Overview and Drainage systems and tubes used in Surgery
3. Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations – Airway obstruction, Pneumothorax, Haemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Oesophageal disruption, Cardiac and Pulmonary Contusions.
4. Surgical Oncology – Cancer – definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer.

## UNIT-II

5. Disorders of the Chest Wall, Lung and Mediastinum – Definition, Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, chest wall tumours, Spontaneous Pneumothorax, pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis, Tuberculosis, Bronchogenic Carcinoma, Bronchial Adenomas, Metastatic tumours of the Lung, tracheal Stenosis, Congenital tracheomalacia, Neoplasms of the trachea, Lesions of the Mediastinum. Carcinoma of the female breast.
6. Disorders of the ear– Definition, Clinical features, diagnosis and choice of management for the following disorders: congenital heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease: Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot,

Transposition of Great Vessels; Acquired Heart Disease – Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumours.

7. Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications. Lung surgeries: Pneumonectomy, Lobectomy, segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung. Cardiac surgeries – An overview of the Cardio-Pulmonary Bypass Machine – Extracardiac Operations, Closed Heart surgery, Open Heart surgery. Transplant Surgery – Heart, Lung and Kidney – Indications, Physiological changes and Complications.

**UNIT-III**

8. Diseases of the Arteries and Veins: Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases: Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.
9. Definition, Indication, Incision, Physiological changes and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendicectomy Mastectomy, Nephrectomy, Prostectomy.
10. Burn: Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management. Skin Grafts – Types, Grafting Procedures, Survival of Skin Graft; Flaps – Types and uses of Flaps.

**UNIT-IV**

11. Women's' Health: Menstrual cycle and its disorders. Hormonal disorders of females-obesity and female hormones. Cancer of the female reproductive organs- management of Infections and sexually transmitted disease in female Menopause - its effects on emotions and musculoskeletal system. Malnutrition and deficiencies in females. Sterility-patho physiology investigations-management. Maternal physiology in pregnancy. Musculo skeletal disorders during pregnancy. Prenatal complications-investigations- management. Child birth- Stages - complications-investigations-management – Pain relief in labour - Puerperium - Post Natal care. Surgical procedures involving child birth. Incontinence – Types, Causes, Assessment and Management. Definition, Indications and Management of the following surgical procedures –

Hystero-salphyngography, Dilatation and Curettage, Laparoscopy, Colposcopy, Hysterectomy.

12. ENT: Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy.
13. Ophthalmology: Ophthalmologic surgical conditions, refraction's, conjunctivitis, glaucoma, corneal ulcer, iritis, cataract, retinitis, detachment of retina, defects of extra-ocular muscles surgical management

**Recommended Textbooks:**

1. General Surgical Operations – by Kirk / Williamson
2. Surgery by Nan
3. Bailey and Love's – Short Practice of Surgery
4. Chest Disease by Crofton and Douglas.
5. Patrica A Downie, Text book of Heart, Chest Vascular Disease for physiotherapists, J P Brothers.

| Course code B22HE0605 | BIOSTATISTICS & RESEARCH | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Basic of mathematics & research.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course will introduce to the student the basic research methodology, statistical concepts, methods of statistical analysis: and interpretation of data.

**Course Outcomes**

1. **CO1**- Interpret the knowledge gained on the basic concepts of principles of biostatistics to be used in researchstudies.
2. **CO2**- Interpret knowledge gained in the study of principles and methods of research methodology in researchstudies.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0605 | CO1 | 2 | 3 | 3 | 3 | 1 | 2 | 3 | 1 | 3 | 1 | 1 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

## BIOSTATITICS

1. Introduction: Meaning, definition, characteristics of statistics., Importance of the study of statistics, branches of statistics, Statistics and health science including

physiotherapy, Parameters and estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.

2. Tabulation of Data: Basic principles of graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.
3. Measure of Central Tendency: Need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped., Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency.
4. Probability and Standard Distributions: Meaning of probability of standard distribution, The binominal distribution, The normal distribution, Divergence from normality – skew ness, kurtosis.
5. Sampling techniques: Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors, Sampling variation and tests of significance.
6. Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA).

## UNIT-II

## RESEARCH METHODODLOGY

1. Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, Problems encountered by researchers in India.
2. Research problem: Statement of research problem., Statement of purpose and objectives of research problem, necessity of defining the problem.
3. Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design.
4. Sampling Design: Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design.

5. Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification., Important scaling techniques.
6. Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.
7. Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions.
8. Processing & analysis of data: Processing operations, problems in processing, Types of analysis, Statistics in research, Measures of central tendency, Dispersion, Asymmetry, relationship.
9. Testing of hypothesis: What is hypothesis? Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, limitations of the tests of hypothesis.
10. Computer technology: Introduction to Computers, computer application in research, computers & researcher.

**Recommended Textbooks:**


1. Elements of Health Statistics: Rao.N.S. N
2. An introduction of Biostatistics: Sunder Rao.P.S.S.
3. Methods in Bio-Statistics 6th Edn. 1997: B.K. Mahajan
4. Biostatistics: A manual of Statistics Methods: K. Visweswara Rao
5. Elementary Statistics 1st Edn, 1990. in Medical Workers: Inderbir Singh
6. Statistics in Psychology and education: Great and Henry
7. An Introduction to Gupta C.B. Statistical Methods, 1972: Ram Prasad & Sons
8. Basic Statistics, 3rd Edn.: Simpsory G. Kaftha. P
9. Research; Principles and Methods: L Denise F. Poli & Hungler
10. Fundamentals of Research, 4th Edn.: David J. fox

| Course code B23HE0606 | ETHICS, ADMINISTRATION & EDUCATION | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **1** | **1** | **0** | **2** |

**Pre-requisites**

Basic about the moral, ethic, sociology & rule-regulation.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course will introduce to the student the basic concepts of ethics, administration and supervision to be followed in research studies and clinical practice.

