YENEPOYA UNIVERSITY

Deralakatte, Mangaluru - 575018

REGULATIONS AND CURRICULUM GOVERNING

UNDERGRADUATE PROGRAM

BACHELOR OF PHYSIOTHERAPY

(REVISED CURRICULUM – AMENDED UP TO 2016)

YENEPOYA
UNIVERSITY

Recognized under Sec 3(A) of the UGC Act 1956 as per Notification No. F.9-11/2007-U.3 (A) dated 27th February 2008

Ref: No. YU/REG/ACA/23-ACM/2016 05.04.2016

NOTIFICATION

Sub: Introduction of Semester System to B.P.T. Course from the academic year 2016-17

Ref: (1) Meeting of the Expert Committee on 15.03.2016
(2) Meeting of the BoS, Physiotherapy on 23.02.2016
(3) Meeting of the Faculty of Allied Health & Basic Sciences on 15.03.2016
(4) 23rd Meeting of the Academic Council held on 28.03.2016 (Agenda -9)

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The Ministry of Health & Family Welfare, Govt. of India has released model curriculum in 2015 for BPT course proposing semester system. This matter was informally discussed at various stages including students, alumni and Faculty and was in principle agreed to.

Consequently, the proposal was discussed by the Board of Studies, Physiotherapy, Expert Committee and then Faculty of Allied Health & Basic Sciences. These bodies have unanimously recommended for introduction of the semester system for the BPT course from 2016-17 and submitted the draft syllabus.

The subject matter was placed before the Academic Council. After exhaustive deliberation, the Academic Council approved the introduction of semester system to BPT course together with the draft syllabus.

This notification is issued for implementation from the academic year 2016-17.

REGISTRAR

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Registrar
Yenepoya University
University Road, Deralakatte
Mangalore - 575 018

To: Principal – YPC

Copy to:

1. CoE
2. Academic Section

University Road, Deralakatte, Mangalore-575018
T: +91 824 220 4676 / 4668 /4669 / 4671/ 2192 / 2193 F : +91 824 220 4667 E : reachus@yenepoya.org
www.yenepoya.edu.in

Vision

To provide access to quality higher education, ensuring equity, to create a vibrant knowledge capital and to create inspiring leaders of tomorrow who can take this country to the forefront of the developed nations.

Mission

- To achieve academic excellence and global competencies among students.
- To create an environment for the generation of new knowledge through meaningful research, adopting latest methods of pedagogy and incorporating modern principles of academics integrated with highest ethical standards.
- To extend the knowledge acquired and new knowledge generated for the development of the community.

Objectives

- To be at the forefront of innovation by consistently up dating curriculum, course content and practices enabling the students to be competent and well versed in the respective field of study.
- Provide use of cutting-edge technology and resources available to ensure effective transaction of the course content.
- To complement classroom learning with interactive learning systems and hands on learning by creating a collaborative Industry University Interface.
- Provide freedom to continuously evaluate the evaluation systems and be at the forefront of innovation to enable and incorporate best practices.
- To promote research in the frontier areas of the subject by encouraging the faculty and students by inculcating ethical principles in research.
- To facilitate knowledge exchange by organizing seminars, symposia, workshops, lectures and other such activities.
- To facilitate communication and collaboration with academia, industry and society.
- To create advanced centers of research by developing state-of-the art facilities and meaningful collaborations.
- To sensitize the students towards the social responsibilities by incorporating value education system.
- To extend the university services to the community for building a healthy, empowered and sustainable society.
- To build human resources and develop technologies to respond to the professional needs of the society.
- To take up extension and outreach programs to serve the community.

List of Abbreviations

AED	Automated External Defibrillator
AHP	Allied and Healthcare Professional
BLS	Basic Life Support
BMW	Bio Medical Waste
B.Sc	Bachelor of Science
BVMs	Bag Value Masks
CATS	Credit Accumulation and Transfer System
CBCS	Choice-Based Credit System
CbD	Case-based Discussion
CBSE	Central Board of Secondary Education
CNS	Central Nervous System
CPR	Cardiopulmonary Resuscitation
CPU	Central Processing Unit
CR	Confidential Report
CVS	Cardio Vascular System
DOPs	Direct observation of procedures
ECTS	European Credit Transfer System
ESR	Erythrocyte Sedimentation Rate
HSSC	Healthcare Sector Skill Council
ICT	Information & Communication Technology
JCI	Joint Commission International
LAN	Local Area Network
M CEX	Mini Case Evaluation Exercise
MoHFW	Ministry of Health and Family Welfare

NABH	National Accreditation Board for Hospitals & Healthcare Providers
NCRC	National Curricula Review Committee
NIAHS	National Initiative for Allied and Healthcare Sciences
NSDA	National Skills Development Agency
NSQF	National Skills Qualification Framework
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
OSLER	Objective Structured Long Examination Record
PCV	Packed Cell Volume
PPE	Personal Protective Equipment
PG	Post Graduate
TSU	Technical Support Unit
UGC	University Grants Commission
UG	Under Graduate
UHC	Universal Health Coverage
WHO	World Health Organization
WWW	World Wide Web
LF	Low Frequency
MF	Medium Frequency
HF	High Frequency

Regulations Governing BPT Degree Course

These ordinances shall be called "The Ordinances, Syllabus and Scheme of Examination pertaining to the Bachelor of Physiotherapy course, BPT."

Background of the profession

Statement of Philosophy– Why this profession holds so much importance

Physiotherapy practice spans the continuum from health promotion to prevention to rehabilitation for individuals and populations throughout the lifespan. Physiotherapy diagnoses movement dysfunctions based on skillful examination and evaluation regardless of the cause or etiology and provide skilled therapeutic intervention to foster improvement in physical functioning and maximizing overall quality of life. Physiotherapists provide the initial access into the health care system for persons with impairments and functional limitations amenable to physiotherapy and engage in collegial referral relationships with other health care professionals.

Physiotherapist's role also includes that of case manager, teacher, researcher, and consultant. The faculty believes the priority of education is to prepare people for a well-rounded, balanced life with broad social and cultural interests and as involved, active citizens of our country.

Physiotherapist must have commitments to lifelong learning and to search for the evidence that supports and advances practice. Critical thinking, problem solving, intellectual perseverance and courage are all essential characteristics of the successful physiotherapist.

About Physiotherapy

Physiotherapists are health care professionals with a significant role in health promotion and treatment of injury and diseases. They combine their in-depth knowledge of the body and how it works with specialized hands-on clinical skills to assess, diagnose and treat symptoms of illness, injury or disability.

All physiotherapists registered to practice are qualified to provide safe and effective physiotherapy. They have met national entry-level education and practice standards and have successfully passed a standardized physiotherapy competence examination.

Scope of practice

Physiotherapists plan and administer physiotherapy/ rehabilitation treatments independently and also being a part of the multidisciplinary team. The minimum education requirement is often a baccalaureate degree or postgraduate degrees in Physiotherapy.

Physiotherapy is an essential part of the health and community/welfare services delivery system. Physiotherapists practice independently of other health care/service providers and within multidisciplinary rehabilitation/habilitation programmes to prevent, gain, maintain or restore optimal function and quality of life in individuals with loss and disorders of movement.

Physiotherapists are guided by their own code of ethical principles. Thus, they may be concerned with any of the following purposes:

1. Promoting the health and well-being of individuals and the general public/society, emphasizing the importance of physical activity and exercise.
2. Preventing impairments, activity limitations, participatory restrictions and disabilities in individuals at risk of altered movement behaviors due to health or medically related factors, socio-economic stressors, environmental factors and lifestyle factors.
3. Providing interventions/treatment to restore integrity of body systems essential to movement, maximize function and recuperation, minimize incapacity, and enhance the quality of life, independent living and workability in individuals and groups of individuals with altered movement behaviors resulting from impairments, activity limitations, participatory restrictions and disabilities
4. Modifying environmental, home and work access and barriers to ensure full participation in one's normal and expected societal roles

Physiotherapists may also contribute to the development of local, national and international health policies and public health strategies.

Settings in which physiotherapy is practiced

Physiotherapy is delivered in a variety of settings which allow it to achieve its purpose. Prevention, health promotion, treatment/intervention, habilitation and rehabilitation take place in multiple settings that may include, but are not confined to, the following:

1. Community based rehabilitation programmes
2. Community settings including primary health care centers, individual homes, and field settings
3. Education and research centers
4. Fitness clubs, health clubs, gymnasia and spas
5. Hospices
6. Hospitals
7. Nursing homes
8. Occupational health centers
9. Out-patient clinics
10. Physiotherapist private offices, practices, clinics
11. Prisons
12. Public settings (e.g., shopping malls) for health promotion
13. Rehabilitation centers and residential homes
14. Schools, including pre-schools and special schools
15. Senior citizen centers
16. Sports centers/clubs
17. Workplaces/companies

Recognition of Title

Within the multidisciplinary team, the professional responsible for administrating physiotherapy treatment also at times referred to as the physiotherapist. The terminology Physiotherapist is an internationally adopted nomenclature and thus should also be applicable in an Indian context.

The recommended title thus stands as the "Physiotherapist" with the acronym – "PT" for this group of professionals.

Definition of Physiotherapy and Physiotherapist

"Physiotherapy means a system which includes comprehensive examination, treatment, advice and instructions to any persons preparatory to or for the purpose of or in connection with movement/functional dysfunction, bodily malfunction, physical disorder, disability, healing and pain from trauma & disease, physical and mental conditions using physical agents, activities & devices including exercise, mobilization, manipulations, electrical & thermal agents and other electro therapeutics for prevention, screening, diagnosis, treatment, health promotion and fitness."

This includes treatment preparation, planning, treatment delivery, clinical and rehabilitative care of the patient on a daily basis during treatment and immediate post treatment review. However, the role of the PT always encompasses the safe and accurate delivery of the physiotherapy treatment. As the physiotherapy professional in daily contact with the patient it also includes monitoring of daily improvement of the patient according to his/her condition. Furthermore, the PTs liaise with all the other associated professionals in ensuring that the needs of the patient are met.

Physiotherapists assess, plan and implement rehabilitative programs that improve or restore human motor functions, maximize movement ability, relieve pain syndromes, and treat or prevent physical challenges associated with injuries, diseases and other impairments. They apply a broad range of physical therapies and techniques such as movement, ultrasound, heating, laser and other techniques. They may develop and implement programmes for screening and prevention of common physical ailments and disorders.

Education of the Physiotherapist

When developing any education programme it is necessary that programme planning should be outcome-based, meeting local and national manpower requirements, personal satisfaction and career potential for the professionals with supporting pathway in the development of the profession. One of the major changes is the shift from a focus based on traditional theoretical

knowledge and skills to competency-based education and training. Optimal education/training requires that the student can integrate knowledge, skills and attitude in order to perform a professional act adequately in a given situation.

Thus, the following curriculum aims to focus on skills and competencies-based approach for learning and are designed accordingly.

Entry requirements

A Candidate seeking admission to first year Bachelor in Physiotherapy (BPT):
i) Should have passed two-yearPre-University examination conducted by Department of Pre-University Education, Karnataka State, with English as one of the courses and Physics, Chemistry and Biology as optional courses. The candidate shall have passed courses of English, Physics, Chemistry and Biology as optional courses. The candidate shall have passed courses of English, Physics, Chemistry and Biology individually also.

OR

ii) Shall have passed any other examination conducted by Boards/Councils/Intermediate examination established by State Government/Central Government and recognized as equivalent to a two year Pre University Examination by Yenepoya University/ Association of Indian Universities (AIU), with English as one of the courses and Physics, Chemistry and Biology as optional courses. The candidate shall have passed courses of English, Physics, Chemistry and Biology as optional courses. The candidate shall have passed courses of English, Physics, Chemistry and Biology individually also.

OR

iii)Candidates who have completed Pre-university course with Vocational Physiotherapy as their optional course are eligible for admission to BPT course.

Course duration

Minimum duration to qualify as an entry level professional in physiotherapy is **4 years (8 semesters) and 6 months program (internship) – Bachelor's degree level**

The emphasis initially is on the academic content establishing a strong scientific basis and in the later year on the application of theory to clinical/reflective practice. In Bachelor degree program minimum one year (from 2nd year onwards) is devoted to clinical practice and this should be on a continuum of rotation from theory to practice over the program. The aim of4 ½ degree program is to enable the development of the PT as a key member of the multidisciplinary team and to enable him/her to execute advanced preparation/ planning/delivery of physiotherapy treatment as well as quality assurance.

With the change in the disease dynamics and multifold increase in the cases needing

physiotherapy treatment, it is imperative that a well-structured program of postgraduate education is also encouraged so as to enhance research capacity within the country to widen the scope of clinical practice for the profession.

Teaching faculty and infrastructure

Both the physical infrastructure and the teaching staff must be adequate. Teaching areas should facilitate different teaching methods. Large lecture theatres may be appropriate, but smaller teaching areas should also be provided for tutorial and problem/case-based learning approaches.

It is recommended that a faculty and student ratio of 1:3 for PG and for UG 1:10 to be followed.

Job availability

As per ILO documentation, employers worldwide are looking for job applicants who not only have technical skills that can be applied in the workplace, but who also can communicate effectively, including with customers; can work in teams, with good interpersonal skills; can solve problems; have good ICT skills; are willing and able to learn; and are flexible in their approach to work.Graduates can expect to be employed in hospitals and private practices as physiotherapists. A career in research, following the completion of a higher degree such as a PhD, is an option chosen by some graduates. Graduates are eligible for employment overseas where their qualifications, training and experience are highly regarded.

Graduates have good employment prospects and will enter a field in which the demand for professionals has increased in recent years and will keep on increasing due to chronic conditions, lifestyle change. An ageing population requiring increased medical rehabilitation services, together with the continuing introduction of hi-tech equipment, ensures strong demand for future graduates.

Curriculum of Bachelor of Physiotherapy (BPT)

Background

The need for quality in treatment is a critical component of physiotherapy and requires knowledge and understanding of the basic sciences as well as the interaction between the techniques and procedures used in physiotherapy. In an era of greater complexity of technology and techniques, the role of the physiotherapist (PT) and his/her level of responsibility is continually evolving and expanding. Given the complexity of modern physiotherapy, the recognition of the profession of PT and development of dedicated education programmes specific to that profession must be addressed. Education programmes should provide the PT with the scientific theoretical foundation of the profession and enable them, as practitioners, to be able to synthesize, evaluate and apply their knowledge in a clinical setting.

The aims of the recommended curriculum are to produce PTs who are

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

All aspects of physiotherapy have been considered in the development of this curriculum together with the identification of the roles expected for different levels of physiotherapists based on their qualification and experience. The need for connecting the dots between the education and employment practices has been the road map for devising this curriculum

Foundation course has also been designed to bring all the students at the same level of understanding with respect to basic healthcare related norms before the start of a career in a healthcare professional course. The foundation course is mandatory for all the allied and healthcare professional courses and for entry level courses also.

Bachelors of Physiotherapy (BPT)

Introduction:

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

1. The purpose of this curriculum is to delineate the cognitive, affective and psychomotor skills deemed essential for completion of this program and to perform as a competent physiotherapist who will be able to examine, evaluate, diagnose, plan, execute and document physiotherapy treatment independently or along with the multidisciplinary team.
2. Evaluate patients for impairments and functional limitations and able to execute all routine physiotherapeutic procedures as per the evaluation.
3. Able to operate and maintain physiotherapy equipment used in treatment of patient, physiotherapy treatment planning (both electrotherapy and exercise therapy) & procedures independently.
4. Able to provide patient education about various physiotherapeutic interventions to the patient and care givers.

Expectations from the future physiotherapy graduates

1. Coursework entitles independent physiotherapy assessment and treatment in any healthcare delivery centers in India by the graduates.
2. The coursework is designed to train students to work as independent physiotherapists or in conjunction with a multidisciplinary team to diagnose and treat movement disorders as per

red and yellow flags.

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

Programme Outcomes

After successful completion of the 4½ years programme the student will be able to

PO 01- Understands the structure, function, and dysfunction of various body organs and movement

PO 02- Competent to examine, evaluate, diagnose, plan, execute and document physiotherapy treatment independently or along with the multidisciplinary team inmovement impairments and functional limitations as per red and yellow flags in any healthcare delivery setting

PO 03- Operate, maintain and document physiotherapy equipment used in treatment of patient, physiotherapy treatment planning and procedures independently.

PO 04- Be able to appreciate adverse effects associated with physical therapy modalities and procedures, their safety procedures and management strategies

PO 05- Be able to appreciate the psychosocial logical, cultural, economic and environmental factors affecting health and promote health, wellness and fitness in community.

PO 06- Competent and reflective physiotherapy practitioner who can function safely and effectively while adhering to legal, ethical and professional standards of practice in a multitude of physiotherapy settings for patients and clients across the lifespan and along the continuum of care from wellness and prevention to rehabilitation of dysfunction.

PO 07- Utilize critical inquiry and evidence-based practice to make clinical decisions essential for autonomous practice.

PO 08- Function as an active member of professional and community organizations; service-oriented advocate dedicated to the promotion and improvement of community health.

PO 09- Acquire effective communication and leadership skills to work as member of multidisciplinary team and provide patient education about various physiotherapeutic interventions to the patient and care givers

PO 10- Appreciates the necessity for lifelong commitment to learning and continuous professional development and understand basic research process to conduct scientific studies and disseminate new knowledge.

PO 11- Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, hospital management, inventory skills and counselling.

Eligibility for admission:

Selection procedure:

The selection of students to the course of Physiotherapy shall be based on merit provided that**:**

a) In case of admission on the basis of qualifying examination, a candidate for admission to BPT course must have passed individually in the courses of Physics, Chemistry, Biology and English and must have obtained not less than 40% marks taken together in Physics, Chemistry and Biology in the qualifying examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Category I, the marks obtained in Physics, Chemistry and Biology together in qualifying examination must not be less than 35% instead of 40% as above.

b) Candidates who have studied abroad and have passed the equivalent qualification as determined by the Association of Indian Universities will form the guideline to determine the eligibility and must have passed in the courses: Physics, Chemistry, Biology and English up to 12th Standard level.

c) Candidates who have passed the Senior Secondary school Examination of National Open School with a minimum of 5 courses with any of the following group courses.
   1. English, Physics, Chemistry, Botany, Zoology
   2. English, Physics, Chemistry, Biology and any other language

d) Candidate having at least one-year diploma in Yoga will be given preference in admission, provided he meets any of the above eligibility criteria also.

A candidate seeking admission to Bachelor of Physiotherapy course should have completed 17 years of age, as on 31st December of the year of admission.

Every candidate before admission to the course shall furnish to Principal of the Institution a certificate of Medical Fitness from an authorized Government Medical Officer to the effect, that the candidate is physically fit to undergo Physiotherapy course.

Admission to Bachelor of Physiotherapy course shall be made based onthe eligibility and an entrance test to be conducted for the purpose. No candidate will be admitted on any ground unless he/she has appeared in the admission test and interview.

- Entrance test, to be conducted by the university as per the syllabus under 10 +2 scheme
- Successful candidates based on written test will be called for counseling(s) nominated by the University or the board.
- During subsequent counseling (s) the seat will be allotted as per the merit of the candidate depending on the availability of seats on that day.
- Candidate who fails to attend the Medical Examination on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent

authority under special circumstances.

- The name of the student(s) who remain(s) absent from classes for more than 15 days at a stretch after joining the said course without giving any notice will be governed as per the respective University rules.

Duration of the course (4 ½ Years): 4 years (8 semesters), (A total of 4345 hours in theory, practical& clinical). And a compulsory rotatory internship for a duration of 6 months.

Total hours - 5451

Medium of instruction:
English shall be the medium of instruction for all the courses of study and for examination of the course.

Attendance:
A candidate must secure -

1. **Minimum of 75%** attendance in **theoretical**
2. **Minimum of 85%** in **Skills training (practical)** for qualifying to appear for the final examination.

No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc.

Assessment: Assessments should be completed by the academic staff, based on the compilation of the student's theoretical &clinical performance throughout the training program. To achieve this, all assessment forms and feedback should be included and evaluated. The passing marks for every course in the semester should be 50% marks in aggregate in theory and practical.

Commencement of the course: The course shall commence not later than 1stSeptember of an academic year.

Commencement of examination: University examination shall be conducted at the end of each semester (December/January &June/July).

Working days during the semester -
Each semester shall consist not less than 100 working days excluding examination days.

