



## Bahria University College of Physical Therapy (BUCPT)

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## Message from the desk of Principal & Dean

### Major General (R)

Professor Dr. Shehla M. Baqai HI(M)  
MBBS, FCPS (Obstetrics & Gynaecology), FICS, MCPS-HPE  
Bahria University Health Sciences Campus Karachi



Heartiest congratulations and welcome to the prestigious Bahria University College of Physical Therapy. We are thrilled to have you join our community of aspiring healthcare professionals.

Entering Physical Therapy School is a remarkable milestone in your life, and is a testament to your hard work, dedication and passion towards achieving your goals. You have chosen a noble profession that requires not only academic excellence but also a deep commitment to serve fellow beings with honesty, compassion and empathy.

As the Dean of this esteemed institution, I want to assure you that we all are fully committed to providing you with the best education and training. State of the art facilities, competent and proficient faculty members will provide necessary guidance through this transformative journey. They will challenge you, push you to excel, and support you at every step of the way.

We believe in the holistic development of our students, inculcating emotional intelligence, communication skills, cultural competence, and ethical integrity. Opportunities to cultivate these qualities are provided through workshops, seminars, field visits, co-curricular and extracurricular activities. The curriculum is delivered through active learning strategies like small group discussion (SGD) etc. The study program supports social & moral development of medical students besides achieving academic excellence.

Physical therapy Education requires presence of mind, perseverance and devotion. There will be challenges along the way, but always remember why you chose this path and the impact you aspire to make in the lives of patients and their families. Strive hard with full sincerity & devotion

I wish you a smooth sailing during your five years stay with us & pray for your bright and successful future!

**Maj. Gen. Prof. Shehla M. Baqai HI(M)**  
Principal, BUMC & Dean-HS, BU  
BUHSCK

## PRINCIPAL 'S MESSAGE

**Senior Associate Professor. Dr. Khalid Aziz**

Principal College of Physical Therapy

Bahria University Health Sciences Campus, Karachi

BSPT, MSPT, PPDPT/MPhil PGDPA,

PGPT (Japan) PGPT (USA, UK)



'Dear Students,

Heartiest congratulations and welcome to the Bahria University college of Physical therapy. Selection in Bahria University college of Physical therapy is the evidence of sheer hard work. Incessant struggle and relentless Efforts towards achieving the goals. State of the art facilities and adroit faculty of this college will ensure smooth transition from PT student to a highly trained practitioner. The logical convergence towards the aim will be explained stepwise in the study guide which includes forthcoming activities, content, and learning strategies.

I am feeling very delighted to welcome the DPT student of IX batch.

It was a historic moment for all of us to start Physical therapy program in Bahria University in 2017.

BUCPT is uniquely positioned among Physical therapy institutes in Karachi. It is our commitment to make it a successful.

Bahria University is chartered by the Government of Pakistan and recognize by HEC. It is one of the best Universities in Pakistan.

There are rapid changes occurring in medical education all over the world. We will try our Level best to meet the challenges and achieve international standards. The highly proficient teaching faculty will provide necessary guidance related to learning objectives, effective Use of teaching tools and integrated teaching methods which facilitates students to enhance knowledge. All subjects are covered by subject specialist which unique us from other institutions. The curriculum also includes small group interactive methods like Problem Based Learning (PBL) which is a modern and scientific teaching strategy. We are committed to provide the best to our students. This University provides the environment to groom students and make them able to approach future goals. BUCPT always provide you quality education and opportunities for research. **GOD BLESSES YOU**

*Khalid Aziz*  
Dr. Khalid Aziz  
Principal BUCPT

## Objectives of Study Guide:

The purpose of this study guide is to:

- Inform students what they are expected to learn during their study period.
- Guide students how student-learning program has been organized and how it would be implemented.
- Help students organize and manage their studies throughout the year.
- Provide information about the system of assessment.
- Inform students about the code of conduct of Bahria University
- Impart the information on learning methods that you will experience during the course. The methods include: tutorials, lectures, practical skills, experiments, field visits and research. These learning methods should help you to achieve the course objectives.
- Inform regarding the examination policy, rules and regulations.