**Course Outcomes**

1. **CO1**- Interpret the knowledge gained on the basic concepts of ethics, with particular emphasis on health care.
2. **CO2**- Interpret knowledge gained in the study of principles and methods of administration and supervision in patient care.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0606 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**UNIT-I**

1. History of physiotherapy, Ethical principles in health care, Ethical principles related to physiotherapy, Scope of practice, Enforcing standards in health profession-promoting quality care. Professional ethics in research, education and patient care delivery,

Informed consent issues, medical ethics. Major ethical principles applied to moral issues in health care and Economics in clinical decision-making.

2. Rules of professional conduct and scope of practice. Physiotherapy as a profession
3. Relationship with patients, with health care institutions, with colleagues and peers, with medical and other professional.
4. Confidentiality and Responsibility, Malpractice and negligence, Provision of services and, advertising, Legal aspects: Consumer protection act, Legal responsibility of physiotherapist for their action in professional context and understanding liability and obligations in case of medico-legal action.
5. Professional and government licensing accreditation and education standards.
6. Laws and legal concepts
7. 6.Outline legal aspects related to rehabilitation, Medico legal cases, Workman compensation, Insurance facilities other financial benefits available for the disability.
8. Law protection from malpractice claim, Consumer protection act. Liability &documentation
9. Constitution and functions of the Indian association of Physiotherapists.
10. Functioning of the World Confederation of Physical therapy (W.C.P.T and its various branches special interest groups (brief)
11. Role of WHO and WCPT.
12. Outline safety precautions in Physiotherapy.
13. IAP - Memorandum of Association & Rules and Regulations.

## UNIT- II

### ADMINISTRATION AND SUPERVISION

1. Introduction: Branches of administration, Nature and scope of administration, how to be an effective administrator, Planning hospital administration as part of a balanced health care program.
2. Principles of hospital administration and its applications to physiotherapy.
3. Planning and organization: Planning cycle, Principles of organizational charts, Resource and quality management, Planning change -innovation
4. Financial issues including budget and income generation
5. Hospital administration: Organization, Staffing, Information, Communication, Coordination, cost of services, Monitoring and evaluation.

6. National health policy and health care system in India
7. Organization of physiotherapy department: Planning, Space, Manpower, Other basic resources.
8. Organizing meetings, committees, and negotiations
9. Material management Pharmacy, Hospital waste disposal
10. Quality assurance hospital acquired infection, Quality assurance through record review and medical audit.
11. Public relations in hospital and human resource management.

**Recommended Textbooks**:


1. Medical Ethics by C M Francis.
2. George V Lobo – Current Problems in Medical Ethics
3. Consumer Protection Act – 1986, Government of India, New Delhi.
4. Francis C M – Hospital Administration
5. Davies, R and Macaulay, BMC – Hospital Planning and Administration
6. Health Services Management, Analysis & Application, Wadsworth Publishing Company, Belmont.
7. Essentials of community physiotherapy & ethics 2015 By Prof. (dr.) Rajendra Rajput

| Course code B23HE0607 | PRACTICAL: CARDIO RESPIRATORY PHYSIOTHERAPY - II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of cardiology & pulmonary.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the treatment techniques
2. To obtain knowledge regarding the techniques of cardio-pulmonary physiotherapy

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic treatment techniques
2. **CO2**. Able to understand the techniques cardio-pulmonary physiotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B23HE0607 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

Shall be conducted for all the relevant topics discussed in theory in the following forms:
Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions-
Assessment and management of cases/ conditions bedside for-

1. Pre and postoperative physiotherapy management for Pneumonectomy, Lobectomy and Segmentectomy.

2. Physiotherapy assessment and management in cardiac conditions- coronary artery diseases- IHD, MI, Heart failure, Hypertension, CABG, PTCA.
3. Pre and post operative management of cardiac surgeries.
4. Principles and indications of ventilators; principles and methods of weaning from ventilators.
5. Humidification
6. Nebulization
7. Suctioning
8. Pulmonary rehabilitation
9. Cardiac rehabilitation
10. Physiotherapy after general surgery
11. Physiotherapy in ICU
12. Physiotherapy on ventilated patients
13. Physiotherapy in Peripheral Vascular diseases
14. Physiotherapy in Pre and Post-operative Abdominal surgery and Cancer patients
15. Physiotherapy in Peripheral Vascular diseases

**Recommended Textbooks:**


1. Tidy's physiotherapy.
2. Cash’s Text Book of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley
6. Essentials of Cardio Pulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardio pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash’s Text book of General Medicine and Surgical conditions for Physiotherapists.
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey
12. Physiotherapy in Obstetrics and Gynecology by Polden

| Course code B22HE0608 | PRACTICAL: PHYSIOTHERAPY IN MUSCULO SKELETAL AND SPORTS -II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of skeletal system & sports.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the treatment techniques
2. To obtain knowledge regarding the techniques of musculoskeletal physiotherapy

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic treatment techniques
2. **CO2**. Able to understand the techniques musculoskeletal physiotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0608 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.
2. Bedside case presentations and case discussions of following conditions- Spondylosis, Intervertebral disc prolapse, Spondylolisthesis, Sacralization, Lumbarization.

Arthrodesis, Osteotomy, Arthroplasty, Joint replacement- hip, knee and soft tissue re-construction surgeries
Reconstructive and ligament surgeries of shoulder, elbow and wrist, hip, knee and ankle foot. Designing and construction of adaptive devices in patients.
Exposure to sports injuries.