Curriculum Outline

Distribution of Courses and its Teaching Hours

First Semester (0-6 months)					
Course code	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
AP01PT 101	Human Anatomy-I	60	75	135	9
AP01PT 102	Human Physiology - I	60	30	90	6
AP01PT 103	General and Clinical Psychology	45	15	60	4
Foundation course - Not for university examination					
AP01PT 1S1	Introduction to Healthcare Delivery System in India	30	--	30	2
AP01PT 1S2	Basic computer and information science	15	30	45	3
AP01PT 1S3	English, Communication and soft skills	30	15	45	3
AP01PT 1S4	Kannada	15	15	30	2
AP01PT 1S5	Professionalism and values	15	--	15	1
	PBL/Assignment/ICT learning	--	--	45	3
	Community orientation and clinical visit	--	--	45	3
	Total	**270**	**180**	**540**	**36**

Second Semester (7 – 12 months)					
Sl. No.	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
AP01PT 201	Human Anatomy-II (Including Applied Anatomy)	60	90	150	10
AP01PT 202	Human Physiology -II (Including Applied Physiology)	60	45	105	7
AP01PT 203	Biochemistry	45	15	60	4
AP01PT 204	Basic principles of Biomechanics	45	30	75	5
Foundation course - Not for university examination					
AP01PT 2S1	Medical terminology and record keeping	30	--	30	2
	PBL/Assignment/Integrated seminar	--	--	45	3
	Clinical observation	--	--	75	5
	Total	**240**	**180**	**540**	**36**

Third Semester (13-18 months)					
Course code	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
AP01PT 301	Pathology	45	15	60	4
AP01PT 302	Microbiology	45	15	60	4
AP01PT 303	Biomechanics and kinesiology	75	75	150	10
AP01PT 304	Exercise therapy I (Foundation concepts and therapeutic massage)	50	80	130	10
Foundation course – Not for university examination					
AP01PT 3S1	Introduction to quality and patient safety (Including Emergency care, BLS, Biomedical waste management, Infection prevention and control, etc.)	20	30	50	3
	Clinical observation	--	--	90	5
	Total	**235**	**215**	**540**	**36**

Fourth Semester (19-24 months)					
Course code	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
AP01PT 401	Exercise Therapy II	75	105	180	12
AP01PT 402	Electrotherapy I (Bio physics, LF & Equipment care)	50	75	125	9
AP01PT 403	Community Medicine	60	--	60	3
AP01PT404	Pharmacology	45	--	45	4
Foundation course –Not for university examination					
AP01PT 4S1	Medical/ Physiotherapy Law and Ethics	30	--	30	2
	Clinical Education	--	100	100	6
	Total	**260**	**280**	**540**	**36**

Fifth Semester (25-30 months)					
Course code	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
AP01PT 501	Clinical Orthopedics &Traumatology	60	--	60	4
AP01PT 502	General Surgery including burns and plastic surgery	60	--	60	5
AP01PT 503	Obstetrics and Gynecology				
AP01PT 504	General Medicine, Paediatrics& psychiatry	60	--	60	5
AP01PT 505	Electrotherapy II (MF, HF and Equipment care)	40	70	110	8
Foundation course –Not for university examination					
AP01PT 5S1	Evaluation Methods & Outcome Measures	20	25	45	3
AP01PT 5S2	Diagnostic imaging for Physiotherapist	15	--	15	1
	Clinical Education	--	190	190	10
	Total	**255**	**285**	**540**	**36**

Sixth Semester (31-36 months)					
Course code	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
AP01PT 601	Physiotherapy in Orthopedics & Sports	60	75	135	8
AP01PT 602	Physiotherapy In General Medicine and General surgery	60	75	135	8
AP01PT 603	Clinical Neurology & Neurosurgery	60	--	60	4
AP01PT 604	Sociology	45	--	45	3
Foundation course –Not for university examination					
	Clinical Education	--	190	190	13
	Total	**225**	**340**	**565**	**36**

Seventh Semester (37-42 months)					
Course code	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
AP01PT 701	Physiotherapy in Neurology & psychosomatic disorder	60	75	135	9
AP01PT 702	Biostatistics				
AP01PT 703	Research Methodology	60	--	60	4
AP01PT 704	Health Promotion and Fitness	15	30	45	3
AP01PT 705	Clinical cardiovascular & pulmonary conditions	60	--	60	4
Foundation course –Not for university examination					
AP01PT 7S1	Principles of Management	30	--	30	2
AP01PT 7S2	Critique inquiry, case presentation and discussion	--	15	15	1
	Clinical Education	--	195	195	13
	Total	**225**	**315**	**540**	**36**

Eighth Semester (43-48 months)					
Course code	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
AP01PT 801	Physiotherapy in cardiovascular, pulmonary & intensive care	60	75	135	9
AP01PT 802	Community Physiotherapy	45	45	90	6
AP01PT 803	Clinical reasoning & Evidence based physiotherapy	15	15	30	2
AP01PT 804	Administration and Teaching Skills	15	30	45	3
AP01PT 8PR	Research Project	15	30	45	3
	Clinical education	--	195	195	13
	Total	**150**	**390**	**540**	**36**

INTERNSHIP
INTERNSHIP – Intern should complete minimum of 158 working days over six months of time with minimum of 1106 hours (calculated based on 7 hours per day, if 158 working days in 6-month span)

INTERNAL ASSESSMENT(IA):

It shall be based on evaluation of periodic tests assignments, clinical presentations etc., regular periodic examinations should be conducted throughout the course. There should be a minimum of two (2) sessional examinations during every semester. The average of the two examination marks should be reduced to 20 and 10 for Theory and Practical/Clinical respectively and sent to the University before the University examination as per notification. Proper record which forms the basis of the Internal Assessment should be maintained for all students and should be available for scrutiny. The marks of periodical tests should be displayed on the student notice board by the principal.

A Candidate must obtain 50% marks in theory and practical separately in internal assessment to be eligible to write the university examination.

Attendance:

A candidate must secure -

- ✓ minimum**75%** attendance in theoretical
- ✓ minimum**85%** in Skills training (practical/Clinical) for qualifying to appear for the final examination.

No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc.

SCHEDULE OF EXAMINATION

There will be one university examinations at the end every semester, to be conducted as per notification issued by the University from time to time. Total of eight semesters shall be conducted during the course period. The particulars of courses for various examinations and distribution of marks are shown separately in below Tables.The examination for main courses shall be conducted by the University and non-university exam papers to be conducted by the college.

SCHEME OF EXAMINATION

A. Courses and Distribution of Marks for University Examination

First Semester (0-6 months)								
Sl. No	Courses	**Theory**				**Practical**		Total
		Written		Viva-voce	IA	Practical	IA	
		Time	Max.Marks	Max. Marks.	Max. Marks.	Max. Marks	Max. Marks	Max. Marks
1	**AP01PT 101** Human Anatomy-I	3	100	30	20	40	10	200
2	**AP01PT 102** Human Physiology -I	3	100	30	20	40	10	200
3	**AP01PT 103** General and Clinical Psychology	2	40	--	10	--	--	50

IA-Internal Assessment **Max.Marks- Maximum marks**

Second Semester (7 – 12 months)								
Sl. No.	Courses	**Theory**				**Practical**		Total
		Written		Viva-voce	IA	Practical	IA	
		Time	Max. Marks	Max. Marks.	Max. Marks	Max. Marks	Max. Marks.	Max. Marks
1.	**AP01PT 201** Human Anatomy-II(Including Applied Anatomy)	3	100	30	20	40	10	200
2	**AP01PT 202** Human Physiology – II(Including Applied Physiology)	3	100	30	20	40	10	200
3	**AP01PT 203** Biochemistry	3	80	--	20	--	--	100
4	**AP01PT** principles of Biomechanics	3	80	--	20	--	--	100

IA-Internal Assessment. Max.Marks- Maximum marks

Third Semester (13– 18 months)								
Sl. No	Courses	Theory				Practical		Total
		Written		Viva-Voce	IA	Practical	IA	
		Time	Max. Marks	Max. Marks.	Max. Marks	Max. Marks	Max. Marks.	Max. Marks
1.	**AP01PT 301** **Section-A** Pathology	3	40	--	10	--	--	100
	AP01PT 302 **Section-B**Microbiology		40	--	10	--	--	
2	**AP01PT 303** Biomechanics and kinesiology	3	100	30	20	40	10	200
3	**AP01PT 304** **Exercise Therapy-I**(Foundation concepts and therapeutic massage	3	100	30	20	40	10	200

IA-Internal Assessment **Max.Marks- Maximum marks**

Fourth Semester (19-24 months)								
Sl. No.	Courses	Theory				Practical		Total
		Written		Viva-Voce	IA	Practical	IA	
		Time	Max. Marks	Max. Marks.	Max. Marks	Max. Marks	Max. Marks.	Max. Marks
1	**AP01PT 401** Exercise Therapy-**II**	3	100	30	20	40	10	200
2	**AP01PT 402** Bio physics & Electrotherapy -**I** (LF& Equipment care)	3	100	30	20	40	10	200
3	**AP01PT 403** Community Medicine	3	80	--	20	--	--	100
4	**AP01PT 404** Pharmacology	3	80	--	20	--	--	100

IA-Internal Assessment **Max.Marks- Maximum marks**

Fifth Semester (25-30 months)								
Sl. No.	Courses	Theory				Practical		Total
		Written		Viva-Voce	IA	Practical	IA	
		Time	Max. Marks	Max. Marks.	Max. Marks	Max. Marks	Max. Marks.	Max. Marks
1	**AP01PT 501** Clinical Orthopedics &Traumatology	3	80	--	20	--	--	100
2	**AP01PT 502** **Section-A** General Surgery including burns and plastic surgery	3	40	--	10	--	--	100
	AP01PT 503 **Section-B** Obstetrics and Gynecology		40	--	10	--	--	
3	**AP01PT 504** General Medicine, Paediatrics& psychiatry	3	80	--	20	--	--	100
4	**AP01PT 505** Electrotherapy II (MF , HF & Equipment care)	3	100	30	20	40	10	200

IA-Internal Assessment **Max.Marks- Maximum marks**

Sixth Semester (31-36 months)								
Sl. No.	Courses	Theory				Practical		Total
		Written		Viva-Voce	IA	Practical	IA	
		Time	Max. Marks	Max. Marks.	Max. Marks	Max. Marks	Max. Marks.	Max. Marks
1	**AP01PT 601** Physiotherapy in Orthopedics & sports	3	100	30	20	40	10	200
2	**AP01PT 602** Physiotherapy in General Medicine and General surgery	3	100	30	20	40	10	200
3	**AP01PT 603** Clinical Neurology & Neurosurgery	3	80	--	20	--	--	100
4	**AP01PT 604** Sociology	2	40	--	10	--	--	50

IA-Internal Assessment **Max.Marks- Maximum marks**

Seventh Semester (37-42 months)								
Sl. No.	Courses	Theory				Practical		Total
		Written		Viva-Voce	IA	Practical	IA	
		Time	Max. Marks	Max.Marks	Max. Marks	Max. Marks	Max. Marks.	Max. Marks
1	**AP01PT 701** Physiotherapy in Neurology & psychosomatic disorder	3	100	30	20	40	10	200
2	**AP01PT 702** **Section A-** Biostatistics	3	40	--	10	--	--	100
	AP01PT 703 **Section B-** Research Methodology		40	--	10	--	--	
3	**AP01PT 704** Health Promotion and Fitness	2	40	--	10	--	--	50
4	**AP01PT 705** Clinical cardiovascular & pulmonary	3	80	--	20	--	--	100

IA-Internal Assessment **Max.Marks- Maximum marks**

Eighth Semester (43-48 months)								
Sl. No.	Courses	Theory				Practical		Total
		Written		Viva-Voce	IA	Practical	IA	
		Time	Max. Marks	Max. Marks.	Max. Marks	Max. Marks	Max. Marks.	Max. Marks
1	**AP01PT 801** Physiotherapy in cardiovascular,pulmonary& intensive care	3	100	30	20	40	10	200
2	**AP01PT 802** Community Physiotherapy	3	100	30	20	40	10	200
3	**AP01PT 803** **Section- A** Clinical reasoning & Evidence based physiotherapy	3	40	--	10	--	--	100
	AP01PT 804 **Section- B** Administration and Teaching Skills		40	--	10	--	--	
4	**AP01PT 8PR** Project	--	--	80	20	--	--	100

IA-Internal Assessment **Max.Marks- Maximum marks**

B. **QUESTION PAPER PATTERN FOR BPT EXAMINATION**

THEORY

COURSES HAVING MAXIMUM MARKS = 100		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
ESSAY TYPE	**02** (***Any TWO*** out of Three)	15
SHORT ESSAY TYPE	**08** (***Any EIGHT*** out of Ten)	5
SHORT ANSWER TYPE	**10**	2
MCQs	**10**	01

COURSES HAVING MAXIMUM MARKS = 80		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
ESSAY TYPE	**2** (***Any TWO*** out of Three)	15
SHORT ESSAY TYPE	**6** (***Any SIX*** out of Eight)	5
SHORT ANSWER TYPE	**5**	2
MCQs	**10**	01

COURSES HAVING SECTION A & SECTION B [40 + 40 = 80 MARKS]		
TYPE OF QUESTION	NUMBER OF	MARKS FOR EACH QUESTION
ESSAY TYPE	SECTION A – **1** (***Any ONE*** out of Two) SECTION B – **1** (***Any ONE*** out of Two)	10
SHORT ESSAY TYPE	SECTION A – **4** (***Any FOUR*** out of Five) SECTION B – **4**	5
SHORT ANSWER TYPE	SECTION A – **5** SECTION B – **5**	2

COURSES HAVING 40 MARKS		
TYPE OF QUESTION	NUMBER OF QUESTIONS	MARKS FOR EACH QUESTION
ESSAY TYPE	01 (***Any ONE*** out of Two)	10
SHORT ESSAY TYPE	04 (***Any FOUR*** out of Five)	5
SHORT ANSWER TYPE	**5**	2

PRACTICAL

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

C. Courses and Distribution of Marks for Non-University Examination

Sl. No.	Courses	Theory	Viva-Voce	Practical	Total
		Max. Marks	Max. Marks	Max. Marks	Max. Marks
1.	Introduction to Healthcare Delivery System in India	40	10	--	50
2.	Basic computer and information science	40	20	40	100
3.	English, Communication and soft skills	40	30	30	100
4.	Kannada	40	30	30	100
5.	Professionalism and values	30	20	-	50
6.	Medical terminology and record keeping	50	30	20	100
7.	Introduction to quality and patient safety (Including Emergency care, BLS, Biomedical waste management, Infection prevention and control, etc.)	40	20	40	100
8.	Medical/ Physiotherapy Law and Ethics	40	10	--	50
9.	Evaluation Methods & Outcome Measures	40	20	40	100
10.	Diagnostic imaging for Physiotherapist	--	20	30	50
11.	Principles of Management	40	10	--	50

Marks qualifying for pass:

a). University examination courses

A candidate is declared to have passed university examination in a course, if she/he secures 50 % of the marks in theory and 50 % in practical separately. For computation of 50 % marks in theory, the marks scored in the internal assessment [theory] shall be added to the University conducted written and viva voce examination and for a pass in practical, the marks scored in University conducted practical examination and internal assessment [practical] shall be added together.

b). Non university examination courses

For a pass in non-university examination courses, a candidate shall secure 40% of the total marks prescribed for the course. The marks obtained shall be sent to the University 15 days prior to the commencement of University examination.

Promotion criteria:

a) University examination courses:

Students are permitted to next year/Semester**only if the number of failed courses is two or less than two in total** and Student must clear these courses before appearing for the final examination of next year. For example

- Failed courses of 1st& 2nd semester is allowed to carry to 3rd and to be cleared before appearing 4th Semester
- Failed courses of 3rd semester is allowed to carry to 4th semester and to be cleared before appearing 5th semester
- Failed courses of 4th semester is allowed to carry to 5th semester and to be cleared before appearing 6th semester
- Failed courses of 5th semester is allowed to carry to 6th semester and to be cleared before appearing 7th semester
- Failed courses of 6th semester is allowed to carry and appear along with 7th semester

- Failed courses of 7th semester is allowed to carry to 8th semester and to be cleared before internship
- Candidate appearing for 8th semester is allowed to carry maximum of 2 courses in total from their previous semesters (6th& 7th) and shall be cleared before appearing internship.

b) Non University examination courses:

- Students shall carry the failed courses and pass before appearing 8th semester University examination.

ONLY AFTER PASSING ALL THE COURSES IN ALL SEMESTERS HE/SHE WILL BE ALLOWED TO UNDERGO INTERNSHIP,

Review of answer papers of failed candidates -

As per the regulations prescribed for review of answer papers, by the University.

Re-admission after break of study -

1. Candidates having a break of study of five years and above from the date of admission and more than two spells of break will not be considered for readmission
2. The five years period of break of study shall be calculated from the date of first admission of the candidate to the course for the subsequent spells of break of study
3. Candidates having break of study shall be considered for re admission only if they are not subjected to any disciplinary action and no charges are pending or contemplated against them.
4. All re admissions of candidates are subjected to the approval of the Vice Chancellor.
5. The candidates having a break of study up to five years shall apply for readmission to the

Registrar of this University. The candidates shall be granted exemption in the courses they have already passed.

Classification of successful candidates -

A successful candidate

1. Who secures 75% and above in the aggregate marks shall be declared to have secured 'FIRST CLASS WITH DISTINCTION'provided he/she passes the whole examination in the "FIRST ATTEMPT".
2. Who secures above 60% and less than 75% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the 'FIRST CLASS, provide he/she passes the whole examination in the "FIRST ATTEMPT'.
3. Who secures above 50% and less than 60% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the 'SECOND CLASS'; and All other successful candidates shall be declared to have PASSED the examinations.

Internship –

There shall be 6 months (26 weeks) of Internship after the final year examination for candidates declared to have passed the examination in all the courses. Internship should be done in a teaching hospital recognized by the University.

No candidate shall be awarded degree certificate without successfully completing six months of Internship and Submitting the Project.

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.

- Physiotherapy OPD (including Pediatrics and OBG wards) 1 month
- Orthopedic wards 1 month
- General Medicine wards (including MICU and CCU) 1 month
- General Surgery wards (including CTS wards, CTS-ICU and Burns) 1 month
- Neurology and Neurosurgery wards (including Neuro. ICU) 1 month
- Community Posting – PHC 1 month

Successful Completion of internship – The student must maintain a logbook. On completion of each posting, the same will have to be certified by the faculty in charge of the posting for both attendance as well as work done. A minimum of two case presentations in each posting is mandatory for the completion. 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.

Vacation –The Head of the Institution may declare 45 days of vacation in an academic year to

the students without a semester break. The period(s) of vacation can be decided by the Head of the Institution.

Maximum duration of the program -

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

Discharge from the program –

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

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

3. "Notwithstanding anything contained in the foregoing, the students who fall in the category clause 1 above and who are in the final year of the respective courses be given one more last and final chance to appear for the University Examination with a condition that if they do not pass the examination even in their last chance, they shall be discharged from the course. The Controller of Examinations will admit such candidate to the University examinations only after their producing an undertaking to this effect."

Migration/transfer of candidates -

The Vice Chancellor shall have the powers to place any migration/transfer he deems fit in the Board of Management and get approval for grant of permission for migration/transfer to candidates undergoing course of study in another University as prescribed by university

SEMESTER- I

HUMAN ANATOMY – I

Course description: The course is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies. Studies are concerned with the topographical and functional anatomy of the limbs and thorax. Particular attention is paid to the muscles, bones, joints, nerves and vessels of the regions.

First Semester (0-6 months)				
Course Code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 101- Human Anatomy- I	60	75	135	9

THEORY (PART I)

Histology + Embryology	20 Hours
Regional Anatomy and its applied anatomy (Part I)	20 Hours
Musculoskeletal Anatomy and its applied anatomy (PART I)	35 Hours

1. Histology
    a. General Histology, study of the basic tissues of the body;
    b. Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone, Muscular tissue, Nerve Tissue – TS & LS, Circulatory system – large sized artery, medium sized artery, large sized vein, lymphoid tissue, Skin and its appendages.

2. Embryology
    a. Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations.
    b. Development of skin, Fascia, blood vessels, lymphatic,
    c. Development of bones, axial and appendicular skeleton and muscles,
    d. Neural tube, brain vessels and spinal cord
    e. Development of brain and brain stem structures
    f. Developmental anomalies

3. Regional Anatomy (PART I)

    a. THORAX
        i. Cardio – Vascular System
            1. Mediastinum: Divisions and contents
            2. Pericardium: Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body – region wise.

ii. Respiratory system
    1. Outline of respiratory passages
    2. Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on broncho-pulmonary segments
    3. Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.
    4. Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

4. Musculo-Skeletal Anatomy (PART I) *[All the topics to be taught in detail]*
    a. Anatomical positions of body, axes, planes, common anatomical terminologies (Groove, tuberosity, trochanters etc)
    b. Connective tissue classification.
    c. Bones- Composition & functions, classification and types according to morphology and development.
    d. Joints-definition-classification, structure of fibrous, cartilaginous joints, blood supply and nerve supply of joints.
    e. Muscles – origin, insertion, nerve supply and actions
    f. Upper Extremity :
        i. Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges.
        ii. Soft parts: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity.
        iii. Joints: Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.
        iv. Arches of hand, skin of the palm and dorsum of hand.
        v. Applied Anatomy including radiological anatomy
    g. Trunk
        i. Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs
        ii. Soft tissue: Pre and Para vertebral muscles, intercostals muscles, Inter-vertebral disc.

5. Applied Anatomy
    a. Applied Anatomy including radiological anatomy to be discussed under each units

PRACTICAL

List of Practical / Demonstrations

Topics

1. Histology-Elementary tissue including surface Anatomy[10Hrs]
2. Embryology-models, charts & X-rays[10Hrs]
3. Thorax including surface anatomy [5Hrs]
4. Upper extremity including surface Anatomy and Osteology [20Hrs]

- Demonstration of the organs in thorax in a cadaver
- Surface making of the lung, pleura, fissures and lobes of lungs, and heart.
- Demonstration of important joint movements.
- Identification of bony prominences on inspection and by palpation especially of Upper extremities.
- Palpation of nerves and arteries.