## **INTRODUCTION:**

### **Bahria University College Of Physical Therapy**

Bahria University College of Physical Therapy was established in 2017. It is located in Bahria University medical and dental college building. The College has a beautiful custom built building with all facilities for education like tutorial rooms, labs, lecture halls, and other facilities. You are lucky to be selected for 5 years DPT program and it is your utmost responsibility to make it successful. College provides all necessities to impart Physical Therapy education up to at par with the international standards. The Bahria University medical and dental college building houses a beautiful auditorium, library with internet links to all educational facilities, skill laboratory, advanced multidisciplinary laboratory for research work and full flash video link facility.

The clinical teaching wing is PNS SHIFA, a tertiary care hospital which takes care of Armed Forces Personnel, their families, parents and civilian patients. There is a large variety of clinical cases for students to see and learn from. Emergency and intensive care facilities are available. About 1500 patients visit PNS Shifa daily. The outpatient departments in all disciplines are in full use and well organized. Where patients are seen promptly, Investigations like laboratory tests, X rays and advanced imaging techniques are available on site. Patients are referred to the concerned department. Doctors work as a team to ensure best care of the patient.

Students will be taken on by teams of doctors and taught clinical management in the best possible setting i.e. the bedside of the patient teaching, OPD, emergency room, ICU, CCU. They will also be taken into the community during their rotation with Community Health Sciences Department. The Students will be taught research methodology and expected to do research work. Students will be observed and continuously provided feedback to improve cognitive and professional skills and behavior. The physical therapy department of PNS Shifa is fully equipped and will provide complete exposure for clinical training of physical therapy to students both in and out door patient departments. It is expected that students will make a seamless transit from basic sciences to clinical sciences.

Each year is organized in 2 semesters. It is mandatory for students to appear in all presentations and quizzes. In failure to do so they will be dealt according to the rules and regulation of examination. The community support program is an essential feature and requirement for the degree of DPT program.

**Strictly prohibited!**

**Use of mobile phones in  
teaching sessions,  
wards, clinics,**

## **VISION AND MISSION OF BUCPT**

### **VISION**

To become an internationally recognized university that contributes towards development of nation through excellence in education and research.

### **MISSION**

To pursue academic excellence by preparing competent professionals through provision of patient centric, evidence-based physical therapy education, in a collegiate environment, at par with national and international standards to improve physical health and well-being of the society.

### **THE COLLEGE AIMS TO REALIZE THIS MISSION BY:**

1. Training the health sector workforce of the future
2. Conducting research that creates new knowledge in the field of health sciences and reviews improvement in existing bodies of knowledge.
3. Providing innovative, patient-oriented health care
4. Contributing to the economic development and wellbeing of Pakistan through integrated programs in education, research and clinical care.



## **COMPETENCIES OF PHYSICAL THERAPY DOCTOR:**

**The graduate Physical Therapy Doctor must be a:**

### **Care provider**

Provide care on ethical principles in different settings, emergencies; applies scientific principles of basic, clinical and behavioral sciences to formulate diagnosis; suggest essential investigations, cost effective Physical therapy treatment. Perform physical examination, basic skills, procedures according to protocol.

### **Communicator**

Interview patients, families skillfully to gather information for formulating diagnosis, treatment; counsel patients, families, communities on health maintenance and promotion; communicate effectively with health care team including peers, supervisors

### **Advocate for health promotion**

Counsel individuals, families, communities on improved lifestyle; maintenance and promotion of health.

### **Professional**

Value and Display behaviors befitting to the profession such as honesty, empathy, punctuality, patience, respect for patients and their families, colleagues; accepting one's limitations.

### **Critical thinker**

Engage in research projects, assignments, surveys. Search for evidence; analyze facts, data, pros, and cons to identify and solve problems. Reflect and write articles, short notes, commentaries.

### **Lifelong learner**

Seek and update knowledge from multiple sources; Consult scientific evidence including journals, web-based knowledge and others; discussion with scholars, practitioners, colleagues; reflection; participation in activities; continuously improve computer skills

### **Team Worker**

Respect and value the contribution of the health team; collaborate with the team to provide efficient patient care.

## **LEARNING OUTCOMES FOR DOCTOR OF PHYSICAL THERAPY (D.P.T):**

The outcome of the Doctor of Physical Therapy (DPT) program is to prepare physical therapists who will:

1. Be primary providers of physical therapy care.
2. Serve as responsible members in the professional community and are willing and able to assume leadership roles in the communities they serve.
3. Identify researchable problems, advocate and participate in the research, and incorporate research findings into clinical practice.
4. Understand and place in context the social, economic and cultural issues of practice and effectively advocate for changes in policy.
5. Correlate theory with practice and think creatively about, react to, adapt or shape new practice environments.
6. Participate in and provide education for communities, patients, peers students and others.