**Recommended Textbooks:**


1. Tidy's physiotherapy.
2. Textbook of orthopedics- Cash.
3. Clinical orthopedic rehabilitation- Brotzman.
4. Orthopedic physiotherapy - Jayant Joshi.
5. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
6. Sports physiotherapy- Maria Zuluaga

| Course code B22HE0609 | PRACTICAL: PHYSICAL EDUCATION | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of exercise & sports.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the physical training
2. To obtain knowledge regarding the techniques of physical activity training.

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic treatment techniques
2. **CO2**. Able to understand the techniques musculoskeletal physiotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0609 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

1. Preparation of first aid kit for sports injuries
2. First aid for road, water, fire accidents and athletic injuries
3. Treatment of heat stroke
4. Preventive measures for health hazards
5. Introduction to outdoor and indoor games.
6. Preparing a report of the achievements of eminent players.
7. Strategies for positive thinking and motivation

8. Demonstration of aerobic and anaerobic exercises, with effects on circulatory, muscular, digestive and respiratory systems
9. Fitness components and its importance.

**Recommended Textbooks:**


1. Agarwal, Satya, P. (1998), The social role of the Gita: How and why, Motilal Banarsidass,
2. Goel Devraj & Goel Chhaya (2013) Universe of Swami Vivekananda & Complete Wholistic
3. Social Development, CASE Publication under UGC SAP, The M.S University of Baroda, Vadodara.
4. Porter, Noah. (2003) Falung Gong in the United States: An Ethnographic Study, Master Thesis, Department

| Course code B22HE0610 | CLINICAL POSTINGS- IV | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **3** | **3** |

**Course Objectives**

Upon completing the clinical postings students will be able to- demonstrate competency in observation of assessment of patients undergoing physiotherapy treatment. demonstrate competency in observation of management of patients undergoing physiotherapy treatment. These skills may be obtained in the outpatient, inpatient, and long-term care settings

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0610 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |

## VII - SEMESTER

| Course code<br>B22HE0701 | PHYSIOTHERAPY IN NEUROLOGY & PAEDIATRICS-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:**<br>3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of physiotherapy, neurology & paediatrics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course serves to integrate the knowledge gained by the students in clinical neurology with the skills gained
2. In exercise therapy, electro therapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the nervous system.

**Course Outcomes**

1. **CO1**- identify disability due to neurological dysfunction.
2. **CO2**- Set treatment goals and apply their skills in exercise therapy, electro therapy and massage in clinical situation to restore neurological function.
3. **CO3** - understand the disease paediatric neurology and their examination.
4. **CO4** - understand for evaluation and management of brain and spinal cord disorders.

### Mapping of Course Outcomes with Programme Outcomes

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0701 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 3 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 |
| | CO4 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

**Neurological Assessment**: Required materials for examination, Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function – Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning, and Judgment, Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity, Reflexes – Developmental reflexes, deep tendon reflexes, Superficial reflexes, Sensory examination – Superficial, Deep and Cortical sensations, Special tests – Romberg's, Kernig's sign, Brudenzki sign, Tinel's sign, Slum test, Lhermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc., Balance examination, coordination examination, Gait analysis – Kinetics & Kinematics (Quantitative & Qualitative analysis), Functional Analysis, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading. Differential diagnosis.

## UNIT-II

**Neuro physiological Techniques** – Concepts, Principles, Techniques, Effects of following Neurophysiological techniques: NDT, PNF, Vojta therapy, Rood's Sensory motor Approach, Sensory Integration Approach, Brunnstrom movement therapy, Motor relearning program, Contemporary task-oriented approach, Muscle re-education approach and Constraint induced movement therapy.

## UNIT-III

**Paediatric Neurology**: Paediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation & Management History, Observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications,

Use of various neurophysiological approaches & Modalities in Risk babies, Minimum brain damage, Developmental disorders, Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus, Chorea, Spina bifida, and syringomyelia.

## UNIT-IV

**Evaluation and Management of Brain and Spinal Cord Disorders**: History, Observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & long term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Cerebro vascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumours, Perceptual disorders, Amyotrophic lateral sclerosis, and Multiple sclerosis.

**Recommended Textbooks:**


1. Tidy's physiotherapy.
2. Cash's Textbook of Neurology for Physiotherapists.
3. Neurological Rehabilitation by D Umphred.
4. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz.
5. Elements of Pediatric Physiotherapy-Eckersley.

| Course code B22HE0702 | COMMUNITY PHYSIOTHERAPY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 4 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of physiotherapy in different condition of disease and problem for body function.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course serves to integrate the knowledge gained by the students in community medicine and other areas
2. To apply these in clinical situations of health and disease and its prevention.

**Course Outcomes**

1. **CO1**- Identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions.
2. **CO2**- Plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.
3. **CO3** - Understand the disability, different types and prevention.
4. **CO4** - Understand for evaluation of disability and related data.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0702 | CO1 | 2 | 1 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 1 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| | CO3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 1 |
| | CO4 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 1 | 3 | 3 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

Rehabilitation: Definition, Types.

Community: Definition of Community, Multiplicity of Communities, The Community based approach, Community Entry strategies, CBR and Community development, Community initiated versus community-oriented programme, Community participation and mobilization.

Introduction to Community Based Rehabilitation: Definition, Historical review, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR, Members of CBR team, Models of CBR

## UNIT-II

Principles of Community based Rehabilitation. W.H.O.`s policies-about rural health care concept of primary/tertiary health centers-district hospitals etc.

Role of P.T.-Principles of a team work of medical person/P.T./O.T. audiologist/speech therapist/ P.&O./vocational guide in C.B.R. of physically handicapped person.

Agencies involved in rehabilitation of physical handicapped - Legislation for physically handicapped. Concept of multipurpose health worker. Role of family members in the rehabilitation of a physically handicapped.