Recommended Textbooks:

1. Inderbirsingh's textbook of anatomy: 6th Edition, Volume I (General Anatomy, Upper limb, Lower limb). JP Brothers, New Delhi. Rs. 495/-
2. Inderbirsingh's textbook of anatomy: 6th Edition, Volume II (Thorax, Abdomen, Pelvis). JP Brothers, New Delhi. Rs. 495/-
3. SNELL [Richard S], Clinical Anatomy for Medical students : Ed. 5. Little Brown and Company Boston. 1995, p898, $26.50
4. B.D Chaurasia's Human Anatomy – Regional and Applied; Volume I, Volume Ii And Volume Iii.
5. MOORIE [Kieth L], Clinically Oriented Anatomy. Ed.3., Williams and Wilkins, Baltimore, 1992, p917,$30
6. DATTA[A.K], Essentials of human Anatomy: Thorax and Abdomen Ed 2. Vol. I Current Book International, Calcutta 1994, p433, Rs. 200/-
7. DATTA[A.K], Essentials of human Anatomy: Head and Neck Ed 2. Vol. II, Current Book International, Calcutta 1995, p363, Rs. 150/-
8. SINGH [Inderbir], Textbook of Anatomy with colour atlas: Introduction, Osteology, Upper Extremity, Lower Extremity. Vol. I. P Brothers, New Delhi 1996, Rs. 200/-6.
9. SINGH [Inderbir], Textbook of Anatomy with colour Atlas: Thorax and Abdomen. Vol. II. JP Brothers, New Delhi 1996, Rs. 175/-7.
10. SINGH [Inderbir], Textbook of Anatomy with colour Atlas: Head and Neck Central Nervous System. Vol. III. JP Brothers, New Delhi 1996, Rs. 175/-8.
11. SINGH [Inderbir],Human Osteology. JP Brothers, New Delhi 1990,p191, Rs. 50/-

Practical

12. ROMANES [G J], Cunningham manual of practical anatomy: upper and lower limb ed. 15Vol. 1 Oxford Medical Publication, Oxford 1996, P263, Rs. 325/-2.
13. ROMANES [G J], Cunningham manual of practical anatomy : Thorax and abdomen ed15 Vol. II Oxford Medical Publication, Oxford 1996, P298, Rs. 325/-3.
14. 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/-

HUMAN PHYSIOLOGY - I

Course Description: Human Physiology –I, is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body.

First Semester (0-6 months)				
Course code & Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 102- Human Physiology – I	60	30	90	6

THEORY (Part I)

1. General Physiology [2 Hours]
    a. Cell: Morphology. Organelles: their structure and functions
    b. Transport Mechanisms across the cell membrane
    c. Body fluids: Distribution, composition. Tissue fluid – formation.

2. Blood [10 Hours]
    a. Introduction: Composition and functions of blood.
    b. Plasma: Composition, formation, functions. Plasma proteins
    c. RBC: count and its variations. Erythropoiesis- stages, factors regulating. Reticulo-endothelial system (in brief) Haemoglobin - Anemia (in detail), types of Jaundice, Blood indices, PCV, ESR.
    d. WBC: Classification. Morphology, functions, count, its variation of each. Immunity
    e. Platelets: Morphology, functions, count, its variations
    f. Hemostatic mechanisms: Blood coagulation–factors, mechanisms. Their disorders. Anticoagulants.
    g. Blood Groups: Landsteiner's law. Types, significance, determination, Erythroblastosis foetalis.
    h. Blood Transfusion: Cross matching. Indications and complications.
    i. Lymph: Composition, formation, circulation and functions.

3. Nerve Muscle Physiology [15 Hours]
    a. Introduction: Resting membrane potential. Action potential – ionic basis and properties.
    b. Nerve: Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibres. Nerve injury – degeneration and regeneration.
    c. Neuroglia: Types and functions.
    d. Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction: Structure. Neuromuscular transmission, myasthenia gravis. Excitation- Contraction coupling. Rigormortis. Motor unit. Properties of skeletal muscles, Strength- Duration curve,

Length-tension relationship, fatigue, load.Smooth muscle: Structure, types, mechanism of contraction. Plasticity.

4. Cardiovascular System [20 Hours]
    a. Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
    b. Conducting system: Components. Impulse conduction Cardiac Cycle: Definition. Phases of cardiac cycle. Pressure and volume curves. Heart sounds – causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.
    c. Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation. Their variations
    d. Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.
    e. Arterial pulse.
    f. Shock – Definition. Classification–causes and features
    g. Regional Circulation: Coronary, Cerebral and Cutaneous circulation.
    h. Cardiovascular changes during exercise.

5. Respiratory System [15 Hours]
    a. Introduction: Physiological anatomy – Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.
    b. Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration. Chest expansion. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant – Composition, production, functions. RDS
    c. Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume.
    d. Dead Space: Types and their definition.
    e. Pulmonary Circulation. Ventilation-perfusion ratio and its importance.
    f. Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport – Different forms, oxygen-haemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr Effect. Carbon dioxide transport: Different forms, chloride shift.
    g. Regulation of Respirtation: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation.
    h. Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization Hypercapnoea. Asphyxia. Cyanosis – types and features. Dysbarism
    i. Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. periodic breathing – types
    j. Artificial respiration

k. Respiratory changes during exercise.

6. Applied Physiology [8 Hours]

More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interest in Physiotherapy.

a. Pulmonary Functions
    i. Properties of gases, Mechanics of respiration, Diffusion capacity, special features of pulmonary circulation and their application.
    ii. Respiratory adjustments in exercises.
    iii. Artificial respiration
    iv. Breath sounds.

b. Cardio vascular Functions
    i. Blood flow through arteries, arterioles, capillaries, veins and venuoles.
    ii. Circulation of Lymph, Oedema
    iii. Factors affecting cardiac output.
    iv. Circulatory adjustment in exercise and in postural and gravitational changes,
    v. Pathophysiology of fainting and heart failure.

c. Blood functions
    i. Thalassemia Syndrome, Hemophilia, VWF
    ii. Anemia, Leucocytosis
    iii. Bone marrow transplant

PRACTICAL

1. Haematology(To be done by the students) [20 Hours]
    a. Study of Microscope and its uses
    b. Determination of RBC count
    c. Determination of WBC count
    d. Differential leukocyte count
    e. Estimation of hemoglobin
    f. Calculation of blood indices
    g. Determination of blood groups
    h. Determination of bleeding time
    i. Determination of clotting time

2. Clinical Examination [10 Hours]

a. Examination of Radial pulse.
b. Recording of blood pressure
c. Examination of CVS
d. Examination of Respiratory system
e. Examination of Motor System

3. Demonstrations only
    a. Determination of ESR
    b. Determination of PCV

Recommended textbooks:

1. Textbook of medical physiology – Guyton Arthur
2. Concise medical physiology – Chaudhuri Sujit K.
3. Human Physiology – Chatterjee C.C.
4. Textbook of practical Physiology – Ranade.
5. Text of Physiology – A.K.Jain.
6. Basics of Medical physiology- Venkatesh D &Sudhakar H H
7. Maniple Manual of Physiology – Prof. C N Chandrasekhar
8. Review of Medical Physiology – Gaming William F.
8. Physiological basis of Medical practice – Best & Taylor

GENERAL & CLINICAL PSYCHOLOGY

Course Description: Human Psychology involves the study of various behavioral patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups. The study of these courses will help the student to understand their clients while assessment and while planning appropriate treatment methods.

First Semester (0-6 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 103- General and Clinical Psychology	45	15	60	4

THEORY

1. Introduction to Psychology
    a. Schools: Structuralism, functionalism, behaviorism, Psychoanalysis.
    b. Methods: Introspection, observation, inventory and experimental method.

c. Branches: pure psychology and applied psychology
d. Psychology and physiotherapy

2. Growth and Development
    a. Life span: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age).
    b. Heredity and environment: role of heredity and environment in physical and psychological development, "Nature v/s Nurture controversy".

3. Sensation, attention and perception
    a. Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense.
    b. Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants).
    c. Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context).
    d. Illusion and hallucination: different types.

4. Motivation
    a. Motivation cycle (need, drive, incentive, reward).
    b. Classification of motives.
    c. Abraham Maslow's theory of need hierarchy

5. Frustration and conflict
    a. Frustration: sources of frustration.
    b. Conflict: types of conflict.
    c. Management of frustration and conflict

6. Emotions
    a. Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).
    b. Theories of emotion
    c. Stress and management of stress.

7. Intelligence
    a. Theories of intelligence.
    b. Distribution of intelligence.
    c. Assessment of intelligence

8. Thinking
    a. Reasoning: deductive and inductive reasoning
    b. Problem solving: rules in problem solving (algorithm and heuristic)

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

9. Learning
    a. Factors effecting learning.
    b. Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.
    c. The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.

10. Personality
    a. Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach.
    b. Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.
    c. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.

11. Social psychology

    a. Leadership: Different types of leaders. Different theoretical approaches to leadership.
    b. Attitude: development of attitude. Change of attitude.

12. Clinical psychology – Models of training, abnormal behavior assessment, clinical judgement, psychotherapy, self-management methods, physiotherapist patient interaction, aggression, self-imaging, stress management, assertive training, Group therapy, Body awareness, Pediatric, child and geriatric clinical psychology.

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.

INTRODUCTION TO NATIONAL HEALTHCARE DELIVERY SYSTEM IN INDIA

CourseDescription: The course provides the students a basic insight into the main features of Indian health care delivery system and how it compares with the other systems of the world

First Semester (0-6 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Foundation course - Internal examination				
AP01PT 1S1- Introduction to Healthcare Delivery System in India	30	-	30	2

1. Introduction to healthcare delivery system
    a. Healthcare delivery system in India at primary, secondary and tertiary care
    b. Community participation in healthcare delivery system
    c. Health system in developed countries.
    d. Private Sector
    e. National Health Mission
    f. National Health Policy
    g. Issues in Health Care Delivery System in India

2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.

3. Introduction to AYUSH system of medicine
    a. Introduction to Ayurveda.
    b. Yoga and Naturopathy
    c. Unani
    d. Siddha
    e. Homeopathy
    f. Need for integration of various system of medicine
4. Health scenario of India- past, present and future
5. Demography & Vital Statistics-
    a. Demography – its concept
    b. Vital events of life & its impact on demography
    c. Significance and recording of vital statistics
    d. Census & its impact on health policy

6. Epidemiology
    a. Principles of Epidemiology
    b. Natural History of disease

c. Methods of Epidemiological studies
d. Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.

References

GOI. Twelfth five-year plan (2012-2017) social sector, Volume III. Planning commission government of India.p1- 47

MOHFW. Rural health care system in India-the structure and current scenario. Rural health statistics 2011.

Indian Public Health Standards (IPHS) guideline for community health centers, Revised 2012. DGHS, MOHFW, GOI. 1-94

Park K. Park's Textbook of Preventive and Social Medicine. 21st ed. Prem Nagar, Jabalpur, (M.P.), India: M/s BanarsidasBhanot; 2011

BASIC COMPUTERS AND INFORMATION SCIENCE

Course Description: The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation.

First Semester (0-6 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Foundation course - Internal examination				
AP01PT 1S2- Basic computer and information science	15	30	45	3

1. Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.
2. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).
3. Processor and memory: The Central Processing Unit (CPU), main memory.
4. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.
5. Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).
6. Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.
7. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.

8. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.
9. Introduction of Operating System: introduction, operating system concepts, types of operating system.
10. Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.
11. Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.
    a Application of Computers in clinical settings.

PRACTICAL:

1. Practical on fundamentals of computers
    a. Learning to use MS office: MS word, MS PowerPoint, MS Excel.
    b. To install different software.
    c. Data entry efficiency

ENGLISH, COMMUNICATION AND SOFT SKILLS

Course description: This course is intended to teach the students and familiarize with the usage of correct English in all their communications. This will also help the student to overcome their barrier in communication.

First Semester (0-6 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Foundation course - Internal examination				
AP01PT 1S3- English, Communication and soft skills	30	15	45	3

1. Basic Language Skills: Grammar and Usage.
2. Business Communication Skills. With focus on speaking – Conversations, discussions, dialogues, short presentations, pronunciation.
3. Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization.
4. Basic concepts & principles of good communication
5. Special characteristics of health communication
6. Types & process of communication – verbal, non-verbal and written communication. Upward, downward and lateral communication.
7. Therapeutic communication: empathy versus sympathy.
8. Communication methods for teaching and learning.
9. Communication methods for patient education.
10. Barriers of communication & how to overcome.

KANNADA

Course description: This meant for non-Kannada students of this Institution who come from other states & countries. Kannada a self-Instructional course aims at developing. Listening and speaking skills. These lessons are presented in the background of socially familiar contents. Interactivity, Stimulus response is aimed through conversation and narration. The language used in these lessons is standard spoken Kannada.

First Semester (0-6 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Foundation course – Internal examination				
AP01PT 1S4- Kannada	15	15	30	2

1. Introduction: Personal Pronounce, Possessive forms, Interrogative words.
2. Introducing each other. Personal pronouns. Possessive forms (Is it? – Yes, No type interrogative)
3. Possessive forms of nouns dubitative questions, Relative nouns.
4. Enquiring – conversation, qualitative and quantitative adjunctive.
5. Predicative forms, locative case.
6. Dative case basic numerals, use of parts of the speech "for" etc.
7. Ordinal numerals. Plural markers, colour adjectives, defective verbs.
8. Imperative. Permissive and hortative verb "iru" and corresponding negation.
9. Comparative, non-past tense, Instrumental and ablative case. Past tense, 'd', -'t', 'k', 't', 'D' and 'idh'negation, verbal noun.
10. Routine activities of a student. Present continuous tense, Perfect Tenses and negations.
11. Discussion: conditional and negative conditions.

PROFESSIONALISM AND VALUES

Course description-This course is intended to teach the concept of what it means to be a professional and how physiotherapy as a profession is different from other vocations. It will also explain how relevant Professionalism is in terms of the healthcare system and how it affects the overall patient and healthcare environment.

First Semester (0-6 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Foundation course - Internal examination				
AP01PT 1S5-Professionalism and values	15	-	15	1

1. Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality. Core values- Accountability, Altruism, Compassion/ caring, excellence, integrity, professional duties, social responsibility.
2. Personal values- ethical or moral values
3. Attitude and behavior- professional behavior, treating people equally
4. Code of conduct, professional accountability and responsibility, misconduct
5. Differences between professions and importance of team efforts
6. Cultural issues in the healthcare environment
7. Entry level health care practitioner, direct access, autonomy in profession, practitioner of practice and evidence-based practice.

The five roles of the Physiotherapist -

1. The Physiotherapist as Patient/Client manager
    a Evaluation and diagnosis
    b Diagnosis as clinical decision-making
    c Prognosis
    d Discharge planning and discontinuance of care
    e Discontinuance of care
    f Outcomes
    g Clinical decision making
    h Referral relationships
    i Interpersonal relationships
    j Ethical and legal issues
    k Informed consent
    l Managed care and fidelity.

2. The Physiotherapist as Consultant
    a Physiotherapy consultation
    b Building a consulting business
    c The consulting process
    d The skills of a good consultant
    e Trust in the consultant/client relationship
    f Ethical and legal issues in consultation
    g Components of a consulting agreement.

3. The Physiotherapist as Critical Inquirer
    a. History of critical inquiry
    b. Evidence-based practice
    c. Outcomes research
    d. Whose responsibility is research?
    e. Roles of the staff physiotherapist in critical inquiry
    f. Collaboration in clinical research

g. Ethical and legal issues in critical inquiry.

4. The Physiotherapist as Administrator
    a. History of physiotherapy administration
    b. Contemporary physiotherapy administration
    c. Patient/client management
    d. First-line management
    e. Midlevel managers and chief executive officers
    f. Leadership
    g. Ethical and legal issues.

5. The Physiotherapist as Educator
    a. History of physiotherapy education
    b. Contemporary educational roles of the physiotherapist
    c. Teaching opportunities in continuing education
    d. Academic teaching opportunities
    e. Theories of teaching and learning in professional education
    f. Ethical and legal issues in physiotherapy education.

COMMUNITY ORIENTATION AND CLINICAL VISIT

The objective of this section of the foundation course is to sensitize potential learners with essential knowledge; this will lay a sound foundation for their learning across the under-graduate program and across their career. Innovative teaching methods should be used to ensure the attention of a student and make them more receptive such as group activities, interactive fora, role plays, and clinical bed-side demonstrations.

First Semester (0-6 months)					
Sl. No.	**Course Titles**	**Hours**			**Weekly class hours**
		Theory	**Practical**	**Total**	
Foundation course - Internal examination					
1	Community orientation and clinical visit	-	-	45	3

1. The community orientation and clinical visit will include visit to the entire chain of healthcare delivery system -Sub Centre, PHC, CHC, SDH, DH and Medical College, private hospitals, dispensaries and clinics.
2. The student will also be briefed regarding governance at village level including interaction and group discussion with village panchayat and front-line health workers.
3. Clinical visit to their respective professional department within the hospital.

SEMESTER-II

HUMAN ANATOMY – II

(Including Applied Anatomy)

Course description: It is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies. Studies are concerned with the topographical and functional anatomy of the Head and Neck, Abdomen and lower limbs. Particular attention is paid to the muscles, nerves, blood vessels, bones and joints of the regions. The abdomen, pelvis, perineum, head and neck and central nervous system (CNS) are studied with reference to topics of importance to physiotherapists. The study of the CNS includes detailed consideration of the control of motor function.

Second Semester (7 – 12 months)				
Course code&Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 201- Human Anatomy- II (Including Applied Anatomy)	60	90	150	10

THEORY (PART II)

Regional Anatomy and its applied anatomy (Part II)	15 Hours
Musculo-skeletal Anatomy and its applied anatomy	30 Hours
Neuro. Anatomy and its applied anatomy	30 Hours

1. Regional Anatomy - (PART II)

    a. ABDOMEN:
        i. Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.
        ii. Large blood vessels of the gut
        iii. Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gall bladder.

    b. PELVIS:
        i. Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system.

2. Endocrine glands:
    a. Position, shape, size, function, blood supply and nerve supply of the following glands:
        i. Hypothalamus and pituitary gland,
        ii. Thyroid glands,

iii. Parathyroid glands,
iv. Adrenal glands,
v. Pancreatic islets,
vi. Ovaries and testes,
vii. Pineal glands,
viii. Thymus.

3. Musculo-Skeletal Anatomy – (PART II)*[All the topics to be taught in detail]*
    a. Bones- Composition & functions, classification and types according to morphology and development.
    b. Joints- definition-classification, structure of fibrous, cartilaginous joints, blood supply and nerve supply of joints.
    c. Muscles – origin, insertion, nerve supply and actions
    d. Head and Neck:
        i. Osteology: Mandible and bones of the skull.
        ii. Soft parts : Muscles of the face and neck and their nerve and blood supply- extra ocular muscles, triangles of the neck,
        iii. Gross anatomy of eyeball, nose, ears and tongue.
    e. Lower Extremity
        i. Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metartarsals and phalanges.
        ii. Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot.
        iii. Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot.
    f. Pelvis:
        i. Pelvic girdle and muscles of the pelvic floor
        ii. Anterior abdominal wall muscles

4. Neuro. Anatomy
    a. Organization of Central Nervous system - Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system
    b. Cranial nerves
    c. Peripheral nervous system
        i. Peripheral nerve
        ii. Neuromuscular junction
        iii. Sensory end organs
    d. Central Nervous System
        i. Spinal segments and areas
        ii. Brain Stem
        iii. Cerebellum

iv. Inferior colliculi
v. Superior Colliculi
vi. Thalamus
vii. Hypothalams
viii. Corpusstriatm
ix. Cerebralhemisphere
x. Lateral ventricles
xi. Blood supply to brain
xii. Basal Ganglia
xiii. The pyramidalsyste
xiv. Pons,
xv. Medulla,
xvi. Extra pyramidal systems

5. APPLIED ANATOMY
    a. Applied Anatomy including radiological anatomy to be discussed under each units

PRACTICAL

List of Practical / Demonstrations

Topics

1. Pelvic and Lower extremity including surface Anatomy and Osteology [20Hrs]
2. Demonstration of muscles of abdomen pelvic girdle and lower extremity.[20Hrs]
3. Head and Neck, Brain and Spinal cord including surface anatomy
    - Surface marking of the liver, spleen, kidney, cranial nerves and spinal nerves
    - Demonstration of the organs in abdomen in a cadaver
    - Demonstration of joint movements
    - Identification of body prominences on inspection and by palpation especially of Lower extremities.
    - Palpation of nerves and arteries.

Recommended Textbooks:

1. Inderbirsingh's textbook of anatomy: 6th Edition, Volume I (General Anatomy, Upper limb, Lower limb). JP Brothers, New Delhi. Rs. 495/-
2. Inderbirsingh's textbook of anatomy: 6th Edition, Volume II (Thorax, Abdomen, Pelvis). JP Brothers, New Delhi. Rs. 495/-
3. Inderbirsingh's textbook of anatomy: 6th Edition, Volume III (Head and neck, Neuro anatomy, Genetics). JP Brothers, New Delhi. Rs. 495/-
4. SNELL [Richard S], Clinical Anatomy for Medical students: Ed. 5. Little Brown and Company Boston. 1995, p898, $26.50
5. B.D Chaurasia's Human Anatomy – Regional and Applied; Volumes I, II &III.
6. MOORIE [Kieth L], Clinically Oriented Anatomy. Ed.3., Williams and Wilkins, Baltimore, 1992, p917,$30

7. 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],
8. Essentials of human Anatomy:Head and Neck Ed 2. Vol. II, Current Book International, Calcutta 1995, p363, Rs. 150/-
9. SINGH [Inderbir], Textbook of Anatomy with colour atlas: Introduction, Osteology, Upper
10. Extremity, Lower Extremity. Vol. I. P Brothers, New Delhi 1996, Rs. 200/-6.
11. SINGH[Inderbir], Textbook of Anatomy with colour Atlas: Thorax and Abdomen. Vol. II. JPBrothers, New Delhi 1996, Rs. 175/-7.
12. SINGH [Inderbir], Textbook of Anatomy with colour Atlas: Head and Neck Central Nervous System. Vol. III. JP Brothers, New Delhi 1996, Rs. 175/-8.
13. SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990,p191, Rs. 50/-

Practical

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

HUMAN PHYSIOLOGY II

(Including Applied Physiology)

Course Description: The course is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body. The major topics covered include the following: the cell; primary tissue; connective tissue; skin; muscle; nervous tissue; blood; lymphoid tissues; respiration; blood vessels; circulation; cardiac cycle; systemic circulation; motor unit.