## **STUDENT'S CODE OF CONDUCT**

The administrations oversee the code of conduct, discipline, dress code and educational performance. There is a Chairperson for Student Affairs. The Principal BUCPT or faculty members can be approached as appropriate regarding queries on educational matters, any breach of discipline, and advice about leave of absence or leave for medical reasons. All faculty members are also responsible for maintaining all aspects of discipline. Breaches of the university's code of conduct are routinely referred to the committee and disciplinary action is taken as it deems appropriate.

**1. Dresscode:**

**Male students:**

1. Casual Trousers
2. Jeans(Plain blue) without an images, graphics and write ups
3. Casual Shirts (Half/ Full sleeves)
4. T Shirts without any messages, images, graphics and write ups
5. Casual shoes or Joggers with socks
6. Shalwar Qameez with shoes (only on Friday)
7. Suit/ Combination
8. Coat/ Pullovers/ Sweaters/ Jackets in winter

**Female students:**

1. Shalwar Qameez
2. Hijab, Abaya, Chaddar etc
3. Full length Jeans with long shirt/ kurta (kneelength)
4. Light jewelry and light makeup
5. Shoes, Sandals and Joggers
6. Dupatta/ Scarf is compulsory with all dresses.

**NOTE: BUCPT students should wear white coat during classes, hospital rotations and other wise as appropriate.**

**2. Personal behavior:**

Your personal behavior at all times should reflect that you are an educated person who is aiming to develop good professional conduct. Please remember to greet your teachers and fellow students as is commensurate with religion and the norms dictated by our society. Politeness should be your guideline. Tidiness and cleanliness must be adhered to at all times. Please do not litter the BUHSC premises. If you see any litter, please pick it up and dispose of it in a litter bin. Rowdy and abusive behavior is to be avoided at all costs. Please report to the vice principal or your Mentor or a senior faculty member if you have experienced such behavior. Men and women will be working closely together in BUHSC. Be polite and considerate. You should never use gender as basis for teasing or abuse. Violence against students, faculty and staff will be dealt with severely. Ethnic or religious intolerance will not be tolerated at all. Politeness towards auxiliary and support staff is expected at all times.

3. **Punctuality:**

Please be prompt and punctual. Classes will start on time. A teacher may choose to mark you absent if you come late to class. Punctuality is also expected from you in the practical classes, demonstrations and ward clinics. If your teaching involves a patient then punctuality is very important because this person, who is ill, has done you the courtesy of allowing you to learn from their suffering. Punctuality also means being on time when using college transport. Do not keep other people waiting.

Punctuality also means that you return from holidays one day before the college opens so that you do not miss classes. At BUCPT education starts immediately after any holiday. There is no lag period after leave. You may have a quiz or exam on the day the college re-opens. There will be no relaxation for students who are absent. Please inform your parents of this and make your travel arrangements accordingly. Avoid taking leave for personal reasons like weddings during the academic year.

4. **Conduct in the hospital:**

When you are working in the hospital be quiet, avoid rowdiness and unnecessary laughter and chatter. Remember the patients need peace, quiet and their rest. You must always wear a white coat. Ladies will wear their dupattas inside the white coat and the gentlemen's ties must be tucked inside the shirt so that infection is not carried from one area to the next. Shoe covers, sterile aprons, caps and gowns must be worn where appropriate. Be polite to the patients, greet them appropriately and inquire after their health and wish them well. All nursing staff must be addressed appropriately and politely. Don't hang around once your work is done. Do not eat or drink inside the wards and treatment areas. Avoid making phone calls and put your phones on the silent mode.

5. **Conduct in the library, cafeteria and common rooms:**

Whenever you are working or studying in the common areas or relaxing in the cafeteria your behavior should be polite, quiet and should not disrupt anybody else's work or study. Loud conversation, loud phone calls, shouting across the room are to be avoided. If you are listening to music, use headphones. Be polite to all the staff. Smoking is not permitted anywhere on BUMDC premises or the hospital.

### **COLLEGE DISCIPLINARY COMMITTEE:**

The College Disciplinary Committee deals with the maintenance of discipline on-campus. All cases of breach of discipline will be brought before this committee. The ruling of the committee cannot be challenged. The student will be dealt with accordingly.