Planning and management of CBR Programmes, CBR Programmed planning and management, Ownership and governance, Decentralization and CBR, Management of CBR, programmed sustainability, Communication and coordination, Community participation, mobilization and awareness, CBR programme influence on promoting and developing public policies.

## UNIT-III

Disability: Definition of Impairment, Handicap and Disability, Difference between impairment, handicap and disability, Causes of disability, Types of disability, Prevention of disability,

Disability in developed countries, Disability in developing countries. Disability Surveys: Demography. Screening: Early detection of disabilities and developmental disorders, Prevention of disabilities- Types and levels

## UNIT-IV

Disability Evaluation: Introduction, what, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings

Role of Government in CBR: Laws, Policies, Programmes, Human Rights Policy, Present rehabilitation services, Legal aspects of rehabilitation

**Recommended Textbooks:**

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De Lisa.

| Course code B22HE0703 | COMMUNITY MEDICINE | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic knowledge of community related problem and history of disease.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. The course will enable students to understand the effects of the environment and the community dynamics on the health of the individual

**Course Outcomes**

1. **CO1**- interpret knowledge gained in the study of health and diseases affecting the community, measures to prevent diseases and disability.
2. **CO2**- demonstrate an understanding of the influence of social and environmental factors of health of individual and society.
3. **CO3** - understand the disease outline and the influence of nutritional factors.
4. **CO4** - understand for principles of health education, methods of communication.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0703 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 2 | 2 | 1 | 2 |
| | CO4 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 2 | 3 |

**Course Contents: 48 Hours**

## UNIT-I

1. Outline the natural history of diseases and the influence of social, economic and cultural aspects of health and diseases
2. Outline the various measures of prevention and methods of intervention especially for diseases with disability.
3. Outline the natural care delivery system and the public health administration system at central and state government level- primary health care, school health, health team at district hospitals and PHC, voluntary and international agencies in health care.
4. Outline selective national health schemes.
5. Define occupational health and list methods of prevention of occupational hazards

## UNIT- II

1. Outline the Employees State Insurance scheme and its benefit.
2. Describe the social security measures for protection from occupational hazards, Accidents, diseases and workman compensation act.
3. Define community-based rehabilitation, institution-based rehabilitation. Describe the advantages and disadvantages of institution based and community-based Rehabilitation.
4. Describe the following communicable diseases with reference to water reservoir, Mode of transmission, route of entry and levels of prevention
   a. Poliomyelitis
   b. Meningitis
   c. Encephalitis
   d. Tuberculosis
   e. Filariasis
   f. Leprosy
   g. Tetanus
   h. Measles.

## UNIT- III

1. Describe the epidemiology of Rheumatic heart disease, cancer, chronic degenerative
2. Outline the influence of nutritional factors such as protein energy malnutrition, Anaemia, vitamin deficiency and minerals on disability, nutritional programmes, balanced diet, nutritional requirement and source, food adulteration.

**UNIT- IV**

1. List the principles of health education, methods of communication and role of health education in rehabilitation service-AV aids, planning a health education programme.
2. Define the role of community leaders and health professional in health education.
3. Outline the role of international health agencies in rehabilitation of the disabled.

**Recommended Textbooks:**

1. Textbook of Preventive & Social Medicine, Dr. J E Park

| Course code B22HE0704 | CLINICAL NEUROLOGY & PAEDIATRICS | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Neuro science, physiology related disorder and child related problem.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. Following the basic science and clinical science course, this course introduces the student to the neurological conditions which commonly cause disability

**Course Outcomes**

1. **CO1**- Demonstrate knowledge gained in the study of neurological conditions causing disability and their management.
2. **CO2**- Demonstrate knowledge gained in the study of paediatric conditions causing disability and their management
3. **CO3** - Understand the different type of infection related to spinal cord and neurological disorder.
4. **CO4** - Understand for growth and development of a child from birth to 12 years and their development

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0704 | CO1 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |
| | CO3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| | CO4 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |

**Course Contents: 48 Hours**

## UNIT-I

### NEURO ANATOMY

1. Basic anatomy of brain and spinal cord
2. Blood supply of brain and spinal cord
3. Anatomy of the visual pathway
4. Connections of the cerebellum and extra pyramidal system
5. Relationship of spinal nerve to the spinal cord segments
6. Tract of the spinal cord
7. Brachial, lumbar and sacral plexuses
8. Cranial nerves.
9. Neurophysiologic basis of tone, disorder of tone, posture, bladder control, muscle contraction, movement, and pain.

### ASSESSMENT

1. Basic history taking to determine whether the brain, spinal cord, peripheral nerve is involved
2. Assessment of higher mental function – orientation, memory, attention, speech, language
3. Assessment of cranial nerves 4 Assessment of motor power
4. Assessment of sensory function – touch, pain, temperature, position
5. Assessment of tone – spasticity, rigidity, and hypotonia.
6. Assessment of cerebellar function
7. Assessment of higher cortical function – apraxia
8. Assessment of gait abnormalities

## UNIT-II

### CLINICAL FEATURES AND MANAGEMENT

1. Congenital childhood disorders
   Cerebral palsy Hydrocephalus Spina bifida
2. Cerebrovascular accidents

Definition, etiology, classification – thrombotic, embolic, hemorrhagic Clinical findings, management.