Second Semester (7 – 12 months)				
Course code & Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 202-Human Physiology - II (Including Applied Physiology)	60	45	105	7

THEORY - (Part II)

1. Digestive System [5 Hours]
    a. Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system

b. Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication (in brief)
c. Swallowing: Definition. Different stages. Functions.
d. Stomach: Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting.
e. Pancreatic Secretion: Composition, production, function. Regulation.
f. Liver: Functions of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions.
g. Intestine: Succusentericus: Composition, function and regulation of secretion. Intestinal motility and its function and regulation.
h. Mechanism of Defaecation.

2. Renal System [8 Hours]
   a. Introduction: Physiological anatomy. Nephrons – cortical and juxtamedullary. Juxta-glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.
   b. Mechanism of Urine Formation:Glomerular Filtration: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Renal clearance. Insulin clearance. Creatinine clearance.
   c. Tubular Reabsorption: Reabsorption of Na^+, glucose, HCO_3^-, urea and water. Filtered load. Renal tubular transport maximum. Glucose clearance: TmG. Renal threshold for glucose.
   d. Tubular Secretion: Secretion of H^+ and K^+. PAH clearance.
   e. Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretics.
   f. Micturition: Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder.
   g. Acid-Base balance (very brief)
   h. Artificial Kidney: Principle of haemodialysis.
   i. Skin and temperature regulation.

3. Endocrine System [10 Hours]
   a. Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones
   b. Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone. Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus. Physiology of growth and development: hormonal and other influences.
   c. Pituitary-Hypothalamic Relationship.
   d. Thyroid Gland:Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxoedema, Cretinism, Grave's disease.
   e. Parathyroid hormnes: secretory cell, action, regulation of secretion. Disorders: Hypo parathyroidism. Hyperthyroidism.Calcium metabolism and its regulation.

f. Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisoland Androgens. Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome. Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders: Phoechromocytoma.
g. Endocrine Pancreas:Secretory cells, action, regulation of secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.
h. Calcitrol, Thymus and Pineal gland (very brief).
i. Local Hormones (briefly).

4. Reproductive System [5 Hours]
   a. Introduction: Physiological anatomy reproductive organs. Sex determination. Sex differentiation. Disorder
   b. Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis.
      Testosterone: action. Regulation of secretion. Semen.
   c. Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis. Hormones: Oestrogen and progesterone-action. Regulation of secretion. MenstrualCycle: Phases. Ovarian cycle. Uterine cycle. Hormonal basis. Menarche. Menopause. Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods.

5. Special Senses [10 Hours]
   a. Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision.
   b. Visual Pathway and the effects of lesions.
   c. Refractive Errors: myopia, hypermetropia, presbyopia and astigmatism.
   d. Visual Reflexes: Accommodation, Pupillary and Light. Visual acuity and Visual field. Light adaptation. Dark adaptation.Color vision – color blindness. Nyctalopia.
   e. Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for hearing. Audiometry.
   f. Taste: Taste buds. Primary tastes. Gustatory pathway.
   g. Smell: Olfactory membrane. Olfactory pathway.
   h. Vestibular Apparatus: Crista ampullaris and macula. Functions,Disorders.

6. Nervous System [20 Hours]
   a. Introduction: Organisation of CNS – central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties.

b. Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts – Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract – their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereognosis, vibration sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain –slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain. Gate control theory of pain. Tabes dorsalis, sensory ataxia.
c. Motor Mechanism: Motor Cortex. Motor pathway: The descending tracts – pyramidal tracts, extrapyramidal tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.
d. Reflex Action: components, Bell-Magendie law, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes.Stretch reflex– structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone – definition, and properties hypotonic, atone and hypertonic. UMNL and LMNL
e. Spinal cord Lesions: Complete transaction and Hemi section of the spinal cord.
f. Cerebellum: Functions. Cerebella ataxia.
g. Posture and Equilibrium: Postural reflexes – spinal, medullar, midbrain and cerebral reflexes.
h. Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome
i. Reticular Formation and Limbic System: Components and Functions.
j. Basal Ganglia: Structures included and functions. Parkinson's disease.
k. Cerebral Cortex: Lobes. Bradman's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech.
l. EEG: Waves and features. Sleep: REM and NREM sleep.
m. CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.
n. ANS: Features and actions of parasympathetic and sympathetic nervous system.

7. Physiology of Exercise [15 Hours]
    a. Effects of acute and chronic exercise on
        i. O2 transport
        ii. Muscle strength/power/endurance
        iii. B.M.R. /R.Q.
        iv. Hormonal and metabolic effect
        v. Cardiovascular system
        vi. Respiratory system
        vii. Body fluids and electrolyte
    b. Effect of gravity / altitude /acceleration / pressure on physical parameters
    c. Physiology of Age

8. Applied Physiology [7 Hours]

More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interest in Physiotherapy.

a. Muscles and Nervous System Functions
    i. Peripheral nervous system, neuromuscular transmission, Types of nerve fibers.
    ii. Action potential, Strength-duration curve, ECG, EMG, VEP, NCV
    iii. Degeneration and regeneration of nerve, Reactions of enervations.
    iv. Synaptic transmission, Stretch reflex- Mechanism and factors affecting it.
    v. Posture, Balance and Equilibrium/Coordination of voluntary movement
    vi. Voluntary motor action, clones, Rigidity, Discordination,
    vii. Special senses- Vision, taste, hearing, vestibular, Olfaction
    viii. Sympathetic and Parasympathetic regulation, Thermoregulation.
b. Metabolic Functions
    i. Diabetes Mellitus,
    ii. Physiological basis of Peptic Ulcer,
    iii. Jaundice,
    iv. GIT disorders and Dietary fiber,
    v. Thyroid functions,
    vi. Vitamins deficiency,

PRACTICAL

1. Clinical Examination [10 Hours]
    a. Examination of Sensory system
    b. Examination of reflexes
    c. Examination of cranial nerves

2. Amphibian Experiments – Demonstration and Dry charts Explanation. [15 Hours]
    a. Instruments used for frog experiments. Kymograph, heart liver, Muscle trough, stimulator.
    b. Simple muscle curve.
    c. Effect of increasing the strength of the stimuli
    d. Effect of temperature on muscle contraction.
    e. Effect of two successive stimuli.
    f. Effect of Fatigue.
    g. Effect of load on muscle contraction
    h. Genesis of tetanus and clonus.
    i. Velocity of impulse transmission.
    j. Normal cardiogram of amphibian heart.
    k. Properties of Cardiac muscle
    l. Effect of temperature on cardiogram.

3. Recommended Demonstrations [5 Hours]
    a. Spirometry
    b. Artificial Respiration
    c. ECG
    d. Perimetry
    e. Mosso'sErgometry

Recommended textbooks:

1) Textbook of medical physiology – Guyton Arthur
2) Concise medical physiology – Chaudhuri Sujit K.
3) Human Physiology – Chatterjee C.C.
4) Textbook of practical Physiology – Ranade.
5) Text of Physiology – A.K.Jain.
6) Basics of Medical physiology- Venkatesh D &Sudhakar HH
7) Manipal Manual of Physiology – Prof. C N Chandrashekara
8) Review of Medical Physiology – Ganong William F.
9) Physiological basis of Medical practice – Best & Taylor

BIOCHEMISTRY

Second Semester (7 – 12 months)				
Course code &Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 203- Biochemistry	45	15	60	4

1. Introduction to biochemistry and its scope (1 Hour)
2. pH, acids, bases, buffers (1 Hour)
3. Chemistry of Carbohydrates:(3 Hours)
    a. Definition, classification, structures (without isomerism), properties,
    b. Functions and sources of Monosaccharides
    c. Disaccharides,
    d. Oligosaccharides and Polysaccharides.
    e. Glycosaminoglycans (mucopolysaccharides) – General properties, types, tissues distribution functions.

4. Chemistry of Amino acids, Peptides and Proteins (3 Hours)
    a. *Amino acid:* definition, classification, structure, properties and functions
    b. Biologically important peptides

c. *Protein:* definition, classification, structural organization (in brief), denaturation (in brief)
d. Collagen and elastin – structure, function and distribution (in brief)

5. Chemistry of Lipids: (3 Hours)
    a. Definition, classification, properties and functions.
    b. Fatty Acids, triacylglycerol, compound lipids and cholesterol.
    c. Lipoproteins – classification, composition and functions. Normal blood levels of lipids, atherosclerosis, and myocardial infarction

6. Chemistry of Nucleotide and Nucleic acid (2 Hours)
    a. Nucleotide chemistry: Nucleotide structure; functions of free nucleotides.
    b. Nucleic acid (DNA and RNA) chemistry:
    c. Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA.
    d. Structure and functions of tRNA, rRNA, mRNA, snRNA.

7. Enzymes and Clinical Enzymology (3 Hours)
    a. Definition, active site, specificity, cofactor (coenzyme, activator).
    b. Classification with examples.
    c. Factors effecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymes

8. Cells and sub cellular structures (2 Hours)
    a. Introduction, Cell structure, Cell membrane structure and function, various types of transport.
    b. Intracellular organelles and their functions

9. Digestion and Absorption (3 Hours)
    a. General characteristics of digestion and absorption, Digestion and absorption of carbohydrates, proteins and lipids.
    b. Lactose intolerance

10. Intermediary Metabolism (1 Hour)
    a. Introduction to metabolism, High energy compounds

11. Carbohydrate Metabolism (4Hours)
    a. Introduction
    b. Reactions, energetics (if any) and functions of: Glycolysis (Rappaport Leubering cycle included), Citric acid cycle (anaplerosis not included), Glycogen metabolism [Glycogen storage disorders, Type 1 to 4 (Type 1 in detail) included], Gluconeogenesis, Cori cycle.

12. Lipid Metabolism (3 Hours)
    a. Beta oxidation of fatty acids and its energetics
    b. Ketone body formation, utilization and Ketoacidosis
    c. Outlines of synthesis of palmitic acid, triglycerides and lipolysis

13. Regulation of Blood glucose, Hormonal regulation of blood glucose, Diabetes Mellitus. (1 Hour)

14. Amino acid and Protein Metabolism (3 Hours)
    a. Catabolism of amino acids – Introduction, transamination, deamination, fate of ammonia, transport of ammonia, urea cycle
    b. List of biologically important compounds formed from amino acids and their functions - glycine, methionine, phenylalanine and tyrosine

15. Liver function tests, renal function tests (2 Hours)
    a. Liver function tests (exclude bromsulphthalein excretion test, galactose tolerance test and Hippuric acid test)
    b. Renal Function Test – clearance tests (creatinine clearance test)

16. Acid-Base balance (2 Hours)
    a. Buffer systems of the body
    b. Role of lungs and kidneys in acid base balance
    c. Acid base imbalance

17. Water balance (1 Hour)
    a. Water distribution in the body, Body water, water turnover, Regulation of water balance: role of ADH and thirst centre

18. Electrolyte balance (1 Hour)
    a. Osmolarity. Distribution of electrolytes
    b. Electrolyte balance: Role of aldosterone, rennin angiotensin system and ANF 15.

19. Vitamins (7 Hours)
    a. Definition, classification according to solubility,
    b. Individual vitamins – chemistry, sources, coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity

20. Mineral Metabolism (2 Hours)
    a. Introduction and classification of minerals
    b. Sources, RDA, digestion, absorption, transport, excretion, functions, disorder of individual minerals - calcium, phosphate and iron

21. Hormone Action (2 Hours)
    a. Definition, classification, Mechanism of hormone action. Receptors, signal transduction, second messengers and cell function

22. Nutrition (7 Hours)
    a. Introduction, Importance of nutrition, calorific values
    b. Respiratory quotient – Definition, and its significance
    c. Energy requirement of a person –
        i. *Basal metabolic rate*: Definition, Normal values, factor affecting BMR
        ii. *Special dynamic action* of food
        iii. *Physical activities* - Energy expenditure for various activities. Calculation of energy requirement of a person
        iv. Role of carbohydrates in diet (including dietary fibers)
        v. Role of lipids in diet
        vi. Role of proteins in diet (including nitrogen balance and quality of food proteins – biological value, net protein utilization)
        vii. Balanced diet
        viii. Protein energy malnutrition

23. Clinical Biochemistry (1 Hour)
    a. Normal levels in blood and clinical significance of glucose, urea, uric acid, creatinine, calcium, phosphates, pH, bicarbonate and electrolytes (sodium, potassium and chloride).

24. Muscle Contraction (2 Hours)
    a. Contractile elements in muscle, briefly on the process of muscle contraction, Energy for muscle contraction.

Recommended Textbooks

1. MURRAY [ROBERT KK], Harper's Biochemistry Ed 24, Prentice Hall. 1996, p925, Rs. 650/-
2. RAMAKRISHNA [S], PRASANNA [KG], RAJAN [R], Textbook of Medical Biochemistry, Ed 1, orient Langman, Bombay 1980, p717.
3. VASUDEVAN [DM] and SREE KUMARI [S], Textbook of Biochemistry for Medical students, Ed 1, Jaypee Brothers, New Delhi, 1995, p637, Rs.175/-.
4. DAS [Debajyothi], Biochemistry, Ed. 7, Academic Publishers Calcutta, 1992, p648, Rs. 175/-.
5. PRASAD RM, RM's Physiotherapy Textbook Series, Textbook of Biochemistry for Bachelor of Physiotherapy First Edition, RM Publications, Mangalore.
6. LEHININGER [Albert] et. al., Principles of Biochemistry, Ed. 3, LBS Publishers, Delhi, 1993, p1143, Rs.795/-
7. ORTEN [James M] and NEUHAUS [OHO.W]. Human Biochemistry, Ed. 9, Mosby, St. Louis,1975 p994.
8. Strayer [LUBERT], Biochemistry, Ed. 4, WH, Freeman & Co., Ny.1995, p1064, $49.95
9. DEVLIN [Thomas M], Biochemistry with Clinical Correlations, Ed. 4, Willey Libs, Ny 1997, p1186, $30.95.

BASIC PRINCIPLES OF BIOMECHANICS

Course description: Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of musculoskeletal system. Students are taught to understand the various quantitative and qualitative methods of movement. Mechanical principles of various treatment methods are studied. This course prepares the students to understand and apply the basic principles of Biomechanics while learning the courses in semester III namely, Biomechanics and Kinesiology (AP01PT 303) & Exercise therapy I (AP01PT 304). This course also helps the students to understand the concept of ergonomics during therapeutic interventions.

Second Semester (7 – 12 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 204- Basic principles of Biomechanics	45	30	75	5

THEORY

1. Basic Concepts in Biomechanics: Kinematics and Kinetics [14Hours]
    a. Types of Motion
    b. Location of Motion
    c. Direction of Motion
    d. Magnitude of Motion
    e. Definition of Forces
    f. Force of Gravity
    g. Reaction forces
    h. Equilibrium
    i. Objects in Motion
    j. Force of friction
    k. Concurrent force systems
    l. Parallel force system
    m. Work
    n. Moment arm of force
    o. Force components
    p. Equilibrium of levers

2. Joint structure and Function - [10Hours]
    a. Joint design
    b. Materials used in human joints
    c. General properties of connective tissues
    d. Human joint design
    e. Joint function

f. Joint motion
g. General effects of disease, injury and immobilization.

3. Muscle structure and function - [10Hours]
    a. Mobility and stability functions of muscles
    b. Elements of muscle structure
    c. Muscle function
    d. Effects of immobilization, injury and aging

4. Biomechanics of the Thorax and Chest wall - [8 Hours]
    a. General structure and function
    b. Rib cage and the muscles associated with the rib cage
    c. Ventilatory motions: its coordination and integration
    d. Developmental aspects of structure and function
    e. Changes in normal structure and function I relation to pregnancy, scoliosis and COPD

5. The Temporomandibular Joint- [3 Hours]
    a. General features, structure, function and dysfunction

PRACTICAL:

The students shall be taught on demonstrate the following.

1. Equilibrium board, shoulder wheel, shoulder ladder, Bicycle ergometer, Parts of Suspension therapy.
2. Walking Aids/Crutches and staircase.
3. Use of Parallel Bars, CPM, stepper, treadmill, Wall Bars, Tilt Beds, Sprigs, pulleys, overhead pulley system.

Recommended Textbooks:

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 1996,1st Indian Ed 1998, Rs 250.00
3. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997, Rs 300.00

MEDICAL TERMINOLOGIES AND RECORD KEEPING

Course description This course introduces the elements of medical terminology. Emphasis is placed on building familiarity with medical words through knowledge of roots, prefixes, and suffixes. Topics include origin, word building, abbreviations and symbols, terminology related to the human anatomy, reading medical orders and reports, and terminology specific to the student's field of study. Spelling is critical and will be counted when grading tests.

Second Semester (7 – 12 months)				
Course code & Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Foundation course - Internal examination				
AP01PT 2S1- Medical terminology and record keeping	30	-	30	2

1. Derivation of medical terms.
2. Define word roots, prefixes, and suffixes.
3. Conventions for combined morphemes and the formation of plurals.
4. Basic medical terms in health care and physiotherapy.
5. Form medical terms utilizing roots, suffixes, prefixes, and combining roots.
6. Interpret basic medical abbreviations/symbols.
7. Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system.
8. Interpret medical records/reports.
9. Data entry and management on electronic health record system.

SEMESTER-III

PATHOLOGY

Course description: This course follows the basic course of Anatomy, Physiology and Biochemistry and it forms a vital link between preclinical courses and clinical courses. Pathology involves the study of causes and mechanisms of diseases. The knowledge and understanding of Pathology of diseases is essential for a physiotherapist to institute appropriate treatment modalities or suggest preventive measures to the patient.

Third Semester (13-18 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 301- Pathology	45	15	60	4

THEORY

1. General Pathology
    a. Introduction to Pathology [1 Hour]
    b. Cell injuries: [4 Hours]

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.

2. Inflammation and Repair [4 Hours]

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.

3. Circulatory Disturbances [4 Hours]
    a. Hyperemia/Ischemia and Haemorrhage
    b. Edema: Pathogenesis and types.
    c. Chronic venous congestion: Lung, Liver, Spleen, Systemic Pathology
    d. Thrombosis and Embolism: Formation, Fate and Effects.
    e. Infarction: Types, Common sites.
    f. Shock: Pathogenesis, types, morphologic changes.
4. Growth Disturbances and Neoplasia [4 Hours]
    a. Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, Metaplasia, Malformation, agenesis,dysplasia.
    b. Precancerous lesions.

c. Neoplasia: Definition, classification, Biological behavior: Benign and Malignant, Carcinomaand Sarcoma.
d. Malignant Neoplasia: Grades and Stages, Local & Distant spread.
e. Carcinogenesis: Environmental carcinogens, chemical, viral, occupational. Heredity and cellularontogenesis and prevention of cancer.
f. Benign & Malignant epithelial tumoursEg. Squamous papilloma, Squamous cell carcinoma,malignant melanoma. Benign & Malignant mesenchymal tumoursEg: Fibroma, Lipoma,Neurofibroma, Fibrosarcoma, Liposarcoma, Rhabdo-myosarcoma, Teratoma.

5. Nutritional Disorders [1 Hour]
    a. Protein energy malnutrition: Marasmus, Kwashiorkor, andVitamin deficiency disorders, classification with specific examples.

6. Genetic Disorders [1 Hour]
    a. Basic concepts of genetic disorders and some common examples and congenital malformation.
    b. Systemic pathology

7. Hematology [4 Hours]
    a. Constituents of blood and bone marrow, Regulation of hematopoiesis. Anemia: Classification, clinical features & lab diagnosis.
    b. Nutritional anemias: Iron deficiency anemia, Folic acid,Vit. B 12 deficiency anemia including pernicious anemia. Hemolytic Anaemias: Classification and Investigations. Hereditary hemolytic anaemias: Thalessemia, Sickle cell anemia, Spherocytosis and Enzyme deficiencies. Acquired hemolytic anaemiasi. Alloimmune, Autoimmune ii. Drug induced, Microangiopathic Pancytopenia - Aplastic anemia.
    c. Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis. Coagulopathies - (i) Inherited (ii) Acquired with lab diagnosis.
    d. Leukocytic disorders: Leukocytosis, Leukopenis, Leukemoidreaction.
    e. Leukemia: Classification, clinical manifestation, pathology and Diagnosis. Multiple myeloma and disproteinemias.
    f. Blood transfusion; Grouping and cross matching, untoward reactions, transmissible infections including HIV & hepatitis, Blood-components & plasma-pheresis.

8. Respiratory System [3 Hours]
    a. Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs, Occupational lung diseases

9. Cardiovascular Pathology [2 Hours]
    a. Congenital Heart disease: Atrial Septal Defect, Ventricular septal defect, Fallot's tetralogy, PatentDuctus Arteriosus.

b. Endocarditis.
c. Rheumatic Heart disease.
d. Vascular diseases: Atherosclerosis, monckeberg's medial calcification, Aneurysm and Arthritisand Tumours of Blood vessels.
e. Ischemic heart Disease: Myocardial infarction.
f. Hypertension and hypertensive heart Disease.