#### **Students are to avoid the following:-**

- a) Unauthorized use of the University's name or logo that is the property of the University
- b) Harassment, sexual or otherwise, or intimidation of any member of the University community
- c) Coming late for classes. The student may be considered absent and marked accordingly.
- d) Improper/inappropriate dress
- e) Loud and disruptive or aggressive behavior in the Cafeteria or Common rooms or on the premises of BUMDC, BUCPT or PNS Shifa.
- f) Non clearance of bills/dues. The non-clearance of dues may cause a student to be withheld from a professional examination. The student may also be refused permission to attend classes.

## **STUDENT'S POLICY GUIDELINES**

### **ATTENDANCE POLICY FOR REGULAR STUDENTS.**

- Minimum attendance requirement is 75% in each subject: attendance is for lectures, demos, practical , clinics, PBLs, counseling, presentations etc.: indoor and outdoor
- The attendance is not simply for lectures.
- No shortfall in attendance will be condoned in any case by any authority.

Attendance is maintained by the Department of Scholastic Records at BUHSC.

All students should try and achieve 100% attendance. Every teaching session is essential. For clinical students remember a disease being demonstrated may not be seen during the rest of your stay in the college again. You will make the mistake of a life time by missing the opportunity to attend a clinical demonstration. You must have at least 75% attendance in to be permitted to sit for the professional examination.

- Lecture Attendance is marked at the start of the class.
- Students who come more than 10 minutes late are marked absent.
- A random head count is done to ensure correct entry of attendance.
- The attendance sheet is signed by the teacher and sent to Scholastics Department.
- The attendance is entered into the spreadsheet as soon as possible on that day.
- No correction will be made later than 24 hours as the system is then locked.

Attendance for clinics, demonstrations, practicals etc.

- Student signs the attendance sheet in front of the teacher.
- The teacher countersigns it daily.
- Weekly attendance is given by the CR to the Scholastics Department - every Monday.
- Attendance submitted later than Friday of the current week will not be accepted.

**If you have less than 75% attendance, you will not be allowed to sit in semester examination.**

## **ELIGIBILITY CRITERIA FOR APPEARING IN FINAL SEMESTER EXAMINATIONS**

A student will be eligible to appear in the Semester examination if he/she fulfills the following criteria:

1. 75% attendance.
2. Must have cleared all financial dues.
3. Must have appeared in midterm CAT Presentation and others.
4. No breach of discipline should have occurred for which the Disciplinary Committee has advocated a punishment.

## **LEARNING STRATEGIES**

### **Interactive Lectures**

The traditional lecture system is used to introduce a subject and discuss the broad concepts in that specific field of study. Interactive lectures to smaller groups remain an effective and essential way of teaching. More recent methods of learning and teaching, such as case-based learning and small group-based problem-solving sessions are also employed.

### **Small Group Based Learning**

Small group and tutorial sessions are regularly held every week to enable students to discuss the details of a lecture topic. Students are expected to prepare presentations on applied topics and discuss their implications with their fellow students. The lecturer acts as a facilitator. By participating in these group discussions, students can interact and learn from one another.

### **Hands on Training**

Practical sessions are conducted to reinforce concepts developed during theoretical sessions. Laboratory work is a vital part of Anatomy, Physiology, and Kinesiology which provides an opportunity for students to make their own personal observations in relation to the theoretical knowledge they gain. Lectures and tutorials are held for providing clinical orientation on the subjects.

Clinically-oriented topics are identified within the framework of anatomical information, which are structured, and case-based.

### **Clinical/Practical Learning**

Theoretical and practical knowledge is augmented with community services and early integration of clinics.

## **Seminars**

The BUCPT regularly organizes seminars where groups of students are encouraged to independently present topics of general interest before a larger audience. This encourages students to read beyond their textbooks and learn how to support their knowledge with research and help them in improving their communication skills to develop leadership qualities.

## **Community-based Learning**

BUCPT is committed to provide the environment and training that would enable professionals to successfully contribute to the improvement of the health sector, particularly in less privileged communities under the Community-Oriented Medical Education Program.

The university involves its students in research-developing work in these designated communities. Students are encouraged to participate in the preventive and curative care and management of patients and their families in Primary Health Care field settings.