3. Trauma
   Head injury Spinal cord injury
4. Diseases of the spinal cord Cranio cerebral junction anomalies Syringomyelia
   Cervical and lumbar disc lesions Tumors
   Spinal arachnoiditis
5. Demyelinating diseases
   Guillain – barre syndrome
   Acute disseminated encephalomyelitis Transverse myelitis
   Multiple sclerosis
6. Degenerative disorders Parkinson disease Dementia

**UNIT-III**

1. Infections
   Pyogenic meningitis sequelae Tuberculous infection of CNS Poliomyelitis
   Tabes dorsalis HIV infection Encephalitis
2. Disease of the muscle
   Myopathies Muscular dystrophy
   Spinal muscular atrophy
3. Peripheral nerve disorders Peripheral nerve injuries Entrapment neuropathies Peripheral neuropathies
4. Spinal cord lesions Paraplegia Quadriplegia Neurogenic bladder
5. Miscellaneous Disorders of ANS Epilepsy Myasthenia gravis Intracranial tumours Motor neuron disease, Alzheimer disease

**UNIT-IV**

**PAEDIATRICS**

Describe growth and development of a child from birth to 12 years – physical, social, adaptive development.

1. Common infectious diseases in children- Brief description of following infectious diseases along with outline of management- Tetanus, diphtheria, Mycobacterial, measles, chicken pox, gastroenteritis, HIV, and Malaria.
   Lung infections – Bronchiectasis, lung abscess, bronchial asthma

2. High risk pregnancy – maternal factors and neonatal factors contributing to HRP – Gestational diabetes, Pregnancy induced HT, Bleeding in mother, Chronic maternal diseases such as heart disease, renal failure, TB, Epilepsy
3. Immunization programmes- WHO schedule, different vaccinations, rationale; special consideration to various disease eradication programmes like Pulse.
4. Cerebral palsy – Define, etiology, types, clinical findings, examination, management Briefly outline associated defects – MR, microcephaly, blindness Hearing and speech impairment, squint, convulsion.
5. Poliomyelitis, Muscular dystrophy – Define, various forms, clinical manifestation, disabilities, management
6. Spina bifida, meningomyelocele– outline development, clinical features, hydrocephalus and Medical and surgical management.
7. Still disease – classification, pathology, clinical findings, treatment
8. Normal diet of new born and child – dietary calorie, requirement for normal child, Malnutrition, rickets, vitamin D deficiency, and mineral deficiencies (iron, calcium, phosphorus, iodine) in children & management in brief.
9. Acute CNS infections- Clinical presentation, complications and management of bacterial and tubercular infections in brief.
10. Clinical presentation, management & prevention of the following cardiac conditions: Rheumatic heart disease, SABE, Congenital heart disease – ASD, VSD, PDA.

**Recommended Textbooks:**

1. Davidson's Principles and Practice of Medicine
2. Textbook of Neurology- Victor Adams
3. Brains Clinical Neurology.
4. Illustrated Neurology & Neurosurgery.
5. Brains Diseases of Nervous System

| Course code B22HE0706 | EVIDENCE BASED PRACTICE | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 2 hrs./week | | **2** | **0** | **0** | **2** |

**Pre-requisites**

Knowledge about the case study related problem and application of physiotherapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. The course will enable students to understand the principles and concepts of evidence-based practice in Physiotherapy.

**Course Outcomes**

1. **CO1**- Interpret knowledge gained in the study of evidence-based research studies with respect to clinical physiotherapy practice.
2. **CO2**- Interpret knowledge gained in the research work in physiotherapy

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0706 | CO1 | 1 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 |

**Course Contents: 26 Hours**

**UNIT-I**

1. Introduction to Evidence Based Practice: Definitions, Evidence Based Practice, Evidence Based Physiotherapy Practice.
2. Concepts of Evidence based Physiotherapy: Awareness, Consultation, Judgement, Creativity.
3. Development of Evidence based knowledge, The Individual Professional, Professionals within a discipline, professionals across disciplines.

4. Evidence Based Practitioner: The Reflective Practitioner, The E Model, Using the E Model.
5. Finding the Evidence: Measuring outcomes in Evidence Based Practice, Measuring Health outcomes, measuring clinical outcomes, Inferential statistics and Causation.
6. Searching for the Evidence: Asking Questions, Identifying different sources of evidence, electronic bibliographic databases and World Wide Web, Conducting a literature search. Step by-step search for evidence.
7. Assessing the Evidence: Evaluating the evidence; Levels of evidence in research using quantitative methods. 8.Levels of evidence classification system, Outcome Measurements, Biostatistics, the critical review of research using qualitative methods.

**UNIT- II**

1. Systematically reviewing the evidence: Stages of systematic reviews, Meta-analysis, The Cochrane c collaboration
2. Economic evaluation of the evidence: Types of economic evaluation, conducting economic evaluation, critically reviewing economic evaluation, Locating economic evaluation in the literature.
3. Using the evidence: Building evidence in practice; Critically Appraised Topics (CATs), CAT format, Using CATs, Drawbacks of CATs.
4. Practice guidelines, algorithms, and clinical pathways: Recent trends in health care, Clinical Practice Guidelines (CPG), Algorithms, Clinical pathways, Legal implications in clinical pathways and CPG, Comparison of CPGs, Algorithms and Clinical Pathways.
5. Communicating evidence to clients, managers and funders: Effectively communicating evidence, Evidence based communication in the face of uncertainty, Evidence based communication opportunities in everyday practice.
6. Research dissemination and transfer of knowledge: Models of research transfer, Concrete research transfer strategies, Evidence based policy.

**Recommended Textbooks:**


1. Evidence-Based Practice in Nursing and Health Care: A Guide to Best Practice, by Bernadette Melnyk (Editor), Ellen Fineout-Overholt (Editor)
2. Evidence-Based Rehabilitation: A Guide to Practice, by Mary Law
3. Achieving Evidence-Based Practice, by Susan Hamer, BA, MA, RGN, FETC(DIST),
4. The Evidence-Based Practice by Stout, Randy A Hayes.

| Course code B22HE0707 | PRACTICAL: PHYSIOTHERAPY IN NEUROLOGY & PAEDIATRICS-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of neurology & paediatrics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the techniques of neuro and paediatric rehabilitation
2. To obtain knowledge regarding the techniques of neuro and pediatric rehabilitation.