10. Alimentary tract [3 Hours]
    a. 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.
    b. Tumours and tumour like condition of the small and large Intestine: Polyps, carcinoid, carcinoma,Lymphoma.
    c. Pancreatitis and pancreatic tumours : i) Exocrine, ii) Endocrine
    d. Salivary gland tumours : Mixed, Warthin's

11. Hepato – biliary pathology [2 Hours]
    a. Jaundice Types, aetio-pathogenesis and diagnosis.
    b. Hepatitis: Acute, Chronic, neonatal.
    c. Alcoholic liver disease Cirrhosis: Post necrotic, Alcoholic, Metabolic and Portal hypertension Liver abscesses; Pyogenic, parasitic and Amoebic. Tumors of Liver

12. Lymphatic System [2 Hours]
    a. Diseases of the gall bladder: Cholecystitis, Cholelithiasis, Carcinoma.
    b. Lymphadenitis - Nonspecific and granulomatous
    c. Causes of Lymph Node enlargements. Reactive Hyperplasia, Primary Tumours - Hodgkin's andNonHodgkin’s Lymphomas, Metastatic Tumours.
    d. Causes of Splendid Enlargements.

13. Musculoskeletal System [3 Hours]
    a. Osteomyelitis, acute, chronic, Tuberculous, myeloma
    b. Metabolic diseases: Rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget'sdisease.
    c. Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma.
    d. Arthritis:Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous.

14. Endocrine pathology [3 Hours]
    a. Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis Non-neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, myxedema, Hashimoto's thyroiditis.
    b. Tumours of Thyroid: Adenoma, Carcinoma: Papillary, Follicular, Medullary, Anaplastic.

c. Adrenal diseases: cortical hyperplasia, atrophy, tuberculosis, tumours of cortex and medulla.

15. Neuropathology [3 Hours]
    a. Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess
    b. Tuberculosis, CysticercoidsCNS Tumors, Astrocytoma, Neuroblastoma, Meningioma, Medulloblastoma

16. Dermatopathology [1 Hour]
    a. Skin tumors : Squamos cell carcinoma, Basal cell carcinoma, Melanoma

PRACTICAL

Demonstration of Slides – The students may be demonstrated the common his topathological, hematological and cytological slides and specimens and charts and their interpretations.

Recommended Textbooks

1. Textbook of pathology: Harshmohan
2. General systemic pathology: Churchill Livingstone
3. Textbook of Pathology: Robbins

MICROBIOLOGY

Course description: This course follows the basic courses i.e. Anatomy, Physiology and Biochemistry and it forms a vital link between preclinical courses and clinical courses. Microbiology involves the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections.

Third Semester (13-18 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 302- Microbiology	45	15	60	4

THEORY

1. General Microbiology [5 Hours]
    a. Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate.
    b. Normal flora of the human body.
    c. Routes of infection and spread; endogenous and exogenous infections; source at reservoir ofinfections.

d. Bacterial cell. Morphology limited to recognizing bacteria in clinical samples Shape, motility andarrangement. Structures, which are virulence, associated.
e. Physiology: Essentials of bacterial growth requirements.
f. Sterilization, disinfection and universal precautions in relation to patient care and diseaseprevention. Definition of asepsis, sterilization, disinfection.
g. Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum ofactivity.

2. Immunology [5 Hours]
    a. Basic principles of immunity immunobiology: lymphoid organs and tissues.
    b. Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis.
    c. Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity.
    d. Immunology of hypersensitivity, measuring immune functions. Auto Immunity.

3. Bacteriology [12 Hours]
    a. To be considered under the following headings
        i. Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, collection and transport of samples for laboratory diagnosis, interpretation of laboratory reports
        ii. Staphylococci,
        iii. Streptococci and Pneumococci,
        iv. Mycobacteria: Tuberculosis, M.leprae, atypical mycobacteria,
        v. E coli & Salmonella.
        vi. Vibrois: V. cholerae and other medically important vibrios, Campylobacters and Helicobacters,
        vii. Pseudomonas,
        viii. Bacillus anthracis,
        ix. Sporing and non-sporing anaerobes: Clostridia, Bacteroides and Fusobacteria,

4. General Virology [8 Hours]
    a. General properties: Basic structure and broad classification of viruses.
    b. Pathogenesis and pathology of viral infections.
    c. Immunity and prophylaxis of viral diseases.
    d. Principles of laboratory diagnosis of viral diseases.
    e. List of commonly used antiviral agents.

5. Mycology [3 Hours]
    a. General properties of fungi.
    b. Classification based on disease: superficial, subcutaneous, deep mycosel opportunistic infections including Mycotoxins, systemic mycoses.
    c. General principles of fungal diagnosis, Rapid diagnosis.

d. Method of collection of samples.
e. Antifungal agents.

6. Clinical/Applied Microbiology [12 Hours]
    a. Streptococcal infections: Rheumatic fever and Rheumatic heart disease,
    b. Meningitis.
    c. Tuberculosis,
    d. Pyrexia of unknown origin,
    e. leprosy,
    f. Sexually transmitted diseases,
    g. Poliomyelitis,
    h. Hepatitis,
    i. Acute-respiratory infections,
    j. Central nervous System infections,
    k. Urinary tract infections,
    l. Pelvic inflammatory disease,
    m. Wound infection,
    n. Opportunistic infections,
    o. HIV infection,
    p. Malaria,
    q. Filariasis,
    r. Zoonotic diseases.

PRACTICAL

1. Demonstration of Microscopes and its uses
2. Principles, uses and demonstration of common sterilization equipment
3. Demonstration of common culture media
4. Demonstration of motility by hanging drops method
5. Demonstration of Gram Stain, ZN Stain
6. Demonstration of Serological test: ELISA
7. Demonstration of Fungus

Recommended Textbooks:

Short textbook of Medical Microbiology by Sathish Gupta

1. Textbook of Microbiology by JayaramPanicker
2. Microbiology&Parasitology by Rajeshwar Reddy
3. Textbook of Microbiology by Anantha Narayanan
4. Microbiology by Baveja
5. Textbook of microbiology by Chakraborthy

BIOMECHANICS AND KINESIOLOGY

Course description: Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of musculoskeletal system. Students are taught to understand the various quantitative and qualitative methods of movement. Mechanical principles of various treatment methods are studied. Study of posture and gait are also included. Students will be able to apply the basic principles of Biomechanics (AP01PT 204) learned in semester II. This course also helps students to understand the principles of various physiotherapeutic assessment, diagnosis, exercise prescription, patient safety, mobilization techniques and application of therapy procedures to be taught in following semesters.

Third Semester (13-18 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 303- Biomechanics and kinesiology	75	75	150	10

1. Biomechanics of the vertebral column –[10 hours]
    a. General structure and function
    b. Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region
    c. Muscles of the vertebral column
    d. General effects of injury and aging

2. Biomechanics of the peripheral joints -
    a. The shoulder complex: Structure and components of the shoulder complex and their integrated function [8 hours]
    b. The elbow complex: Structure and function of the elbow joint – humero-ulnar and humeroradial articulations, superior and inferior radio-ulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury. [5 hours]
    c. The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; functional position of the wrist and hand. [8 hours]
    d. The hip complex: structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur: [8 hours]
    e. The knee complex: structure and function of the knee joint: tibia -femoral joint and patella -femoral joints; effects of injury and disease. [10 hours]
    f. The ankle and foot complex.: structure and function of the ankle joint, subtalar joint, talocalcaneonavicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus[9 hours]

3. Analysis of Posture and Gait – Static and dynamic posture, postural control, kinetics and 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. [18 hours]

PRACTICAL- Shall be conducted for various joint movements and analysis of the same.Demonstration may also be given as how to analyze posture and gait. The student shall be taught and demonstrated to analysis for activities of daily living – ADL – (like sitting to standing, throwing, lifting etc.) The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur. The demonstrations may be done on models or skeleton.

Recommended Textbooks:

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 1996,1st Indian Ed 1998, Rs 250.00
3. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997, Rs 300.00

EXERCISE THERAPY I

(Foundation concepts and therapeutic massage)

Course description: In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.

Third Semester (13-18 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 304- Exercise therapy I (Foundation concepts and therapeutic massage)	50	80	130	10

THEORY

1. Foundational Concepts of Exercise Therapy (8 Hours)

a. Therapeutic Exercise: Impact on Physical Function
b. Definition of Therapeutic Exercise
c. Components of Physical Function:
d. Definition of Key Terms
e. Types of Therapeutic Exercise Intervention
f. Exercise Safety
g. Classification of Health Status,
h. Functioning, and Disability—Evolution of Models and Related Terminology
i. Background and Rationale for Classification Systems
j. Models of Functioning and Disability—Past and Present Components of Functioning and
k. Disability Models and Applications in Physical Therapy
l. Patient Management and Clinical Decision-Making: An Interactive Relationship
m. Clinical Decision-Making
n. Evidence-Based Practice
o. A Patient Management Model
p. Strategies for Effective Exercise and Task-Specific Instruction
q. Preparation for Exercise Instruction
r. Concepts of Motor Learning: A Foundation for Exercise and Task-Specific Instruction
s. Adherence to Exercise

2. Methods of Testing (15 Hours)
    a. Functional tests
    b. Measurement of Joint range: ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometry-parts, types, principles, uses., Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints
    c. Tests for neuromuscular efficiency
        i. Electrical tests
        ii. Manual Muscle Testing:
            1. Introduction to MMT, Principles & Aims, Indications &Limitations,Techniques of MMT for group & individual muscles
            2. Techniques of MMT for upper limb /Techniques of MMT for lower limb / Techniques of MMT for spine
        iii. Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf
        iv. Static power Test
        v. Dynamic power Test
        vi. Endurance test
        vii. Speed test
    d. Tests for Co-ordination
    e. Tests for sensation
    f. Pulmonary Function tests

g. Measurement of Limb Length: true limb length, apparent limb length, segmental limb length
h. Measurement of the angle of Pelvic Inclination

3. Relaxation (4 Hours)
    a. Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation, Methods & techniques of relaxation-Principles & uses: General, Local, Jacobson's, Mitchell's, additional methods.

4. Applied Science of Exercise and Techniques (6 Hours)
    a. Range of Motion
        i. Types of ROM Exercises, Indications, Goals, and Limitations of ROM
        ii. Passive ROM, Active and Active-Assistive ROM
        iii. Precautions and Contraindications to ROM Exercises
        iv. Principles and Procedures for Applying ROM Techniques
        v. Examination, Evaluation, and Treatment Planning
        vi. Patient Preparation
        vii. Application of Techniques
        viii. Application of PROM
        ix. Application of AROM
        x. ROM Techniques
        xi. Upper Extremity
        xii. Lower Extremity
        xiii. Cervical Spine
        xiv. Lumbar Spine
        xv. Self-Assisted ROM
        xvi. Self-Assistance
        xvii. Wand (T-Bar) Exercises
        xviii. Wall Climbing
        xix. Overhead Pulleys
        xx. Skate Board/Powder Board
        xxi. Reciprocal Exercise Unit
        xxii. Continuous Passive Motion
        xxiii. Benefits of CPM
        xxiv. General Guidelines for CPM
        xxv. ROM Through Functional Patterns

5. Resistance Exercise for Impaired Muscle Performance (6 Hours)
    a. Active Movements
        i. Types of active movements

ii. Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses
iii. Active Assisted Exercise: principles, techniques, indications, contraindications, effects and uses
iv. Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses

b. Resisted Exercise:
i. Definitions and Guiding Principles
ii. Skeletal Muscle Function and Adaptation to Resistance Exercise
iii. Determinants of Resistance Exercise
iv. Types of Resistance Exercise
v. General Principles of Resistance Training
vi. Precautions for Resistance Exercise
vii. Contraindications to Resistance Exercise
viii. Selected Resistance Training Regime
ix. Equipment for Resistance Training

6. Introduction to Yoga (5 Hours)
   a. Asana – Principles and elements.
   b. Pranayamas – Principles, Methods and Techniques

7. Therapeutic Massage (6 Hours)
   a. History and Classification of Massage Technique
   b. Principles, Indications and Contraindications
   c. Technique of Massage Manipulations
   d. Physiological and Therapeutic Uses of Specific Manipulations

8. Aquatic Exercise (4 Hours)
   a. Background and Principles for Aquatic Exercise
   b. Definition of Aquatic Exercise Goals and Indications for Aquatic Exercise
   c. Precautions and Contraindications to Aquatic Exercise
   d. Properties of Water
   e. Aquatic Temperature and Therapeutic Exercise
   f. Pools for Aquatic Exercise
   g. Special Equipment for Aquatic Exercise
   h. Exercise Interventions Using an Aquatic Environment
      i. Stretching Exercises
      ii. Strengthening Exercises
      iii. Aerobic Conditioning

PRACTICAL

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must be able to evaluate and apply judiciously the different methods of exercise therapy techniques on the patients. They must be able to

1. Demonstrate the technique of measuring ROM using goniometry
2. Demonstrate muscle strength using the principles and technique of MMT
3. Demonstrate the techniques for muscle strengthening based on MMT grading
4. Demonstrate the techniques of massage manipulations
5. Demonstrate to apply the technique of passive movements
6. Demonstrate various techniques of Active movements
7. Demonstrate techniques of strengthening muscles using resisted exercises
8. Demonstrate techniques for measuring limb length and body circumference.
9. Demonstrate breathing exercises
10. Demonstrate techniques of Aquatic exercises

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.

INTRODUCTION TO QUALITY AND PATIENT SAFETY

Course description: This course is to help students understand the basic concepts of quality in health Care and develop skills to implement sustainable quality assurance program in the health system. The course includes teaching NABH guidelines, Basic Life Support, management of biomedical waste, infection control & prevention, antibiotic resistance and disaster management.

Third Semester (13-18 months)				
Course code &Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Foundation course – Internal examination				
AP01PT 3S1-Introduction to quality and patient safety(Including Emergency care, BLS, Biomedical waste management, Infection prevention and control, etc)	20	30	50	3

1. Quality assurance and management - The objective of the course is to help students

understand the basic concepts of quality in health Care and develop skills to implement sustainable quality assurance program in the health system.

a. Concepts of Quality of Care
b. Quality Improvement Approaches
c. Standards and Norms
d. Quality Improvement Tools
e. Introduction to NABH guidelines

2. Basics of emergency care and life support skills - Basic life support (BLS) is the foundation for saving lives following cardiac arrest. Fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an automated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS. The student is also expected to learn about basic emergency care including first aid and triage. Topics to be covered under the course are as follows:
    a. Vital signs and primary assessment
    b. Basic emergency care – first aid and triage
    c. Ventilations including use of bag-valve-masks (BVMs)
    d. Choking, rescue breathing methods
    e. One- and Two-rescuer CPR
    f. Using an AED (Automated external defibrillator).
    g. Managing an emergency including moving a patient

    At the end of this topic, focus should be to teach the students to perform the maneuvers in simulation lab and to test their skills with focus on airways management and chest compressions. At the end of the foundation course, each student should be able to perform and execute/operate on the above-mentioned modalities.

3. Bio medical waste management and environment safety- The aim of this section will be to help prevent harm to workers, property, the environment and the general public. Topics to be covered under the course are as follows:
    a. Definition of Biomedical Waste
    b. Waste minimization
    c. BMW – Segregation, collection, transportation, treatment and disposal (including color coding)
    d. Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
    e. BMW Management & methods of disinfection
    f. Modern technology for handling BMW
    g. Use of Personal protective equipment (PPE)
    h. Monitoring & controlling of cross infection (Protective devices)

4. Infection prevention and control - The objective of this section will be to provide a broad understanding of the core course areas of infection prevention and control and to equip

AHPswith the fundamental skills required to reduce the incidence of hospital acquired infections and improve health outcomes. Concepts taught should include –

a. Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)],
b. Prevention & control of common healthcare associated infections,
c. Components of an effective infection control program, and
d. Guidelines (NABH and JCI) for Hospital Infection Control

5. Antibiotic Resistance-
    a. History of Antibiotics
    b. How Resistance Happens and Spreads
    c. Types of resistance- Intrinsic, Acquired, Passive
    d. Trends in Drug Resistance
    e. Actions to Fight Resistance
    f. Bacterial persistence
    g. Antibiotic sensitivity
    h. Consequences of antibiotic resistance
    i. Antimicrobial Stewardship- Barriers and opportunities, Tools and models in hospitals

6. Disaster preparedness and management- The objective of this section will be to provide knowledge on the principles of on-site disaster management. Concepts to be taught should include-
    a. Fundamentals of emergency management,
    b. Psychological impact management,
    c. Resource management,
    d. Preparedness and risk reduction,
    e. Key response functions (including public health, logistics and governance, recovery, rehabilitation and reconstruction), information management, incident command and institutional mechanisms.

SEMESTER-IV

EXERCISE THERAPY II

Course description: This course is the continuation of Exercise therapy I (Foundation concepts and therapeutic massage) of III semester and intends to teach the students on different types of therapeutic exercise for the benefit of patient in different situations and conditions both in health and disease or disorder.

Fourth Semester (19-24 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 401- Exercise Therapy II	75	105	180	12

1. Proprioceptive Neuromuscular Facilitation (6 Hours)
    a. Definitions & goals
    b. Basic neurophysiologic principles of PNF: Muscular activity,
    c. Diagonals patterns of movement: upper limb, lower limb
    d. Procedure: components of PNFTechniques of facilitation
    e. Mobility: Contract relax, Hold relax, Rhythmic initiation
    f. Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization
    g. Stability: Alternating isometric, rhythmic stabilization
    h. Skill: timing for emphasis, resisted progression
    i. Endurance: slow reversals, agonist reversal

2. Suspension Therapy (5 Hours)
    a. Definition, principles, equipment& accessories, Indications & contraindications, Benefits ofsuspension therapy
    b. Types of suspension therapy: axial, vertical, pendulum
    c. Techniques of suspension therapy for upper limb
    d. Techniques of suspension therapy for lower limb

3. Functional Re-education (6 hours)
    a. Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lower limb and Upperlimb activities.

4. Stretching (5 Hours)
    a. Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching.
5. Manual Therapy & Peripheral Joint Mobilization (8 Hours)

a. Schools of Manual Therapy, Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan
b. Biomechanical basis for mobilization, Effects of joint mobilsation, Indications and contraindications, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.

6. Basics in Manual Therapy & Applications with Clinical reasoning (8 Hours)
    a. Examination of joint integrity
        i. Contractile tissues
        ii. Non contractile tissues
    b. Mobility - assessment of accessory movement & End feel
    c. Assessment of articular & extra-articular soft tissue status
        i. Myofascial assessment
        ii. Acute & Chronic muscle hold
        iii. Tightness
        iv. Pain-original & referred
    d. Basic principles, Indications & Contra-Indications of mobilization skills for joints & soft tissues.
        i. Maitland
        ii. Mulligan
        iii. Mckenzie
        iv. Muscle Energy Technique
        v. Myofascial stretching
        vi. Cyriax
        vii. Neuro Dynamic Testing

7. Balance(8Hours)
    a. Definition Physiology of balance:contributions of sensory systems, processing sensory information,generating motor outputComponents of balance (sensory, musculoskeletal, biomechanical)
    b. Causes of impaired balance, Examination & evaluation of impaired balance, Activities for treating impaired balance: mode, posture, movement, Precautions & contraindications, Types,Balance retraining

8. Co-ordination Exercise (5 Hours)
    a. Anatomy & Physiology of cerebellum with its pathways
    b. Definitions: Co-ordination, Incoordination
    c. Causes for Incoordination,
    d. Test for co-ordination: equilibrium test, non-equilibrium test
    e. Principles of co-ordination exercise
    f. Freckle’s Exercise: uses of Freckle’s exercise, technique of Freckle’s exercise, progression, home exercise.

9. Posture (8 Hours)
    a. Definition,Active and Inactive Postures, Postural Mechanism, Patterns of Posture,
    b. Principles of re-education: corrective methods and techniques, Patient education.
    c. Structure and Function of the Spine
        i. Biomechanical Influences on Postural Alignment
        ii. Stability
    d. Impaired Posture
        i. Aetiology of Pain
        ii. Common Faulty Postures:
        iii. Characteristics and Impairments
    e. Management of Impaired Posture
        i. General Management Guidelines

10. Walking Aids (5 Hours)
    a. Types: Crutches, Canes, Frames; Principles and training with walking aids

11. Individual and Group Exercises (3 Hours)
    a. Advantages and Disadvantages, Organisation of Group exercises, Recreational Activities and Sports
12. Aerobic Exercise (5 Hours)
    a. Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity – Exercise Testing, Determinants of an Exercise Program, The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur with training, Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic training.

PRACTICAL

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must be able to evaluate and apply judiciously the different methods of exercise therapy techniques on the patients. They must be able to

1. Demonstrate the PNF techniques
2. Demonstrate exercises for training co-ordination – Freckle's exercise
3. Demonstrate techniques for functional re-education
4. Demonstrate mobilization of individual joint regions
5. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles
6. Demonstrate the techniques for muscle stretching
7. Assess and evaluate posture and gait
8. Assess and train for using walking aids

Recommended Textbooks

1. Therapeutic exercise by Barbara Bandy
2. Therapeutic exercise by Carolyn Kiser
3. Principles of exercise therapy by Modena Gardiner
4. Practical Exercise therapy by Hollis Margaret
5. Therapeutic exercise by Sydney Latch
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.

ELECTROTHERAPY- I

(Bio Physics, LF and Equipment care)

Course description: In this course the student will learn the Principles, Techniques, and Effects, Indication, Contra-Indication and the dosage parameter for various indications of electro therapeutic modalities in the restoration of physical function. The course will also support the student to understand Electrotherapy-II in IV semester.