### **Head Counselor/Head Mentor:**

BUCPT have student assisting program such as mentoring. Mentors have been already assigned at the start of teaching program. The students will meet the assigned mentor in the mentor's office to discuss academic, non-academic, experiences, problems for advice and guidance.

## **Who to contact?**

The class is divided into equal groups of students and each group has a designated teacher, who works as their mentor. The students will meet their mentor once a month, first Friday of the month, in their office to discuss the academic, social, and other problems with them and seek their advice and guidance.

The mentor will report to the head mentor monthly, in case any problem is not resolved even at that level, then the head mentor can refer the case to Vice Principal and then Principal accordingly.



## **THE SEMESTER SYSTEM:**

### **Organization of Semester Curriculum and teaching.**

- a) Each Academic Year IS divided in to 2 Semester.
- b) Learning objectives for each semester are written down study guide issued at the beginng of each academic year to each student. Curriculum for each semester can be provided.
- c) A schedule is issued for each semester re-enforced by a mothly schedule.
- d) This includes lecture, practical's Demonstrations, Tutorials Counseling, Self. Study and Library period.
- e) The assessment result is displayed on departmental notice boards and recorded in the Examinations Department BU.

### **ASSESSMENT POLICY FOR SEMESTER**

There is a policy of ongoing or formative assessment of all students and summative assessment at the end of the semester.

#### **Formative or ongoing assessment:**

- . Practical journals, marks for tutorials.
- . End of semester examination, Cats, quizzes, and tests held in a department.

#### **Summative Assessment:**

The semester exam comprises:

- \* OSCE or OSPE examination
- \* Viva voce exam.
- \* Written theory examination
- \* The written examination

## **Summer Semester:**

- It is offered after the spring semester.
- It comprises 8 weeks.
- Registration of courses shall be for retaking failed courses and/or for improvement of grades \_C' and \_D' only.
- Registration shall be limited to a maximum of two courses. The third course may be permitted by the campus head.

## **Preparation & Award of Degrees:**

- For undergraduate degree programs, the minimum CGPA to qualify for the award of the degree is 2.0 CGPA.

## **Retakes Of Mid-Term and Final Examination:**

- Retakes shall be allowed to students only in situations of self-hospitalization and bereavement in the immediate family (parents, siblings, spouse and children)
- Retake shall be held one week after the examination.
- Fee will be applied for Retake Exam

## **Probation, Chance, And Drop Rules for Underperforming Students:**

- In any semester a shall be placed on probation for failing to achieve the minimum CGPA (GPA if it is the first semester) stipulated for the program as the minimum of 2.0 CGPA/GPA

## **Students Affair and Student Assist Programs:**

Chairperson of student affairs is assigned to cooperate with students and parents concerning academic and non-academic matters and can be contacted according to availability or after setting appointment.

### **Clubs for Extracurricular Activities:**

Different clubs for extracurricular activities are established for students to participate.

1. Literary and debates society
2. Arts and dramatic society
3. Adventure club
4. Event club
5. Community support club
6. Sports club
7. Media club
8. Music club

## (DPT) CURRICULAM SCHEME OF STUDIES

### **Semester-1**

Sr.No.	Course Title	Credit Hours
1	ANATOMY -I (Theory) ANATOMY -I (Practical)	4(3-1)
2	PHYSIOLOGY-I (Theory) PHYSIOLOGY-I (Practical)	3(2-1)
3	KINESIOLOGY-I (Theory) KINESIOLOGY-I (Practical)	3(2-1)
4	ENGLISH-I (FUNCTIONAL ENGLISH)	3(3-0)
5	PAKISTAN STUDIES	2(2-0)
6	INTRODUCTION TO COMPUTER	3(2-1)
	TAJWEED	Non CH 1 hour/week
<b>Total Credit Hours in Semester-1</b>		<b>18</b>

### **Semester-2**

Sr.No.	Course Title	Credit Hours
1	ANATOMY -II (Theory) ANATOMY -II (Practical)	4(3-1)
2	PHYSIOLOGY-II (Theory) PHYSIOLOGY-II (Practical)	3(2-1)
3	KINESIOLOGY-II (Theory) KINESIOLOGY-II (Practical)	3(2-1)
4	ENGLISH-II (COMMUNICATION SKILLS)	3(3-0)
5	ISLAMIC STUDIES / ETHICS	2(2-0)
6	SOCIOLOGY	2(2-0)
7	CIVIL SOCIETY AND DEVELOPMENT	2(2-0)
8	UNDERSTANDING QURAN-I	Non CH 1 hour/week
<b>Total Credit Hours in Semester-2</b>		<b>19</b>