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic treatment techniques
2. **CO2**. Able to understand the techniques of neuro and pediatric rehabilitation

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0707 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

Shall be conducted for all the relevant topics discussed in theory in the following forms:

Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions of-

1. Neurological assessment techniques.
2. Neurological treatment techniques.

3. Neurophysiological approaches & Modalities in Risk babies, Minimum brain damage and developmental disorders.

Bedside case presentations and case discussions of following important cases/ conditions-

1. Evaluation and Management of Brain and Spinal Cord Disorders
2. Evaluation and Management of Cerebellar, Spinal Cord and Muscle Disorders
3. Evaluation and Management of Peripheral Nerve Injuries and Disorders
4. Assessment and management of Neurological gaits
5. Pre and Post surgical assessment and treatment following conditions- disc herniation, spinal stenosis, head trauma, brain and spinal tumors, epilepsy
6. Parkinson's disease, Psychiatric disorders, spina bifida.

**Recommended Textbooks:**

1. Tidy's physiotherapy.
2. Cash's Textbook of Neurology for Physiotherapists.
3. Neurological Rehabilitation by D Umphred.
4. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz.
5. Elements of Pediatric Physiotherapy-Eckersley.

| Course code B22HE0708 | PRACTICAL: COMMUNITY PHYSIOTHERAPY-I | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of community physiotherapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the patient related problems in community.
2. To obtain knowledge regarding the challenges faced by patients in the community.

**Course Outcomes**

1. **CO1**. Ready to demonstrate the basic patient related problems in community
2. **CO2**. Able to understand the regarding the challenges faced by patients in the community.

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0708 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

This will consist of Field visits to urban and rural PHC's.

1. Visits to regional rehabilitation training center
2. Regular mobile camps
3. Disability surveys in villages
4. Disability screening.

**Recommended Textbooks:**

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De Lisa

| Course code B22HE0709 | CLINICAL POSTINGS- V | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **3** | **3** |

**Course Objectives**

Students will be posted in rotation in the following areas/wards.

The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision.

Evidence based practice will be part of training.

1. Physiotherapy OPD
2. Neurology, Neurosurgery & Neuro ICU
3. Community-PHC
4. Orthopaedics
5. General Medicine & MICU

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0709 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |

## VIII - SEMESTER

| Course code B22HE0801 | PHYSIOTHERAPY IN NEUROLOGY & PAEDIATRICS-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of physiotherapy, neurology and paediatrics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. The course will enable students to understand the principles and concepts of role of physiotherapy in management of neurological conditions.

**Course Outcomes**

1. **CO1**- Interpret knowledge gained in the study of clinical features, diagnosis and investigations in neurological diseases.
2. **CO2**- Interpret knowledge gained in the study of physiotherapy management of neurological and paediatric conditions.
3. **CO3** - Understand the cerebellar, spinal cord and muscle disorders, evaluation and management of peripheral nerve injuries and disorders.
4. **CO4** - Understand for assessment and management of1 neurological gaits, Pre and post-surgical assessment and treatment.

### Mapping of Course Outcomes with Programme Outcomes

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0801 | CO1 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 2 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| | CO3 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 2 |
| | CO4 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 2 |

**Course Contents: 48 Hours**

## UNIT-I

PHYSIOTHEAPY MANAGEMENT OF NEUROLOGICAL CONDITIONS IN ADULT

1. Stroke
2. Monoplegia
3. Brain tumours
4. Spinal cord tumours
5. Parkinsonism
6. Cerebellar lesion
7. Motor neuron disease
8. Disorder of the spinal cord – paraplegia, quadriplegia, syringomyelia, transverse myelitis, Spinal dyspharism
9. Head injury
10. Peripheral nerve injury
11. Guillain bare syndrome
12. Low back pain syndrome
13. Brachial neuralgia
14. Demyelination of the nervous system – multiple sclerosis
15. Disorder of the neuromuscular junction – myasthenia gravis
16. Viral meningitis
17. Tabes dorsalis

## UNIT-II

PHYSIOTHEAPY MANAGEMENT OF NEUROLOGICAL CONDITIONS IN CHILDREN

1. Cerebral palsy
2. Developmental delay
3. Spina bifida
4. Muscular dystrophy
5. Polio myelitis
6. Hydrocephalus
7. Brachial plexus injury- Erb’s palsy, Klumpke’s palsy.

## UNIT-III

1. Evaluation and Management of Cerebellar, Spinal Cord and Muscle Disorders: History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short- & Long-Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia Gravis, Eaton-Lambert Syndrome, Spinal tumors, Spinal cord injury, Transverse myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post Polio Syndrome.

2. Evaluation and Management of Peripheral Nerve Injuries and Disorders: History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short- & Long-Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudental nerve palsy.

**UNIT-IV**

1. Assessment and management of Neurological gaits: Quantitative and Qualitative (Kinetic & Kinematics) analysis, List of Problems, short- & Long-Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, waddling gait, Scissoring gait, Spastic gait, Choreiform Gait, Diplegic Gait, and Myopathic Gait
2. Pre and Post-surgical assessment and treatment following conditions - Spinal disc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid haemorrhages, epilepsy, Parkinson's disease, Chorea, Hemiballismus, Psychiatric

disorders, Malformations of the nervous system, Carotid artery stenosis, Arteriovenous malformations, and Spina bifida.

3. Applied Yoga in Neurological conditions.

**Recommended Textbooks:**

1. Tidy's physiotherapy.
2. Cash’s Textbook of Neurology for Physiotherapists
3. Neurological Rehabilitation by D. Umphred.
4. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz
5. Elements of Pediatric Physiotherapy-Eckersley.

| Course code B22HE0802 | COMMUNITY PHYSIOTHERAPY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **2** | **1** | **0** | **3** |

**Pre-requisites**

Basic of physiotherapy in different condition of disease and problem for body function.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. This course serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention.