Fourth Semester (19-24 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 402- Electrotherapy I (Bio physics, LF & Equipment care)	50	75	125	9

1. Biophysics (15hrs)
   Physical principles
   a. Structure and properties of matter -solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity.
   b. Structure of atom, molecules, elements and compound
   c. Electricity: Definition and types. Therapeutic uses. Basic physics of construction. Working
   d. Importance of currents in treatment.
   e. Static Electricity: Production of electric charge. Characteristic of a charged body.
   f. Characteristics of lines of forces. Potential energy and factors on which it depends. Potential difference and EMF.
   g. Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt
   h. Condensers: Definition, principle, Types- construction and working, capacity & uses.
   i. Magnetism: Definition. Properties of magnets. Electromagnetic induction. Transmission by contact. Magnetic field and magnetic forces. Magnetic effects of an

electric field.

j. Conductors, Insulators, Potential difference, Resistance and intensity
k. Ohm's law and its application to DC and AC currents. Fuse: construction, working and application.
l. Transmission of electrical energy through solids, liquids, gases and vacuum.
m. Rectifying Devices-Thermionic valves, Semiconductors, Transistors, Amplifiers, transducer and Oscillator circuits.
n. Display devices and indicators-analogue and digital.
o. Transformer: Definition, Types, Principle, Construction, Eddy current, working uses
p. Chokes: Principle, Construction and working, Uses

2. Effects of Current Electricity
    a. Chemical effects-ions and electrolytes, ionization, Production of an EMF by chemical actions.
    b. Ionization: Principles, effects of various technique of medical ionization.
    c. Electromagnetic Induction.
    d. Electromagnetic spectrum.

3. Electrical Supply
    a. Brief outline of main supply of electric current
    b. Dangers-short circuit, electric shocks: Micro/ Macro shocks
    c. Precaution-safety devices, earthing, fuses etc.
    d. First aid and initial management of electric shock
    e. Burns: electrical & chemical burns, prevention and management

4. Various agents
    a. Thermal agents: Physical Principles of cold, Superficial and deep heat.
    b. Ultrasound: Physical Principles of Sound
    c. Electro- magnetic Radiation: Physical Principles and their Relevance to Physiotherapy Practice
    d. Electric Currents: Physical Principles and their Relevance to Physiotherapy Practice.

<u>II. Low frequency Currents (35 hrs)</u>

5. Basic types of current
    a. Direct Current: types, physiological &therapeutic effects.
    b. Alternating Current

6. Types of Current used in Therapeutics
    a. Modified D.C
        Faradic Current
        Galvanic Current

b. Modified A.C

Sinusoidal Current

Diadynamic Current.

7. Faradic Current: Definition, Modifications, Techniques of Application of Individual, Muscle and Group Muscle stimulation, Physiological & Therapeutic effects of Faradic Current, Precautions, Indications & Contra-Indications, Dangers.

8. Galvanic Current: Definition, Modifications, Physiological & Therapeutic effects of Galvanic Current, Indications & Contra-Indications, Dangers, Effect of interrupted galvanic current on normally innervated and enervated muscles and partially enervated muscles.

9. Sinusoidal Current &Biodynamic Current in Brief.

10. HVPGS – Parameters & its uses
11. Ionization / Iontophoresis: Techniques of Application of Iontophoresis, Indications, Selection of Current, Commonly used Ions (Drugs) for pain, hyperhydrosis, would healing.
12. Cathodal / Anodal galvanism.
13. Micro Current & Macro Current
14. Types of Electrical Stimulators
    a. NMES- Construction component.
    b. Neuro muscular diagnostic stimulator- construction component.
    c. Components and working Principles
    d. Principles of Application: Electrode tissue interface, Tissue Impedance, Types of Electrode, Size and Placement of Electrode – Waterbath, Unipolar, Bi-polar, Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.

15. Nerve Muscle Physiology: Action Potential, Resting membrane potential, Propagation of Action Potential, Motor unit, synapse, Accommodation, Stimulation of Healthy Muscle, Stimulation of Denervated Muscle, Stimulation for Tissue Repair.

16. TENS: Define TENS, Types of TENS, Conventional TENS, Acupuncture TENS, Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications.

17. Pain: Define Pain, Theories of Pain (Outline only), Pain Gate Control theory in detail.

18. Electro-diagnosis
    a. FG Test
    b. SD Curve: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially Denervated Muscle, Characters of Completely denervated Muscle, Chronaxie&Rheobase.

c. Nerve conduction velocity studies
d. EMG: Construction of EMG equipment.
e. Bio-feedback.

PRACTICAL (75 hrs)

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. Demonstrate the technique for patient evaluation – receiving the patient and positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.
3. Demonstrate placement of electrodes for various electrotherapy modalities
4. Electrical stimulation for the muscles supplied by the peripheral nerves
5. Faradism under Pressure for UL and LL
6. Plotting of SD curve with chronaxie and rheobase
7. Demonstrate FG test
8. Winding up procedure after any electrotherapy treatment method

Equipment care

1. Checking of equipment
2. Arrangement of exercise therapy and electro therapy equipment.
3. Calibration of equipment
4. Purchase, billing, document of equipment.
5. Safety handling of equipment.
6. Research lab equipment maintenance.
7. Stock register, movement register maintenance

Recommended Textbooks

1. **C**laytons 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 MichileCameron
7. Thermal agents by Susan Michlovitz

COMMUNITY MEDICINE

Course Description: This course follows the basic science courses to provide the knowledge about conditions the therapist would encounter in their practice in the community.

Fourth Semester (19-24 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 403- Community Medicine	60	-	60	3

1. Health and Disease: Definitions, Concepts, Dimensions and Indicators of Health, Concept of well-being, Spectrum and Determinants of Health, Concept and natural history of Disease, Concepts of disease control and prevention, Modes of Intervention, Population Medicine, The role of socio-economic and cultural environment in health and disease. [5 hours]

2. Epidemiology, definition and scope. Principles of Epidemiology and Epidemiological methods: Components and Aims, Basic measurements, Methods, Uses of Epidemiology, Infectious disease epidemiology, Dynamics and modes of disease transmission, Host defenses and Immunizing agents, Hazards of Immunization, Disease prevention and control, Disinfection. Screening for Disease: Concept of screening, Aims and Objectives, Uses and types of screening. [7 hours]

3. Epidemiology of communicable disease: Respiratory infections, Intestinal infections, Arthropod-borne infections, Zoonoses, Surface infections, Hospital acquired infections Epidemiology of chronic non-communicable diseases and conditions: Cardio vascular diseases: Coronary heart disease, Hypertension, Stroke, Rheumatic heart disease, Cancer, Diabetes, 0besity, Blindness, Accidents and Injuries. [7 hours]

4. Public health administration- an overview of the health administration set up at Central and state levels. The national health programme-highlighting the role of social, economic and cultural factors in the implementation of the national programmes. Health problems of vulnerable groups- pregnant and lactating women, infants and pre-school children, occupational groups [4 hours]

5. Health programmes in India: Vector borne disease control programme, National leprosy eradication programme, National tuberculosis programme, National AIDS control programme, National programme for control of blindness, Iodine deficiency disorders (IDD) programme, Universal Immunizationprogramme, Reproductive and child health programme, National cancer control programme, and National mental health programme. National diabetes control programme, National family welfare programme, National sanitation and water supply programme, Minimum needs programme [4 hours]

6. Demography and Family Planning: Demographic cycle, Fertility, Family planning-objectives of national family planning programme and family planning methods, A general idea of advantage and disadvantages of the methods. [3 hours]

7. Preventive Medicine in Obstetrics, Paediatrics and Geriatrics: MCH problems, Antenatal, Intranasal and post natal care, Care of children, Child health problems, Rights of child and National policy for children, MCH services and indicators of MCH care, Social welfare programmes for women and children, Preventive medicine and geriatrics. [6 hours]

8. Nutrition and Health: Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition programmes [4 hours]

9. Environment and Health: Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology. [3 hours]

10. Hospital waste management: Sources of hospital waste, Health hazards, Waste management [3 hours]

11. Disaster Management: Natural and manmade disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness [4 hours]

12. Occupational Health: Occupational environment, Occupational hazards, Occupational diseases, Prevention of occupational diseases. Social security and other measures for the protection from occupational hazard accidents and diseases. Details of compensation acts. [4 hours]

13. Mental Health: Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill health, Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health. Role of Physiotherapist in mental health problems such as mental retardation. [3 hours]

14. Health Education: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education [3 hours]

Recommended books:

1. Textbook of Preventive & Social Medicine, Dr. J E Park

PHARMACOLOGY

Course description - This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy.

Fourth Semester (19-24 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT404- Pharmacology	45	-	45	4

1. General Pharmacology –
    a. Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, Adverse effects.

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

3. Cardiovascular Pharmacology –
    a. 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
    b. Antiarrhythmic Drugs
    c. Drugs used in the treatment of vascular disease and tissue ischemia : Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers, Cerebral Ischemia Peripheral Vascular Disease.

4. Neuropharmacology –
    a. Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
    b. Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
    c. Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium
    d. Antipsychotic drugs

5. Disorders of Movement -
    a. Drugs used in Treatment of Parkinson ’s disease

b. Antiepileptic Drugs
c. Spasticity and Skeletal Muscle Relaxants

6. Inflammatory/Immune Diseases -
    a. Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Nonaspirin NSAIDs, drug Interactins with NSAIDs
    b. Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids
    c. Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout
    d. Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematous, Scleroderma, Demyelinating Disease
    e. Respiratory Pharmacology: Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

7. Digestion and Metabolism -
    a. Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemic

8. Geriatrics -
    a. Pharmacology and the geriatric Population: Adverse effects of special concern in the Elderly, Dementia, Postural hypotension.

Recommended Textbooks

1. Lippicott's Pharmacology.
2. Essential of Medical Phramacology by Tripathi
3. Textbook of Medical Pharmacology by Padmajaudaykumar
4. Pharmacology by N.Murugesh
5. Pharmacolgy&Pharmacotherapeutics by Sadoskar.

MEDICAL/ PHYSIOTHERAPY LAW AND ETHICS

Course description: Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals being caught in dilemmas over aspects arising from daily practice.

Medical/ Physiotherapy ethics has developed into a well based discipline which acts as a "bridge" between theoretical bioethics and the bedside. The goal is "to improve the quality of patient care by identifying, analyzing, and attempting to resolve the ethical problems that arise in practice". Doctors are bound by, not just moral obligations, but also by laws and official regulations that form the legal

framework to regulate medical practice. Hence, it is now a universal consensus that legal and ethical considerations are inherent and inseparable parts of good medical practice across the whole spectrum.

Fourth Semester (19-24 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Foundation course – Internal examination				
AP01PT 4S1- Medical/ Physiotherapy Law and Ethics	30	-	30	2

1. Medical ethics versus medical law - Definition - Goal - Scope
2. Introduction to Code of conduct
3. Basic principles of medical ethics – Confidentiality
4. Malpractice and negligence - Rational and irrational drug therapy
5. Autonomy and informed consent - Right of patients
6. Care of the terminally ill- Euthanasia
7. Organ transplantation
8. Medical diagnosis versus physiotherapy diagnosis.
9. Medico legal aspects of medical records – Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects.
10. Professional Indemnity insurance policy
11. Development of standardized protocol to avoid near miss or sentinel events
12. Obtaining an informed consent.
13. Biomedical ethical principles
14. Code of ethics for physiotherapists
15. Ethics documents for physiotherapists
16. Laws affecting physiotherapy practice

SEMESTER-V

CLINICAL ORTHOPEDICS & TRAUMATOLOGY

Course Description: This course follows the basic science courses to provide the knowledge about Orthopaedic conditions the therapist would encounter in their practice.

Fifth Semester (25-30 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 501- Clinical Orthopedics &Traumatology	60	-	60	4

1. Introduction [3 Hours]
    a. Introduction to Orthopaedics. Clinical examination of an Orthopedic patient.
    b. Common investigative procedures.
    c. Radiological and Imaging techniques in Orthopeadics.
    d. Inflammation and repair, Soft tissue healing.

2. Traumatology [3 Hours]
    a. Fracture: definition, types, signs and symptoms.Fracture healing.
    b. Complications of fractures.Conservative and surgical approaches.
    c. Principles of management – reduction (open/closed, immobilization etc).
    d. Sublimation/ dislocations – definition, signs and symptoms, management (conservative and operative).

3. Fractures and Dislocations of Upper Limb [6 Hours]
    a. Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:
        i. Fractures of clavicle and scapula.
        ii. Fractures of greater tuberosity and neck of Humerus.
        iii. Fracture shaft of Humerus.
        iv. Supracondylar fracture of humerus.
        v. Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles.
        vi. Side swipe injury of elbow.
        vii. Both bone fractures of ulna and radius.
        viii. Fracture of forearm – monteggia, galaezzi fracture –dislocation.
        ix. Chauffer’s fracture.Colle’sfracture.
        x. Smith’s fracture.
        xi. Scaphoid fracture.
        xii. Fracture of the metacarpals.
        xiii. Bennett’s fracture.
        xiv. Fracture of the phalanges. (Proximal and middle.)

4. Dislocations of Upper Limb - Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, bankart's) etc. Recurrent dislocation of shoulder. Posterior dislocation of shoulder – mechanism of injury, clinical features and management. Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management.

5. Fracture of Spine [4 Hours]
    a. Fracture of Cervical Spine - Mechanism of injury, clinical feature, complications (quadriplegia); Management- immobilization (collar, cast, brace, traction); Management for stabilization, management of complication (bladder and bowel, quadriplegia). Clay shoveller's fracture. Hangman's fracture. Fracture odontoid. Fracture of atlas.
    b. Fracture of Thoracic and Lumbar Regions - Mechanism of injury, clinical features, and management— conservative and surgical of common fractures around thoracic and lumbar regions. Fracture of coccyx.
    c. Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum.

6. Fractures and Dislocations of Lower Limb [5 Hours]
    a. Fracture of Pelvis and Lower Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:
    b. Fracture of pelvis. Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical.
    c. Fractures of trochanters.
    d. Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical.
    e. Supracondylar fracture of femur.
    f. Fractures of the condyles of femur.
    g. Fracture patella.
    h. Fractures of tibial condyles.
    i. Both bones fracture of tibia and fibula.
    j. Dupuytren's fracture Maisonneuve's fracture.
    k. Pott's fracture – mechanism of injury, management.
    l. Bimalleolar fracture Trimalleolar fracture Fracturecalcaneum – mechanism of injury, complications and management.
    m. Fracture of talus.
    n. Fracture of metatarsals—stress fractures jone's fracture.
    o. Fracture of phalanges.
    p. Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb.
        i. Anterior dislocation of hip. Posterior dislocation of hip. Central dislocation of hip. Dislocation of patella. Recurrent dislocation of patella.

7. Soft Tissue Injuries [3 Hours]
    a. Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis.
    b. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries:
        i. Meniscal injuries of knee. Cruciate injuries of knee. Medial and lateral collateral injuries of knee. Lateral ligament of ankle. Wrist sprains. Strains- quadriceps, hamstrings, calf, biceps, triceps etc. Contusions- quadriceps, gluteal, calf, deltoid etc. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.

8. Hand Injuries [2 Hours]
    a. Mechanism of injury, clinical features, and management of the following - Crush injuries. Flexor and extensor injuries. Burn injuries of hand.

9. Amputations [2 Hours]
    b. Definition, levels of amputation of both lower and upper limbs, indications, complications.

10. Traumatic Spinal Cord Injuries [2 Hours]
    a. Clinical features, complications, medical and surgical management of Paraplegia and Quadriplegia.

11. Deformities [6 Hours]
    a. Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.Congenital Deformities - CTEV. CDH. Torticollis. Scoliosis. Flat foot. Vertical talus. Hand anomalies - syndactyly, polydactyly and ectrodactly. Arthrogryposis multiple congenital (amyoplasiacongenita). Limb deficiencies- Amelia and Phocomelia. Klippel-feil syndrome. Osteogenesis imperfecta (fragile ossium). Cervical Rib.Acquired Deformities - Acquired Torticollis, Scoliosis, Kyphosis, Lordosis, Genu varum, Genu valgum, Genu recurvatum, Coxa vara, Pes cavus, Hallux rigidus, Hallux valgus, Hammertoe, Metatarsalgia.

12. Disease of Bones and Joints [4 Hours]:
    a. Causes, Clinical features, Complications, Management- medical and surgical of the following conditions
        i. Infective conditions: Osteomyelitis (Acute / chronic). Brodie's abscess. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.
        ii. Arthritic conditions: Pyogenic arthritis. Septic arthritis. Syphilytic infection of joints.
        iii. Bone Tumors: classification, clinical features, management - medical and surgical

of the following tumors: Osteoma. Osteosarcoma, Osteochondroma. Enchondroma. Ewing's sarcoma. Gaint cell tumor. Multiple myeloma. Metastatic tumors.

iv. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis.
v. Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia. Osteoporosis.

13. Inflammatory and Degenerative Conditions [4 Hours]:
    a. Causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions:
        i. Osteoarthritis. Rheumatoid arthritis. Ankylosing spondylitis, Gouty arthritis. Psoriatic arthritis. Hemophilic arthritis. Still's disease (juvenile rheumatoid arthritis). Charcot's joints. Connective Tissue Disorders- Systemic Lupus Erythematosis, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

14. Syndromes [3 Hours]:
    a. Causes, Clinical features, complications, management- conservative and surgical of the following:
        i. Cervico brachial syndrome. Thoracic outlet syndrome. Vertebro- basilar syndrome. Scalenus syndrome. Costo clavicular syndrome. Levator scapulae syndrome. Piriformis syndrome.

15. Neuromuscular Disorders [3 hours]:
    a. Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions:
        i. Cerebral palsy, Poliomyelitis, Spinal Dysraphism, Leprosy.

16. Cervical and Lumbar Pathology [3 Hours]:
    a. Causes, clinical feature, patho-physiology, investigations, management-Medical and surgical for the following:

        i. Prolapsed interverbral disc (PID), Spinal Canal Stenosis, Spondylosis (cervical and lumbar) Spondylolysis, Spondylolisthesis, Lumbago/ Lumbosacral strain, Sacralisation, Lumbarisation,Coccydynia,Hemi vertebra.

17. Orthopedic Surgeries [3 Hours]:
    a. Indications, Classification, Types, Principles of management of the following Surgeries:
        i. Arthrodesis, Arthroplasty (partial and total replacement), Osteotomy , External fixators.Spinal stabilization surgeries(Harrington's, Luque's, Steffi plating) etc, Limb re-attachments.

18. Regional Conditions [4 Hours]:

a. Definition, Clinical features and management of the following regional conditions
   i. Shoulder: Periarthritic shoulder (adhesive capsulitis), Rotator cuff tendinitis, Supraspinatus Tendinitis, Infraspinatus Tendinitis, Bicipital Tendinitis, Subacromial Bursitis.
   ii. Elbow: Tennis Elbow, Golfer's Elbow, Olecranon Bursitis (student's elbow). Triceps Tendinitis.
   iii. Wrist and Hand: De Quervain's Tenosynovitis, Ganglion, Trigger Finger/ Thumb, Mallet finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.
   iv. Pelvis and Hip : IT Band Syndrome, Piriformis Syndrome, Trochanteric Bursitis.
   v. Knee: Osteochondritis Dissecans, Prepatellar and Suprapatellar Bursitis, Popliteal Tendinitis,Patellar Tendinitis, Chondromalacia Patella, Plica Syndrome, Fat Pad Syndrome (Hoffa's syndrome).
   vi. Ankle and Foot: Ankle Sprains,Plantar Fasciitis / Calcaneal Spur, Tarsal Tunnel Syndrome,Achilles Tendinitis, Metatarsalgia, Morton's Neuroma.

Books Recommended:

1. Outline of Fractures, John Crawford Adams.
2. Outline of Orthopedics.,John Crawford Adams.
3. Textbook of Orthopedics.Maheswari.
4. Apley's Orthopedics.
5. Textbook of Orthopedics and Traumatology, M.N.Natarajan

GENERAL SURGERY INCLUDING BURNS AND PLASTIC SURGERY (Section-A) & OBSTETRICS AND GYNECOLOGY(Section-B)

Course description: This course follows the basic science courses to provide the knowledge about relevant aspects of general surgery. The student will have a general understanding of the surgical conditions the therapist would encounter in their practice

Fifth Semester (25-30 months)				
Course code &Titles	Hours			**Weekly class hours**
	Theory	Practical	Total	
AP01PT 502-General Surgery including burns and plastic surgery **AP01PT 502-**Obstetrics and Gynecology	60	-	60	5

GENERAL SURGERY INCLUDING BURNS AND PLASTIC SURGERY
(Section-A)

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. Hemostasis – components, hemostatic 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, Pnuemothorax, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal 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.

5. Disorders of the Chest Wall, Lung and Mediastinum

6. Thoracic surgeries: **Thoracotomy** – Definition, Types of Incisions with emphasis to the site of insision, muscles cut and complications. **Lung surgeries:** Pnumonectomy, Lobectomy, segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung. **Cardiac surgeries –** An overview of the Cardio-PulmonaryBypass Machine – Extracardiac Operations, Closed Heart surgery, Open Heart surgery. Transplant Surgery – Heart, Lung and Kidney – Indications, Physiological changes and Complications.

7. Diseases of the Arteries and Veins: Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases : Arteriosclerosis, Aneurysm, Berger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.

8. Definition, Indication, Incision, Physiological changes and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendicectomy Mastectomy, Neprectomy, Prostectomy.

9. 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.

10. 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.

11. Ophthalmology: Ophthalmologic surgical conditions, refraction's, conjunctivitis, glaucoma, corneal ulcer, iritis, cataract, retinitis, detachment of retina, defects of extra-ocular muscles-surgical management.