### Semester-3

<i>Sr.No.</i>	<i>Course Title</i>	<i>Credit Hours</i>
<b>SECOND PROFESSIONAL YEAR</b>		
01	ENGLISH-III (Technical Writing & Presentation Skills)	3(3-0)
02	MEDICAL PHYSICS (Theory) MEDICAL PHYSICS (Practical)	3(2-1)
03	ANATOMY -III (Theory) ANATOMY -III (Practical)	3(2-1)
04	PHYSIOLOGY-III (Theory) PHYSIOLOGY-III (Practical)	3(2-1)
05	BIOMECHANICS & ERGONOMICS-I	3(3-0)
06	BIostatistics I	3(3-0)
07	ENTREPRENEURSHIP	2(2-0)
08	UNDERSTANDING QURAN-II	NON CH 1 HOUR/WEEK K
<b>Total Credit Hours in Semester-3</b>		<b>20</b>

### Semester-4

<i>Sr.No.</i>	<i>Course Title</i>	<i>Credit Hours</i>
01	ANATOMY-IV (Neuro Anatomy) (Theory) ANATOMY-IV (Neuro Anatomy) (Practical)	3(2-1)
02	BIOMECHANICS & ERGONOMICS-II	3(2-1)
03	HEALTH & WELNESS	2(2-0)
04	BIostatistics II (university optional)	3(3-0)
05	PROFESSIONAL PRACTICE (LAWS , ETHICS &ADMINISTRATION)	2(2-0)
06	EXERCISE PHYSIOLOGY (Theory) EXERCISE PHYSIOLOGY (Practical)	3(2-1)
07	MOLECULAR BIOLOGY & GENETICS	2(2-0)
08	UNDERSTANDING QURAN-III	NON CH 1 HOUR/WEEK
09	IDEOLOGY AND CONSTITUTION OF PAKISTAN	2(2-0)
<b>Total Credit Hours in Semester-4</b>		<b>20</b>

### Semester-5

Sr.No.	Course Title	Credit Hours
<b>THIRD PROFESSIONAL YEAR</b>		
01	PATHOLOGY & MICROBIOLOGY I	2(2-0)
02	PHARMACOLOGY & THERAPEUTICS I	2(2-0)
03	PHYSICAL AGENTS & ELECTROTHERAPY I (Theory) PHYSICAL AGENTS & ELECTROTHERAPY I (Practical)	3(2-1)
04	THERAPEUTIC EXERCISES & TECHNIQUES (Theory) THERAPEUTIC EXERCISES & TECHNIQUES (Practical)	3(2-1)
05	BIOCHEMISTRY I	2(2-0)
06	BEHAVIORAL SCIENCES (PSYCHOLOGY & ETHICS)	2(2-0)
07	SUPERVISED CLINICAL PRACTICE I (Practical)	3(0-3)
08	UNDERSTANDING QURAN-IV	NON CH 1 HOUR/WEEK
<b>Total Credit Hours in Semester-5</b>		<b>17</b>

## Semester-6

Sr.No.	Course Title	Credit Hours
01	PATHOLOGY & MICROBIOLOGY II (Theory) PATHOLOGY & MICROBIOLOGY II (Practical)	3(2-1)
02	PHARMACOLOGY & THERAPEUTICS II	2(2-0)
03	PHYSICAL AGENTS & ELECTROTHERAPY -II (Theory) PHYSICAL AGENTS & ELECTROTHERAPY -II (Practical)	3(2-1)
04	BIOCHEMISTRY II (Theory) BIOCHEMISTRY II (Practical)	3(2-1)
05	COMMUNITY MEDICINE & REHABILITATION	3(3-0)
06	SUPERVISED CLINICAL PRACTICE II (Practical)	3(0-3)
07	UNDERSTANDING QURAN-V	NON CH 1 HOUR/WEEK
<b>Total Credit Hours in Semester-6</b>		<b>17</b>