**Course Outcomes**

1. **CO1**- Identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions
2. **CO2**- Plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.
3. **CO3** - Understand vocational training in rehabilitation and services.
4. **CO4** - Understand industrial health & ergonomic, physiology of aging /degenerative changes and related problem.

**Mapping of Course Outcomes with Programme Outcomes**

| Course code | POS /COS | PO 1 | PO 2 | PO 3 | PO4 | PO5 | PO6 | PO 7 | PO8 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0802 | CO1 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 2 | 2 | 2 | 3 |
| | CO2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 |
| | CO3 | 2 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO4 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 |

**Course Contents: 48 Hours**

## UNIT-I

1. Role of Social work in CBR: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation
2. Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies –National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, UNDP, UNFPA, FAO, ILO, World bank, USAID, SIDA, DANIDA, Rockfeller, Ford foundation, CARE, RED CROSS.
3. National District Level Rehabilitation Programme: Primary rehabilitation unit, regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker

## UNIT-II

1. Role of Physiotherapy in CBR: Screening for disabilities, prescribing exercise programme, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation programmes for various neuro musculoskeletal and cardiothoracic disabilities.
2. Screening and rehabilitation of paediatric disorders in the community: Early detection of high-risk babies, Maternal nutrition and education, Rehabilitation of Cerebral Palsy, Polio, Downs Syndrome, Muscular Dystrophies etc., Prevention and rehabilitation of mental retardation and Behavioural disorders, Immunization programmes, Early intervention in high-risk babies, Genetic counselling.
3. Extension services and mobile units: Introduction, Need, Camp approach.

## UNIT-III

1. Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services.
2. Geriatrics - Physiology of Aging /degenerative changes-Musculoskeletal /Neuromotor /cardio– respiratory- /Metabolic, Endocrine, Cognitive, Immune systems. Role of Physio Therapy in Hospital based care, Half- way homes, Residential homes, Meals on

wheels etc. Home for the aged, Institution based Geriatric Rehabilitation. Few conditions- Alzheimer's disease, Dementia, Parkinson's Disease, Incontinence, Iatrogenic drug reactions, etc. Ethics of geriatric Rehabilitation.

**UNIT-IV**

1. Industrial Health & Ergonomics - Occupational Hazards in the industrial area -- Accidents due to
    a. Physical agents-e.g.-Heat/cold, light, noise, Vibration, U.V. radiation, Ionizing radiation,
    b. Chemical Agents-Inhalation, local action, ingestion,
2. Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of work place-mechanical stresses per hierarchy –
    a. sedentary table work –executives, clerk,
    b. inappropriate seating arrangement- vehicle drivers
    c. constant standing- watchman- Defense forces, surgeons,
    d. Over-exertion in laborers, -common accidents –Role of P.T.-Stress management,
    e. Psychological hazards- e.g.-executives, monotonicity & dissatisfaction in job, anxiety of work completion with quality, Role of P.T. in Industrial setup & Stress management relaxation modes.
3. Biological Hazards

**Recommended Textbooks:**


1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De Lisa.

| Course code B22HE0803 | PRACTICAL: PHYSIOTHERAPY IN NEUROLOGY & PAEDIATRICS -II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of physiotherapy in neurology and paediatrics.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the neurologic and pediatric conditions.
2. To obtain knowledge regarding the neurologic and pediatric conditions.

**Course Outcomes**

1. **CO1**. Ready to demonstrate the characteristics basic the neurologic and pediatric conditions
2. **CO2**. Able to understand the treatment methods of neurologic and pediatric conditions.

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0803 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

Shall be conducted for all the relevant topics discussed in theory in the following forms: Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Bedside case presentations and case discussions of following important cases/ conditions-

1. Stroke
2. Parkinsonism
3. Disorder of the spinal cord – paraplegia, quadriplegia, Head injury
4. Peripheral nerve injury
5. Guillain bare syndrome
6. Low back pain syndrome
7. Brachial neuralgia
8. Demyelination of the nervous system – multiple sclerosis
9. Disorder of the neuromuscular junction – myasthenia gravis
10. Viral meningitis

NEUROLOGICAL CONDITIONS IN CHILDREN

1. Cerebral palsy
2. Developmental delay
3. Spina bifida
4. Muscular dystrophy
5. Poliomyelitis
6. Hydrocephalus
7. Brachial plexus injury – Erb's palsy, Klumke's palsy

**Recommended Textbooks:**


1. Tidy's physiotherapy.
2. Cash's Textbook of Neurology for Physiotherapists
3. Neurological Rehabilitation by D. Umphred.
4. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
5. Elements of Pediatric Physiotherapy-Eckersley.

| Course code B22HE0804 | PRACTICAL: COMMUNITY PHYSIOTHERAPY-II | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **2** | **2** |

**Pre-requisites**

Basics of community physiotherapy.

**Pedagogy**

Direct method, ICT, Collaborative learning, Flipped Classroom.

**Course Objective**

1. To understand the neurologic and pediatric conditions.
2. To obtain knowledge regarding the neurologic and pediatric conditions.

**Course Outcomes**

1. **CO1**. Ready to demonstrate the characteristics basic the neurologic and pediatric conditions
2. **CO2**. Able to understand the treatment methods of neurologic and pediatric conditions.

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0804 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

**Course Contents: 26 Hours**

**List of Practical / Demonstrations:**

This will consist of demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, pediatric, gynaecological and geriatric problems in community.