OBSTETRICS AND GYNECOLOGY
(Section-B)

THEORY

1. Anatomy and physiology of the female reproductive organs. Puberty dynamics
2. Physiology of menstrual cycle –
    a. ovulation cycle,
    b. uterine cycle,
    c. Cx cycle,
    d. duration,
    e. amount
    f. Hormonal regulation of menstruation,
3. Hormonal disorders of females-obesity and female hormones
4. Pregnancy
    a. Diagnosis of pregnancy
    b. Abortion
    c. Physiological changes during pregnancy
    d. Importance of antenatal care exercise
    e. High risk pregnancy, prenatal common complications – investigation and management
    f. Musculoskeletal disorders during pregnancy
    g. Multiple childbirth
    h. Normal labor

5. Childbirth complications, investigation and management
6. Normal puerperium, lactation and importance of post-natal exercises
7. Family planning.
8. Medical termination of pregnancy
9. Infection of female genital tract including sexually transmitted diseases, low backache

10. Prolapse of uterus and vagina
11. Principle of common gynaecological operations – hysterectomy, D&C, D&E, Pop smear
12. Menopause: Its effect on emotions and musculoskeletal system
13. Urogenital dysfunction – pre and post-natal condition
14. Sterility: Pathophysiology, investigations, management, Malnutrition and deficiencies in females.
15. Surgical procedures involving childbirth.
    a. Definition, Indications and Management of the following surgical procedures – pelvic repair, caesarian section, nephrectomy, Hysterosalphyngography, Dilatation and Curettage, Laproscopy, Colposopy, Hysterectomy.
16. Carcinoma of female reproductive organs – surgical management in brief Mastectomy – Simple, radical. Hysterectomy.
17. Incontinence – Types, Causes, Assessment and Management.

Recommended books:

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, Textbook of Heart, Chest Vascular Disease for physiotherapists, JP Bros.

GENERAL MEDICINE INCLUDING PAEDIATRICS AND PSYCHIATRY

Course Description: This course follows the basic science courses to provide the knowledge about relevant aspects of general medicine. The student will have a general understanding of the diseases the therapist would encounter in their practice.

Fifth Semester (25-30 months)				
Course code& Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 504- General Medicine, Paediatrics& psychiatry	60	-	60	5

1. Infection: Effects of Infection on the body – Pathology – source and spread of infection – vaccinations – generalized infections – rashes and infection – food poisoning and gastroenteritis - 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 disorders: 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; Anemia – signs and symptoms – types and management ; Hemophilia - Cause – clinical features severity of disease – management – complications due to repeated hemorrhages – complications due to therapy.

6. Diseases of the digestive system : Clinical manifestations of gastrointestinal disease – Etiology, clinical features, diagnosis, complications and treatment of the following conditions : Reflux Oesophagitis, Achlasia 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, Cholycystitis.

7. 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.

8. 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.

9. Psychiatric Disorders: Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry. Modalities of psychiatric treatment, Psychiatric illness and physiotherapy, Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses -Anxiety neurosis, Depression, Obsessive compulsive neurosis, Psychosis, Maniac-depressive psychosis, Post-traumatic stress disorder, Psychosomatic reactions: Stress and Health, theories of Stress – Illness.

Etio-pathogenesis, manifestations, and management of psychiatric illness

a. Drug dependence and alcoholism,
b. Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue,
c. Personality disorders
d. Child psychiatry - manifestations, and management of childhood disorders -attention deficit syndrome and behavioral disorders.
e. Geriatric psychiatry.

Recommended books:

1. Davidson's Principles and Practice of Medicine
2. Harrison's Internal Medicine
3. Braunwald Text of Cardiology
4. Textbook of Cardiology by Hurst

ELECTRO THERAPY II

Course description: In this course the students will learn the Principles, Techniques, Physiological and therapeutic effects, Indications & contraindications of the modalities, safety measures, dangers and construction of the Medium and High frequency equipment's usedin physiotherapy.

Fifth Semester (25-30 months)				
Course code &Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 505- Electro therapy II (MF, HF, and Equipment care)	40	70	110	8

1. Medium Frequency
    a. Interferential Therapy: Define IFT, Principle of Production of IFT, Static Interference System, Dynamic Interference system, Dosage Parameters for IFT, Electrode placement in IFT, Physiological & Therapeutic effects, Indications & Contraindications.
    b. Russian Current
    c. Rebox type Current

2. Thermo & Actinotherapy (High Frequency Currents)
    a. Electro Magnetic Spectrum.

    b. SWD: Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes,

Tuning, Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters.

c. Pulsed Electro Magnetic Energy: Principles, Production & Parameters of PEME, Uses of PEME.

d. Microwave Diathermy: Define Microwave, Wave length & Frequency, Production of MW, Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD. [2 Hours]

e. Ultrasound: Define Ultrasound, Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous& Pulsed mode, Intensity, US Fields: Near field, Far field, Half value distance, Attenuation, Coupling Media, Thermal effects, Non-thermal effects, Principles & Application of US: Direct contact, Water bag, Water bath, Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications, Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, commonly used drugs, Uses. Dosages of US. [8 Hours]

f. IRR: Define IRR,wavelength& parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication. [2 Hours]

g. UVR: Define UVR, Types of UVR,UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, Fluorescent tube, Theraktin tunnel, PUVA apparatus. Physiological & Therapeutic effects. Sensitizers & Filters. Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers. Dosages for different therapeutic effects, Distance in UVR lamp [8 Hours]

h. LASER: Define LASER. Types of LASER. Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER. Energy density & power density [8 Hours]

3. Superficial heating modalities
   a. Wax Therapy: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers.

   b. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.

   c. Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications.

d. Cyclotherm: Principles of production, Therapeutic uses, Indications & Contraindications.

e. Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications.

f. Whirlpool Bath: Construction, Method of Application, Therapeutic Uses, Indications & Contraindications.

g. Magnetic Stimulation, Principles, Therapeutic uses, Indications & contraindication.

h. Cryotherapy: Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, Methods of application with dosages.

PRACTICAL

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. Demonstrate the technique for patient evaluation – receiving the patient and positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.
3. Demonstrate placement of electrodes for various electrotherapy modalities
4. Application of Ultrasound for different regions-various methods of application
5. Demonstrate treatment techniques using SWD, IRR and Microwave diathermy
6. Demonstrate the technique of UVR exposure for various conditions – calculation of test dose
7. Demonstrate treatment method using IFT for various regions
8. Calculation of dosage and technique of application of LASER
9. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath, wax therapy
10. Demonstrate the treatment method using whirl pool bath
11. Winding up procedure after any electrotherapy treatment method

Equipment care -

1. Checking of equipment
2. Arrangement of exercise therapy and electro therapy equipment.
3. Calibration of equipment
4. Purchase, billing, document of equipment.
5. Safety handling of equipment.
6. Research lab equipment maintenance.
7. Stock register, movement register maintenance

Recommended Textbooks

1. **C**laytons 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

EVALUATION METHODS AND OUTCOME MEASURES

Fifth Semester (25-30 months)				
Course code &Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Not for university examination				
AP01PT 5S1- Evaluation Methods & Outcome Measures	20	25	45	3

Methods to assess individual and collective outcomes of patients/clients with disorders of the musculoskeletal, neuromuscular, cardiovascular-pulmonary and integumentary systems using valid and reliable measures that take into account the setting in which patients/clients receive services, the variables of cultural competence, and the effect of societal factors.

DIAGNOSTIC IMAGING FOR PHYSIOTHERAPIST

Course description- This course covers the study of common diagnostic and therapeutic imaging tests. The course will cover that how X-Ray, CT, MRI, Ultrasound and Other Medical Images are created and how they help the health professionals to save lives.

Fifth Semester (25-30 months)				
Course code & Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Not for university examination				
AP01PT 5S2 - Diagnostic imaging for Physiotherapist	15	-	15	1

1. Image interpretation
    a. History
    b. A New Kind of Ray
    c. How a Medical Image Helps

d. What Imaging Studies Reveal
e. Radiography(x-rays)
f. Fluoroscopy
g. Computed Tomography (CT)
h. Magnetic Resonance Imaging (MRI)
i. Ultrasound
j. Endoscopy.

2. Radiography and mammography
    a. Equipment components
    b. Procedures for Radiography & Mammography
    c. Benefits versus Risks and Costs
    d. Indications and contraindications.

3. Fluoroscopy
    a. What is Fluoroscopy?
    b. Equipment used for fluoroscopy
    c. Indications and Contra indications
    d. How it helps in diagnosis
    e. The Findings in Fluoroscopy
    f. Benefits versus Risks and Costs.

4. Computed Tomography (CT)
    a. What is Computed Tomography?
    b. Equipment used for Computed Tomography
    c. Indications and Contra indications
    d. How it helps in diagnosis
    e. The Findings in Computed Tomography
    f. Benefits versus Risks and Costs.

5. Magnetic Resonance Imaging (MRI)
    a. What is MRI?
    b. Equipment used for MRI
    c. Indications and Contra indications
    d. How it helps in diagnosis
    e. The Findings in MRI
    f. Benefits versus Risks and Costs
    g. Functional MRI.

6. Ultrasound
    a. What is Ultrasound?
    b. Equipment used for Ultrasound
    c. Indications and Contra indications

d. How it helps in diagnosis
e. The Findings in Ultrasound
f. Benefits versus Risks and Costs.

7. Endoscopy
    a. What is Endoscopy?
    b. Equipment used for Endoscopy
    c. Indications and Contra indications
    d. How it helps in diagnosis
    e. The Findings in Endoscopy
    f. Benefits versus Risks and Costs.

8. Nuclear medicine
    a. What is Nuclear Medicine?
    b. Equipment used for Nuclear Medicine
    c. Indications and Contra indications
    d. How it helps in diagnosis.
    e. Benefits versus Risks and Costs.

SEMESTER-VI

PHYSIOTHERAPY IN ORTHOPEDICS & SPORTS

Course Description: The course in orthopaedics and sports physiotherapy provides students with the fundamental principles for Physiotherapy diagnosis and treatment of the diseases and injuries of the musculoskeletal system that they will need during their foundation training. Students will be able to apply the knowledge gain from the previous courses.

Sixth Semester (31-36 months)				
Course code & Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 601- Physiotherapy in Orthopedics & sports	60	75	135	8

1. Physiotherapy Assessment(PT) for Orthopedic conditions – [4 Hours]
    a. 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.
    b. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait.
    c. On palpation- tenderness-grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances.
    d. 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.
    e. Prescription of home program. Documentation of case records, and follow up.

2. Deformities: [2 Hours]

    a. 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.

3. Fractures – [2 Hours]

    a. Review on 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.

b. Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases -short &long-term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.

c. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc.

4. Specific fractures and dislocations: [4 Hours]

   a. PT assessment and management of upper limb fractures and dislocations.

   b. PT assessment and management of lower limb fractures and dislocations including pelvis.

   c. PT assessment and management spinal fractures.

5. Selection and application of physiotherapeutic techniques, maneuver's, modalities for preventive, curative and rehabilitative means in all conditions. [2 Hours]

6. Principles of various schools of thought in manual therapy. (Briefly Maitland, Mulligan, and Mckenzie). [3 Hours]

7. Degenerative and Inflammatory conditions: [2 Hours]

   a. Definition, signs and symptoms, clinical features, path physiology, 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, Periarthritic shoulder.

8. Infective conditions: [2 Hours]

   a. 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. [2 Hours]

10. Cerebral palsy: [1 Hours]

    a. 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.

11. Poliomyelitis: [1Hours]

    a. 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.

12. Leprosy: [1 Hours]

    a. 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.

13. Amputations: [3Hours]

    a. 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.

14. Introduction to Bio-Engineering; [6 Hours]

    a. 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.

15. Spinal conditions: [3 Hours]

    a. 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, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.

16. Effects of spinal traction, types of traction, modes of application, indications for spinaltraction, contraindications, precautions, limitations of traction. [1 Hours]

17. Osteoporosis- causes, predisposing factors, investigations and treatment. [1 Hour]

18. Orthopedic surgeries: [4 Hours]

a. 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, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.

19. Shoulder joint : [2 Hours]

    a. 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.

20. Elbow and forearm: [1 Hours]

    a. Excision of radial head - Post operative PT management. Total elbow arthroplasty-Post operative PT management.

21. Wrist and Hand: [2 Hours]

    a. Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations - Post operative PT management.

22. Hip: Joint surgeries [2 Hours]

    a. Hemi and total hip replacement - Post operative PT management

    b. Tendonitis and bursitis. - Management.

23. Knee: [3 Hours]

    a. 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.

24. Ankle and foot: Ankle instability. Ligamentous tears- Post operative management. [1 Hour]

25. Sports Physiotherapy : [5 Hours]

    a. 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 Ligamen.tous 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. Dequervain's tenosynovitis. Trigger and Mallet finger. Plantar fasciitis. Wrist sprains.

26. Applied Yoga in Orthopaedic conditions – Rationale of Yoga and Physiotherapy, Therapeutic benefits of Yoga.

PRACTICAL

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.
3. Detailed Orthopaedic Physical Assessment of Individual joints.

Recommended books:

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
7. Orthopaedic Physical Assessments – David J. Magee

PHYSIOTHERAPY IN GENERAL MEDICINE AND GENERAL SURGERY

Course Description

The course provides students with the fundamental principles for Physiotherapy diagnosis and treatment of General Medical & Surgical conditions.

Sixth Semester (31-36 months)				
Course code & Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 602-Physiotherapy In General Medicine and General surgery	60	75	135	8

THEORY

1. Physiotherapy in mother and childcare – ante and post-natal management, early intervention and stimulation therapy in child care (movement therapy)
2. Geriatrics – handling of old patients and their problems.
3. Complication common to all operations
4. Abdominal incisions.
5. Physiotherapy in pre and post-operative stages.
6. Operations on upper G.I.T.- oesophagus, stomach, duodenum
7. Operations on large and small intestine – Appendisectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, hernioraphy, hernioplasty.
8. Physiotherapy in dentistry
9. Burns and its treatment – physiotherapy in burns, skin grafts, and reconstructive surgeries.
10. Management of wound ulcers- Care of ulcers and wounds - Care of surgical scars- U.V.R and other electro therapeutics for healing of wounds, prevention of Hyper-granulated Scars Keloids, Electrotherapeutics measures for relief of pain during mobilization of scars tissues.
11. Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases.
12. Physiotherapy in dermatology -Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhydrosis. Massage maneuvers for cosmetic purpose of skin; use of specific oil as medium; Care of anesthetic hand and foot; Evaluation, planning and management of leprosy-prescription, fitting and training with prosthetic and orthotic devices.
13. ENT – sinusitis, non-suppurative and chronic suppurative otitis media, osteosclerosis, labrynthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeo – laryngectomy, facial palsy.

14. Applied yoga inGeneral Medicine & General Surgery conditions – Rationale of Yoga and Physiotherapy, Therapeutic benefits of Yoga.

Recommended books:

1. Tidy's physiotherapy.
2. Cash’s Textbook of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treament – O’Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley
6. Essentials of Cardiopulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardiao pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash’s Textbook of General Medicine and Surgical conditions for Physiotherapists.
10. Physical Therapy for the Cancer patient by M.C Garvey

CLINICAL NEUROLOGY & NEUROSURGERY

Course Description: This course follows the basic science courses to provide the knowledge about relevant aspects of neurology & neurosurgery. The student will have a general understanding of the diseases the therapist would encounter in their practice.

Sixth Semester (31-36 months)				
Course code& Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 603- Clinical Neurology & Neurosurgery	60	-	60	4

1. Disorders of function in the context of Pathophysiology, Anatomy in Neurology and Cortical Mapping.

2. Classification of neurological involvement depending on level of lesion.

3. Neurological assessment: Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.

4. Investigations: principles, methods, views, normal/abnormal values/features, types of following investigative procedures- skull x-ray, CT, MRI, evoked potentials, lumbar puncture, CSF examination, EMG, NCV.

5. Neuro-ophthalmology: Assessment of visual function – acuity, field, colour vision, Pupillary reflex, accommodation reflex, abnormalities of optic disc, disorders of optic nerve, tract, radiation, occipital pole, disorders of higher visual processing, disorders of pupil, disorders of eye movements, central disorders of eye movement.

6. Deafness, vertigo, and imbalance: Physiology of hearing, disorders of hearing, examination & investigations of hearing, tests of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.

7. Lower cranial nerve paralysis – Etiology, clinical features, investigations, and management of following disorders - lesions in trigeminal nerve, trigeminal neuralgia, trigeminal sensory neuropathy, lesions in facial nerve, facial palsy, bell's palsy, hemi facial spasm, Glossopharangial neuralgia, lesions of Vagus nerve, lesions of spinal accessory nerve, lesions of hypoglossal nerve. Dysphagia – swallowing mechanisms, causes of dysphagia, symptoms, examination, and management of dysphagia.

8. Cerebro-vascular diseases: Define stroke, TIA, RIA, stroke in evolution, multi infarct dementia and Lacunar infarct. Classification of stroke – Ischemic, hemorrhagic, venous infarcts. Risk factors, cause of ischemic stroke, causes of hemorrhagic stroke. Classification of hemorrhagic stroke, classification of stroke based on symptoms, stroke syndrome, investigations, differential diagnosis, medical and surgical management.

9. Head injury: Etiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications.

10. Higher cortical, neuro psychological and neurobehavioral disorders: Causes of blackouts, physiological nature of Epilepsy, classification, clinical features, investigations, medical& surgical management of following disorders – Non-epileptic attacks of childhood, Epilepsy in childhood, Seizers, and Epilepsy syndromes in adult. Classification and clinical features of Dyssomnias, Parasomnias, Dementia, Obsessive-compulsive disorders. Neural basis of consciousness, causes &investigations of Coma, criteria for diagnosis of Brain death. Etiology, pathophysilogy, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Perceptual disorders and Speech disorders.

11. Movement disorders: Definition, etiology, risk factors, pathophysilogy, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Parkinson's disease, Dystonia, Chorea, Ballism, Athedosis, Tics, Myoclonus and Wilson's disease.

12. Cerebellar and coordination disorders: Etiology, pathophysilogy, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Congenital ataxia, Friedreich's ataxia, Ataxia talengiectasia, Metabolic ataxia, Hereditary cerebellar ataxia, Tabes dorsalis and Syphilis.

13. Spinal cord disorders: Functions of tracts, definition, etiology, risk factors, pathophysilogy, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Spinal cord injury, Compression by IVD prolapse, Spinal epidural abscess, Transverse myelitis, Viral myelitis, Syringomyelia, Spina bifida, Sub acute combined degeneration of the cord, Hereditary spastic paraplegia, Radiation myelopathy, Progressive encephalomyelitis, Conus medullaris syndrome, Bladder & bowel dysfunction, and Sarcodosis.

14. Brain tumors and spinal tumors: Classification, clinical features, investigations, medical and surgical management.

15. Infections of brain and spinal cord: Etiology, pathophysilogy, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Meningitis, Encephalitis, Poliomyelitis and Post-polio syndrome. Complications of systemic infections on nervous system – Septic encephalopathy, AIDS, Rheumatic fever, Brucellosis, Tetanus, and Pertussis.

16. Motor neuron diseases: - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications of following disorders - Amyotrophic lateral sclerosis, Spinal muscular atrophy, Hereditary bulbar palsy, Neuromyotonia and Post-irradiation lumbosacral polyradiculopathy.

17. Multiple sclerosis - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications.

18. Disorders of neuromuscular junction – Etiology, classification, signs & symptoms, investigations, management, of following disorders Myasthenia gravis, Eaton-Lambert syndrome, and Botulism.

19. Muscle diseases: Classification, investigations, imaging methods, Muscle biopsy, management of muscle diseases, genetic counselling. Classification, etiology, signs & symptoms of following disorders – Muscular dystrophy, Myotonic dystrophy, myopathy, Non-dystrophic myotonia.

20. Polyneuropathy – Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomic neuropathies, Amyloid neuropathy, acute idiopathicPolyneuropathies. Guillain-Barre syndrome – Causes, clinical features, management of GBS, Chronic Idiopathic Polyneuropathies, diagnosis of polyneuropathy, nerve biopsy.

21. Focal peripheral neuropathy: Clinical diagnosis of focal neuropathy, neurotmesis, Axonotmesis, Neuropraxia. Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – RSD, Nerve tumors, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & Intercostal 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, Pudental nerve palsy.

22. Paediatric neurology: Neural development, Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders - Cerebral palsy, Hydrocephalus, Arnold-chiari malformation, Basilar impression, Klippel-Feil syndrome, Achondroplacia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.

23. Toxic, metabolic and environmental disorders: Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – Encephalopathy, Alcohol toxicity, Recreational drug abuse, Toxic gases & Asphyxia, Therapeutic & diagnostic agent toxicity, Metal toxicity, Pesticide poisoning, Environmental & physical insults, Pant & Fungal poisoning, Animal poisons, & Complications of organ transplantation.

24. Introduction, Indications and Complications of following Neuro surgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery,

Endarterectomy, Embolization, Pituitary surgery, Ablative surgery - Thalamotomy and Pallidotomy, Coiling of aneurysm, Clipping of aneurysm, and Neural implantation.

Recommended books:

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

SOCIOLOGY

Course Description: This course will introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India will be studied.

Sixth Semester (31-36 months)				
Course code &Title	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 604- Sociology	45	-	45	3

THEORY

1. Introduction:
   a. Meaning- Definition and scope of sociology
   b. Its relation to Anthropology, Psychology, Social Psychology.
   c. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.
   d. Importance of its study with special reference to Health Care Professionals.

2. Social Factors in Health and disease situations:
   a. Meaning of social factors
   b. Role of social factors in health and illness

3. Socialization:
   a. Meaning and nature of socialization.
   b. Primary, Secondary and Anticipatory socialization.
   c. Agencies of socialization.