**Semester-7**

<b>Sr.No.</b>	<b>Course Title</b>	<b>Credit Hours</b>
<b>FOURTH PROFESSIONAL YEAR</b>		
01	MEDICINE I	3(3-0)
02	SURGERY I	3(3-0)
03	RADIOLOGY & DIAGNOSTIC IMAGING (Theory) RADIOLOGY & DIAGNOSTIC IMAGING (Practical)	3(2-1)
04	MUSCULOSKELETAL PHYSICAL THERAPY (Theory) MUSCULOSKELETAL PHYSICAL THERAPY (Practical)	3(2-1)
05	EVIDENCE BASED PRACTICE (Theory) EVIDENCE BASED PRACTICE (Practical)	3(2-1)
06	SUPERVISED CLINICAL PRACTICE III (Practical)	3(0-3)
07	SEERAH- I	NON CH 1 HOUR/WEEK
<b>Total Credit Hours in Semester-7</b>		<b>18</b>



## Semester-8

Sr.No.	Course Title	Credit Hours
1	MEDICINE II	3(3-0)
2	SURGERY II	3(3-0)
3	NEUROLOGICAL PHYSICAL THERAPY (Theory) NEUROLOGICAL PHYSICAL THERAPY (Practical)	3(2-1)
4	SCIENTIFIC INQUIRY &	3(2-1)
	RESEARCH METHODOLOGY (Theory) SCIENTIFIC INQUIRY & RESEARCH METHODOLOGY (Practical)	
5	EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY (Theory) EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY (Practical)	3(2-1)
6	SUPERVISED CLINICAL PRACTICE IV (Practical)	3(0-3)
7	SEERAH -II	NON CH 1 HOUR/WEEK
<b>Total Credit Hours in Semester-8</b>		<b>18</b>

### Semester-9

Sr.No.	Course Title	Credit Hours
01	CARDIOPULMONARY PHYSICAL THERAPY (Theory) CARDIOPULMONARY PHYSICAL THERAPY (Practical)	3(2-1)
02	PROSTHETICS & ORTHOTICS	2(2-0)
03	CLINICAL DECISION MAKING & DIFFERENTIAL DIAGNOSIS	3(3-0)
04	MANUAL THERAPY	3(2-1)
	(Theory) MANUAL THERAPY (Practical)	
05	INTEGUMENTARY PHYSICAL THERAPY (Theory)	2(2-0)
06	SUPERVISED CLINICAL PRACTICE V (Practical)	4(0-4)
<b>Total Credit Hours in Semester-9</b>		<b>18</b>

### Semester-10

Sr.No.	Course Title	Credit Hours
01	OBSTETRICS & GYNAECOLOGICAL PHYSICAL THERAPY	2(2-0)
02	PAEDIATRIC PHYSICAL THERAPY	2(2-0)
03	GERONTOLOGY & GERIATRIC PHYSICAL THERAPY	2(2-0)
04	SPORTS PHYSICAL THERAPY	2(2-0)
05	SUPERVISED CLINICAL PRACTICE VI (Practical)	4(0-4)
06	RESEARCH PROJECT	6
<b>Total Credit Hours in Semester-10</b>		<b>18</b>
<b>TOTAL CREDIT HOURS</b>		<b>182</b>
<b>Total theory/Lectures for Ten Semesters</b> <b>136</b> <b>Total Practical Hours for Ten Semesters</b> <b>46</b>		

**Theory:** one credit hour shall be equal to one hour of teaching per week throughout the semester.

**Practical / lab:** one credit hour shall be equal to two hours of lab work per week throughout the semester.

**Clinical:** one credit hour shall be equal to three hours of clinical work per week throughout the semester.

**Research:** One credit hour shall be equal to three hours of research work per week throughout the semester.

# COURSE CONTENT OF DPT CURRICULUM

## FIRST SEMESTER

Sr. No.	Course Title	Credit Hours
1	ANATOMY -I (Theory) ANATOMY -I (Practical)	4(3-1)
2	PHYSIOLOGY-I (Theory) PHYSIOLOGY-I (Practical)	3(2-1)
3	KINESIOLOGY-I (Theory) KINESIOLOGY-I (Practical)	3(2-1)
4	ENGLISH-I (FUNCTIONAL ENGLISH)	3(3-0)
5	PAKISTAN STUDIES	2(2-0)
6	INTRODUCTION TO COMPUTER	3(2-1)
	TAJWEED	Non CH 1 hour/week
<b>Total Credit Hours in Semester-1</b>		<b>18</b>

## **COURSE DESCRIPTION**

The focus of this course is an in-depth study and analysis of the general and regional organization of the human body. Emphasis is placed upon structure and function of human movement. A comprehensive study of human anatomy histology, embryology, with emphasis on the nervous, musculoskeletal, and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, models, projected materials and radiographs are utilized to identify anatomical landmarks and configurations of the upper limb.