Demonstration of evaluation and prescription techniques for ambulatory and assistive devices,

Fabrication of low-cost assistive devices with locally available materials

**Recommended Textbooks:**

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De Lisa.

| Course code B22HE0805 | PROJECT WORK | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 6 hrs./week | | **0** | **0** | **4** | **4** |

**Course Objectives**

Project will be a clinical assignment on given topic or condition. This may be done in the form of a literature review. This will give the student a background on research methods and recent advances.

Method of assessment: Viva & Practical.

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0805 | CO1 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| | CO3 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | CO4 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |

| Course code B22HE0806 | CLINICAL POSTINGS- VI | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 3 hrs./week | | **0** | **0** | **3** | **3** |

**Course Objectives**

Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision.

Evidence based practice will be part of training:

1. General Surgery & CTS ICU
2. Developmental pediatric & Child Guidance Clinic
3. OBG
4. Geriatric – Old Age Homes
5. Industrial Visits – Ergonomics.

**Mapping of Course Outcomes with Programme Outcomes**

| Course Code | POS/ COs | PO1 | P02 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B22HE0806 | CO1 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |
| | CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 |
| | CO3 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 2 |

## INTERNSHIP

| Course code B22HE0901 | INTERNSHIP | L | T | P | C |
|---|---|---|---|---|---|
| **Duration:** 6 months | | **0** | **0** | **15** | **15** |

**Course Objectives**

Weekly contact hours- **36 hours**

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

The 6 months of rotational posting must be covered in the following pattern-

| Sl. No | Area of posting | Duration |
|---|---|---|
| 1. | Physiotherapy OPD (including Paediatrics and OBG wards) | 1 month |
| 2. | Orthopaedic wards | 1 month |
| 3. | General Medicine wards (including MICU and CCU) | 1 month |
| 4. | General Surgery wards (including CTS wards, CTS-ICU and Burns) | 1 month |
| 5. | Neurology and Neurosurgery wards (including Neuro ICU) | 1 month |
| 6. | Community Posting PHC | 1 month |

Successful Completion – 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.

## CAREER DEVELOPMENT AND PLACEMENT

Having a degree will open doors to the world of opportunities for you. But employers are looking for much more than just a degree. They want graduates who stand out from the crowd and exhibit real life skills that can be applied to their organizations. Examples of such popular skills employers look for include:

1. Willingness to learn
2. Self-motivation
3. Teamwork
4. Communication skills and application of these skills to real scenarios
5. Requirement of gathering, design and analysis, development and testing skills
6. Analytical and Technical skills
7. Computer skills
8. Internet searching skills
9. Information consolidation and presentation skills
10. Role play
11. Group discussion, and so on

REVA University therefore, has given utmost importance to develop these skills through variety of training programs and such other activities that induce the said skills among all students. A full-fledged Career Counselling and Placement division, namely Career Development Center (CDC) headed by well experienced senior Professor and Dean and supported by dynamic trainers, counsellors and placement officers and other efficient supportive team does handle all aspects of Internships and placements for the students of REVA University. The prime objective of the CDC is to liaison between REVA graduating students and industries by providing a common platform where the prospective employer companies can identify suitable candidates for placement in their respective organization. The CDC organizes pre-placement training by professionals and arranges expert talks to our students. It facilitates students to career guidance and improves their employability. In addition, CDC forms teams to perform mock interviews. It makes you to enjoy working with such teams and learn many things apart from working together in a team. It also makes you to participate in various student clubs which helps in developing team culture, variety of job skills and overall personality.

The need of the hour in the field of Physiotherapy is not only knowledge in the subject, but also the skill to do the job proficiently, team spirit and a flavour of innovation. This kept in

focus; the CDC has designed the training process, which will commence from second semester along with the curriculum. Special coaching in personality development, career building, English proficiency, reasoning, puzzles, and communication skills to every student of REVA University is given with utmost care. The process involves continuous training and monitoring the students to develop their soft skills including interpersonal skills that will fetch them a job of repute in the area of his / her interest and march forward to make better career.

The School of Allied Health Sciences also has emphasized subject based skill training through lab practice, internship, project work, clinical postings and many such skilling techniques. Special training is also arranged for those interested

in entrepreneurial venture. The students during their day-to-day studies are made to practice these skill techniques as these are inbuilt in the course curriculum. Concerned teachers also continuously guide and monitor the progress of students.

The University has also established University-Industry Interaction and Skill Development Centre headed by a Senior Professor & Director to facilitate skill related training to REVA students and other unemployed students around REVA campus. The center conducts variety of skill development programs to students to suite to their career opportunities. Through this skill development centre, the students shall compulsorily complete at least two skills / certification-based programs before the completion of their degree. The University has collaborations with Industries, Corporate training organizations, research institutions and Government agencies like NSDC (National Skill Development Corporation) to conduct certification programs. REVA University has been recognised as a Centre of Skill Development and Training by NSDC (National Skill Development Corporation) under Pradhan Mantri Kaushal Vikas Yojana.

The University has also signed MOUs with Multi-National Companies, research institutions, and universities abroad to facilitate greater opportunities of employability, students' exchange programs for higher learning and for conducting certification programs.

## FACULTY PROFILE

| Name of faculty | Designation |
|---|---|
| **Dr JayashreeS** | Prof. & HOD<br>School Allied Health Sciences<br>REVA University |
| **Mrs. Meghana MV** | Assistant Professor<br>School of Allied Health Sciences<br>REVA University |
| **Dr. RameshKumar Kushwaha** | Assistant Professor,<br>School of Allied Health Sciences<br>REVA University |
| **Mr. Abhilash G. L** | Assistant Professor<br>School ofAllied Health Sciences<br>REVA University |
| **Mr. Jismon Jose** | Assistant Professor<br>School ofAllied Health Sciences<br>REVA University |