4. Social Groups:
   a. 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.

5. Family:
    a. The family, meaning and definitions.
    b. Functions of types of family
    c. Changing family patterns
    d. Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.

6. Community:
    a. Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal community.
    b. Urban community: Meaning and features- Health hazards of urbanities.

7. Culture and Health:
    a. Concept of Health
    b. Concept of Culture
    c. Culture and Health
    d. Culture and Health Disorders

8. Social change:
    a. Meaning of social changes.
    b. Factors of social changes.
    c. Human adaptation and social change
    d. Social change and stress.
    e. Social change and deviance.
    f. Social change and health programme
    g. The role of social planning in the improvement of health and rehabilitation.

9. 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.

10. Social Security:
    a. Social security and social legislation in relation to the disabled.

11. Social worker:
    a. Meaning of Social Work
    b. The role of a Medical Social Worker.

SEMESTER-VII

PHYSIOTHERAPY IN NEUROLOGY & PSYCHOSOMATIC DISORDER

Course description This course serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.

Seventh Semester (37-42 months)				
Course code & Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 701- Physiotherapy in Neurology & psychosomatic disorder	60	75	135	9

THEORY

1. Review of Basic Neuro Anatomy and Neuro Physiology
2. Neurological Assessment:

a) Adult:

i. Required materials for examination, Chief complaints,
ii. History taking – Present, Past, medical, familial, personal histories, Observation, Palpation,
iii. Higher mental function – Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning, and Judgment,
iv. Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity,
v. Reflexes – Developmental reflexes, deep tendon reflexes, Superficial reflexes,
vi. Sensory examination – Superficial, Deep and Cortical sensations,
vii. Special tests – Romberg's, Kernig's sign, Brudenzki sign, Tinels's sign, Slum test, Lehermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc,
viii. Balance and coordination examination,
ix. Gait analysis – Kinetics & Kinematics (Quantitative & Qualitative analysis), Functional Analysis,
x. 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.

b) Paediatric

i. Developmental milestones,
ii. Developmental reflexes,
iii. Neuro developmental screening tests.
iv. Evaluation

a. History,
b. Observation,
c. Palpation,
d. Milestone Examination,
e. Developmental reflex Examination,
f. Higher mental function,
g. Cranial nerve examination,
h. Motor & Sensory examination,
i. Reflex testing,
j. Balance & Coordination examination,
k. Gait analysis,
l. Functional analysis

3. Neuro physiological Techniques - Concepts, Principles, Techniques, Effects of following Neurophysiological techniques:

a) NDT,
b) PNF,
c) Vojta therapy,
d) Rood's Sensory motor Approach,
e) Sensory Integration Approach,
f) Brunnstorm movement therapy,
g) Motor relearning program,
h) Muscle re-education approach
i) Temple fay technique
j) Constraint induced movement therapy.

4. Physiotherapy in 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]

a) High Risk babies,
b) Minimum brain damage,
c) Developmental disorders,
d) Cerebral palsy,
e) Autism,
f) Down's Syndrome,
g) Hydrocephalus,
h) Chorea,
i) Spina bifida,
j) Syringomyelia.

k) Poliomyelitis, Post-Polio Syndrome
   - List of Problems & Complications, short&Long-term goals, Management of systemic complications, Management of MechanicalComplications, Use of various Neurophysiological approaches & Modalities.

5. Adult Neurological conditions

[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]

a) Disorders of circulation
   i. Cortical, Cerebellar, Thalamic, & Brain-stem
b) Head injury
c) Space occupying lesions
   i. Brain
   ii. Spinal cord
d) Lesions of Extra-pyramidal system & Basal ganglia
   i. Parkinsonism, Chorea, Athetosis, Dystonia, Spasmodic torticolis, Cerebellar Ataxia, etc.
e) Degenerative disorders
   i. M.N.D., Hereditary Ataxia, Peroneal muscular atrophy, Alzheimer's Disease
f) Disorders of spinal cord
   i. Spinal cord injury
      - Quadriplegia, Paraplegia
   ii. Syringomyelia
   iii. Transverse myelitis
g) Infective disorders of Nervous System
   i. Tetanus, Tabes Dorsalis, Meningitis, Encephalitis , Leprosy
h) Disorders of voluntary muscles
   i. Dystrophies, Atrophies, &
   ii. Neuro-muscular junction disorders
      - Myasthenia Gravis,
      - Eaton-Lambert Syndrome,
      -
i) Multiple sclerosis
j) Perceptual disorders
k) Bladder & Bowel Dysfunction,

6. Physiotherapy in Peripheral Nerve Injuries and Disorders:

a) Evaluation and Management
   i. Hereditary motor sensory neuropathy,

ii. Guillain-Barre syndrome,
iii. Brachial plexus palsy,
iv. Thoracic outlet syndrome,
v. Lumbosacral plexus lesions,
vi. Phrenic &intercostals nerve lesions,
vii. Median nerve palsy,
viii. Ulnar nerve palsy,
ix. Radial nerve palsy,
x. Musculocutaneous nerve palsy,
xi. Anterior & Posterior interosseous nerve palsy,
xii. Axillary nerve palsy,
xiii. Long thoracic nerve palsy,
xiv. Suprascapular nerve palsy,
xv. Sciatic nerve palsy,
xvi. Tibial nerve palsy,
xvii. Common peroneal nerve palsy,
xviii. Femoral nerve palsy,
xix. Obturator nerve palsy,
xx. Pudental nerve palsy,
xxi. Polyneuropathy :- Sub-acute combined degeneration, G B Syndrome, Alcoholic & Diabetic neuropathy, tumours.

7. Physiotherapy in Neurological gaits:

a) Assessment
   i. Quantitative and Qualitative (Kinetic & Kinematics) analysis,
b) Management
   i. Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Choreaform Gait, Diplegic Gait, and Myopathic Gait etc.

8. Physiotherapy in Pre and Post surgical conditions: Evaluation and Management

a. Spinal disc herniation,
b. Spinal stenosis,
c. Spinal cord trauma,
d. Head trauma,
e. Brain tumors,
f. Tumors of the spine,
g. Spinal cord and peripheral nerves,
h. Cerebral aneurysms,
i. Subarachnoid hemorrhages,
j. Epilepsy,
k. Parkinson's disease,

l. Hemiballism,
m. Psychiatric disorders,
n. Malformations of the nervous system,
o. Carotid artery stenosis,
p. Arteriovenous malformations,
q. Spina bifida

9. Applied Yoga in neurological conditions – Rationale of Yoga and Physiotherapy, Therapeutic benefits of Yoga.

PRACTICAL
Practical shall be conducted for all the relevant topics discussed in theory in thefollowing forms:

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Recommended books:

1. Tidy's physiotherapy.
2. Cash's Textbook of Neurology for Physiotherapists
3. Neurological Rehabilitation by D Umphred
4. Physical Rehabilitation Assessment and Treament – O'Sullivan Schmitz
5. Elements of Pediatric Physiotherapy-Eckersley
6. Title: Occupational Therapy for Physical Dysfunction - Authors: Mary Vining Radomski, Catherine A. Trombly Latham. Lippincott Williams & Wilkins.
7. DeJong's The Neurologic Examination, Authors: Campbell, William W.
8. Pediatric Physical Therapy. Authors: Jan Stephen Tecklin. Lippincott Williams & Wilkins

BIOSTATISTICS (Section –A)& RESEARCH METHODOLOGY (Section B)

Course description: This course provides basic knowledge in selected important topics in biostatistics. This course introduces the students to the types of data, data collection, tabulation, analysis and interpretation of data using suitable statistical tools. This course helps the student to understand the course on Evidence based practice also in their project work in 8th semester.

Seventh Semester (37-42 months)				
Course code & Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 702- Biostatistics **AP01PT 702-** Research Methodology	60	-	60	4

BIOSTATISTICS

(Section- A)

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 – skewness, 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).
7. Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis).

RESEARCH METHODOLOGY

(Section-B)

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 6thEdn. 1997: B.K. Mahajan
4. Biostatistics : A manual of Statistics Methods: K. Visweswara Rao
5. Elementary Statistics 1stEdn, 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, 3rdEdn..: Simpsory G. Kaftha. P
9. Research; Principles and Methods:L Denise F. Poli&Hungler
10. Fundamentals of Research, 4thEdn.: David J. fox

HEALTH PROMOTION, FITNESS AND WELLNESS

course description: This course includes discussion on health risks, screening, and assessment considering epidemiological principles. Risk reduction strategies for primary and secondary prevention, including programs for special populations are covered.

Seventh Semester (37-42 months)				
Course code & Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 704- Health Promotion and Fitness	15	30	45	3

1. Prevention practice: a holistic perspective for physiotherapy
    a. Defining Health
    b. Predictions of Health Care
    c. Comparing Holistic Medicine and Conventional Medicine
    d. Distinguishing Three Types of Prevention Practice.

2. Healthy People
    a. Definition of healthy people

b. Health education Resources
c. Physiotherapist role for a healthy community.

3. Key concepts of fitness
    a. Defining & Measuring Fitness
    b. Assessment of Stress with a Survey
    c. Visualizing Fitness
    d. Screening for Mental and Physical Fitness
    e. Body Mass Index calculations.

4. Fitness training
    a. Physical Activities Readiness Questionnaire
    b. Physical Activities Pyramid
    c. Exercise Programs
    d. Evidence-Based Practice.
    e. Health, fitness, and wellness issues during childhood and adolescence

5. Health, fitness, and wellness during adulthood

6. Women's health issues: focus on pregnancy:
7. Prevention practice for older adults
8. Resources to optimize health and wellness
9. Health protection.
10. Prevention practice for musculoskeletal conditions
11. Prevention practice for cardiopulmonary conditions
12. Prevention practice for neuromuscular conditions
13. Prevention practice for integumentary disorders
14. Prevention practice for individuals with developmental disabilities
15. Marketing health and wellness.

CLINICAL CARDIOVASCULAR AND PULMONARY CONDITIONS

Course description: Following the basic science and clinical science course, this course introduces the student in cardio-thoracic conditions which commonly cause disability.

Seventh Semester (37-42 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 705- Clinical cardiovascular & pulmonary conditions	60	-	60	4

1. Anatomy and Physiology
    a Respiratory system
        i. Upper respiratory tract
        ii. Lower respiratory tract – Trachea, Bronchial tree, Bronchopulmonary segments
        iii. Respiratory unit, hilum of lung.
        iv. Muscles of respiration
        v. Pleura, intra pleural space, intra pleural pressure, surfactant
        vi. Mechanics of respiration – Chest wall movements, lung & chest wall compliance
        vii. V/Q relationship, airway resistance
        viii. Respiratory centre, Neural & chemical regulation of respiration
        ix. Lung volumes and lung capacities, Spiro meter, lung function test
        x. Pulmonary circulation, Lung sounds, cough reflex
    b Cardiovascular systems
        i. Chambers of heart, semi lunar and atria ventricular valves
        ii. Coronary circulation, conductive system of heart
        iii. Cardiac cycle, ECG, Heart sounds
        iv. Blood pressure, pulse, cardiac output
2. Cardio Vascular system
    a Define, etiology, pathogenesis, clinical features, complications,
    b Conservative and surgical management of the following conditions
        i. Ischemia heart disease
        ii. Myocardial infarction
        iii. Heart failure
        iv. Cardiac arrest
        v. Rheumatic fever
        vi. Hypertension
        vii. Infective endocarditis
        viii. Myocarditis & cardiomyopathy

    c Cardiovascular 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.

d Disorders of the Heart – 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, Tetraology of Fallot, Transposition of Great Vessels ; Acquired Heart Disease – Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumors.

3. Respiratory System
    a. 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.

    b. Chest wall disorders- Definition, Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, chest wall tumors, Spontaneous Pneumothorax, Pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis, Tuberculosis, Bronchogenic Carcinoma, Bronchial Adenomas, Metastatic tumors of the Lung, tracheal Stenosis, Congenital tracheomalacia, Neoplasms of the trachea, Lesions of the Mediastinum. Carcinoma of the female breast.

Recommended books:

1. Davidson’s Principles and Practice of Medicine
2. Harrison’s Internal Medicine
3. Braunwald Text of Cardiology
4. Textbook of Cardiology by Hurst

PRINCIPLES OF MANAGEMENT

The course is intended to provide knowledge about the basic principles of Management.

Seventh Semester (37-42 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Not for university examination				
AP01PT 7S1-Principles of Management	30		30	2

The course is intended to provide knowledge about the basic principles of Management.

1. Introduction to management
2. Strategic Management
3. Foundations of Planning
4. Planning Tools and Techniques
5. Decision Making, conflict and stress management
6. Managing Change and Innovation
7. Understanding Groups and Teams
8. Leadership
9. Time Management
10. Cost and efficiency

CRITIQUE ENQUIRY, CASE PRESENTATION AND CASE DISCUSSION

Seventh Semester (37-42 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Not for university examination				
Critique inquiry, case presentation and discussion	-	15	15	1

SEMESTER-VIII

PHYSIOTHERAPY IN CARDIO VASCULAR, PULMONARY AND INTENSIVE CARE

Course Description: This course is designed to provide knowledge in assessing and planning physiotherapy intervention for various general, medical and surgical conditions and it serves to integrate the knowledge gained by the students in clinical cardio-respiratory condition with skills gained in exercise therapy and electrotherapy, thus enabling them to apply these in clinical situations of dysfunction due to cardio-respiratory pathology. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment and this knowledge will lead them to use physiotherapeutic measures as preventive /restorative rehabilitative

Eighth Semester (43-48 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 801-Physiotherapy in cardiovascular, pulmonary & intensive care	60	75	135	9

THEORY

1. Anatomical and Physiological differences between the Adult and Pediatric lung.
2. Bedside assessment of the patient-Adult & Pediatric.
3. Investigations and tests – Exercise tolerance Testing – Cardiac & Pulmonary, Radiographs, PFT, ABG, ECG, Hematological and Biochemical Tests.
4. Physiotherapy techniques to increase lung volume – controlled mobilization, positioning, breathing exercises, Neurophysiological Facilitation of Respiration, Mechanical aids - Incentive Spirometry, CPAP,IPPB.
5. Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids – IPPB, CPAP, BiPAP.
6. Physiotherapy techniques to clear secretions – Hydration, Humidification &Nebulisation, Mobilisation and Breathing exercises, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical Aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Nasopharyngeal Suctioning.
7. Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers.
8. Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, the neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit.
9. Physiotherapy in Obstructive lung conditions.
10. Physiotherapy in Restrictive lung conditions.
11. Management of breathlessness.

12. Pulmonary Rehabilitation.
13. Physiotherapy following Lung surgeries
14. Respiratory failure – Oxygen Therapy and Mechanical Ventilation.
15. Introduction to ICU : ICU monitoring –Apparatus, Airways and Tubes used in the ICU - Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU.
16. Physiotherapy management following cardiac surgeries.
17. Cardiac Rehabilitation.
18. Physiotherapy management following PVD.
19. Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax.
20. Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes.
21. Home program and education of family members in patient care.
22. Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity.
23. Applied Yoga inCardiovascular& Pulmonaryconditions – Rationale of Yoga and Physiotherapy, Therapeutic benefits of Yoga.

PRACTICAL

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Recommended books:

1. Tidy's physiotherapy.
2. Cash’s Textbook of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treament – O’Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley
6. Essentials of Cardiopulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardiao pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash’s Textbook 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.

COMMUNITY PHYSIOTHERAPY

Course description: The course serves to integrate the knowledge gained by the students in community medicine and other areas in clinical situations of health and disease to identify rehabilitation methods to prevent disabilities and dysfunctions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.

Eighth Semester (43-48 months)				
Course code &Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 802-Community Physiotherapy	45	45	90	6

1. Rehabilitation: Definition, Types.

2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. Disability Evaluation: Introduction, What, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings.
8. Role of Government in CBR: Laws, Policies, Programmes, Human Rights Policy, Present rehabilitation services, Legal aspects of rehabilitation.
9. Role of Social work in CBR: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation.

10. Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies
    a. 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.

11. National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker

12. 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.

13. Screening and rehabilitation of paediatric disorders in the community: Early detection of high risk babies, Maternal nutrition and education, Rehabilitation of Cerebral Palsy, Polio, Down's Syndrome, Muscular Dystrophies etc., Prevention and rehabilitation of mental retardation and Behavioral disorders, Immunization programmes, Early intervention in high risk babies, Genetic counseling.

14. Extension services and mobile units: Introduction, Need, Camp approach.

15. Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services.

16. 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.

17. Industrial Health & Ergonomics [10 hours] - 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,
    c. Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of work place-mechanical stresses per hierarchy –
        i. sedentary table work –executives, clerk,

ii. inappropriate seating arrangement- vehicle drivers
iii. constant standing- watchman- Defense forces, surgeons,
iv. Over-exertion in laborers,-common accidents –Role of P.T.-Stress management.

d. 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.
e. Biological Hazards

PRACTICAL

This will consist of Field visits to urban and rural PHC's., Visits to regional rehabilitationtraining center, Regular mobile camps, Disability surveys in villages, Disability screening, Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, paediatric, gynecological 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 books:

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De lisa
3. Textbook of CBR- Malcolm Peat
4. Textbook of Community Medicine- Park
5. CBR- Piyush Sharma
6. Textbook of rehabilitation- Sunder
7. Physical rehabilitation- Susan o' Sullivan
8. Essentials of Community-based Rehabilitation. Satya Bhushan Nagar (2017), JAPEE
9. A Concise Textbook of Community Based Rehabilitation, Satya Bhushan Nagar, Himanshu Publications ISBN: 9788179064955, 8179064956

CLINICAL REASONING AND EVIDENCE BASED PHYSIOTHERAPY PRACTICE

Eighth Semester (43-48 months)				
Course code &Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 803- Clinical reasoning & Evidence based physiotherapy	15	15	30	2

1. Introduction to Evidence Based Practice: Definitions, Evidence Based Practice,

2. Concepts of Evidence based Physiotherapy: Awareness, Consultation, Judgement, and Creativity

3. Development of Evidence based knowledge, The Individual Professional, Professionals within a discipline, and 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, Levels of evidence classification system, Outcome Measurement, Biostatistics, The critical review of research using qualitative methods

8. Systematically reviewing the evidence: Stages of systematic reviews, Meta-analysis, The Cochrane collaboration

9. Economic evaluation of the evidence: Types of economic evaluation, conducting economic evaluation, critically reviewing economic evaluation, locating economic evaluation in the literature

10. Using the evidence: Building evidence in practice; Critically Appraised Topics (CATs), CAT format, Using CATs, Drawbacks of CATs

11. 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

12. 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

13. Research dissemination and transfer of knowledge: Models of research transfer, Concrete research transfer strategies, Evidence based policy

ADMINISTRATION AND TEACHING SKILLS

Eighth Semester (43-48 months)				
Course code &Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 804-Administration and Teaching Skills	15	30	45	3

1. Introduction:
    a. 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.
    b. Principles of hospital administration and its applications to physiotherapy.
    c. Planning and organization: Planning cycle, Principles of organizational charts, Resource and quality management, planning change -innovation
    d. Financial issues including budget and income generation
    e. Hospital administration: Organization, Staffing, Information, Communication, Coordination, Cost of services, Monitoring and evaluation.
    f. Organization of physiotherapy department: Planning, Space, Manpower, Other basic resources.
    g. Organizing meetings, committees, and negotiations
    h. Personnel management: Personnel performance appraisal system, Quality care delivery from the staff.
2. Aims of physiotherapy education
    a. Concepts of teaching and learning
    b. Curriculum development
    c. Principles and methods of academic and clinical teaching
    d. Measurement and evaluation
    e. Guidance and counseling
    f. Faculty development program
    g. Administration in clinical setting
    h. Use of A-V aids in teaching
    i. Taxonomy of education

RESEARCH PROJECT

The project is mandatory for a student to understand the steps in research. This also gives opportunity for a student to work in group. The project may be a case study or of recent technique or literature reviews and etc. to make the student to have research mind and to facilitate for higher studies.

Eighth Semester (43-48 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
AP01PT 8PR- Research Project	15	30	45	3

CLINICAL EDUCATION

Students will be posted in rotation in the following areas/wards. Thestudents 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.

Eighth Semester (43-48 months)				
Course Titles	**Hours**			**Weekly class hours**
	Theory	**Practical**	**Total**	
Clinical education	-	195	195	13

1. Physiotherapy OPD
2. Neurology, Neurosurgery & Neuro ICU
3. Community-PHC
4. Orthopedics
5. General Medicine & MICU
6. General Surgery & CTS ICU
7. Developmental Pediatrics & Child Guidance Clinic
8. OBG
9. Geriatric – Old Age Homes
10. Industrial Visits - Ergonomics

INTERNSHIP

The internship time period provides the students the opportunity to continue todevelop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas. Students will participate in advanced and specialized treatment procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 7 hours per day.

1. **Initial Assessment Documentation:** Clinical staff must document the following information:

    a. Initial assessment documented based on SOAP format.
    b. Subjective examination (symptomatic)
    c. Objective examination (measureable, observable)
    d. Action/Analysis (interpretation of current condition/intervention provided)
    e. Plan of action
    f. Written or verbal feedback to the client or other relevant carers
    g. Discharge plan documented
    h. Agreement to treatment plan by patient or "person responsible"

2. **Progress Documentation:** Progress documentation may include the following information:

    a. Any individual intervention should be documented in SOAP format (including response to intervention/s using outcome measures)
    b. Oral consent obtained and documented when there is a significant change in treatment/ treatment options/ status of patient's health.
    c. Written consent obtained for designated invasive procedures
    d. Change in status or events that may affect discharge plans/goals
    e. Documented consultation with key clinical team members