## **PROGRAMME EDUCATIONAL OBJECTIVES:**

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

- Classify different systems of human body
- Relate the structure and division of cell with cell cycle
- Identify and explain the basic histological tissue types along with their modifications
- Recognize and explain the basic developmental processes
- Demonstrate lab safety protocols and recall the basic equipment and solutions required to perform experimental procedures.
- Explain the organization, bones, joints, muscles and neurovascular structures of upper limb

## **PROGRAMME LEARNING OBJECTIVES:**

1. Describe the functional organization of human body
2. Discuss the anatomical terms, planes and sections
3. Perform the body movements in different planes
4. Describe the structure of cell with cell membrane and sub cellular organelles
5. Relate the parts of compound microscope with their function
6. Demonstrate the steps of tissue processing; Fixation, Embedding, Sectioning and Staining

7. Correlate the classification of bones with their structure
8. Relate the classification of cartilage with their location in human body
9. Relate the classification of joints and their movements
10. Classify muscles based on their location, shape, action and type of fibers
11. Explain the structural organization of nervous system
12. Explain the structural organization of cardiovascular system
13. Discuss gametogenesis (oogenesis and spermatogenesis)
14. Discuss the uterine and ovarian cycle
15. Describe the events of the first week of development
16. Relate the abnormalities of placenta with its normal developmental process
17. Relate the microscopic features of epithelial tissues and their surface modifications with their functional importance
18. Describe the microscopic features of connective tissues
19. Describe the microscopic features of Integumentary system
20. Relate the microscopic features of different types of cartilage with their location
21. Describe the microscopic features of compact and spongy bone
22. Describe the microscopic features of skeletal and smooth muscles
23. Demonstrate the general features and attachments of:
  - a. Clavicle
  - b. Scapula
  - c. Humerus
  - d. Radius
  - e. Ulna
  - f. Bones of hand
24. Describe the anterior and posterior axion- appendicular muscles
25. Describe the muscles of the pectoral region and Clavipectoral fascia
26. Identify and explain the articulating bones, types, ligaments and movements of:
  - a. Acromioclavicular and Sternoclavicular joints
  - b. Shoulder joint (rotator cuff muscles and shoulder girdle)
  - c. Elbow joint

- d. Superior and Inferior radioulnar joints
  - e. Wrist joint
  - f. Joints of hand
27. Explain the boundaries and contents of axilla
  28. Describe the muscles and neurovascular supply of the muscular compartments of arm
  29. Describe the brachial plexus its formation and branches
  30. Describe the anterior and posterior muscular compartments and the neurovascular supply of forearm
  31. Discuss the boundaries and contents of the cubital fossa
  32. Describe the extent, relations and the branches of radial and ulnar arteries
  33. Enumerate the arteries taking part in the anastomosis around scapula and elbow joint
  34. Describe the flexor and extensor retinacula with their attachments and structures passing superficial and deep to them
  35. Describe the features of palmar aponeurosis
  36. Describe the neurovascular supply and actions of intrinsic muscles of hand
  37. Describe the superficial and deep palmar arches of hand
  38. Perform the surface marking of following structures on a standardized subject (S&A)
    - a. Brachial artery
    - b. Radial artery
    - c. Ulnar artery
    - d. Superficial and deep palmar arches
    - e. Median nerve
    - f. Radial nerve
    - g. Ulnar nerve
    - h. Flexor and extensor retinacula
  39. Interpret the radiographs of upper limb



## **COURSE CONTENTS**

### **GENERAL ANATOMY AND FUNCTIONAL ANATOMY**

- || Terms related to position and movements.
- || The skin and subcutaneous tissues
- || Layers of skin
- || Integuments of skin
- || Glands associated with hair follicle
- || Microscopic picture of skin

### **BONES AND CARTILAGES**

- || Osteology
- || Functions of Bones
- || Classification of bones
- || Parts of developing long bones
- || Blood supply of bones
- || Lymphatic vessels & nerve supply
- || Rule of direction of nutrient foramen
- || Gross structure of long bone
- || Surface marking
- || Cartilage
- || Development of bone and cartilage
- || Microscopic picture of cartilage and bone

### **THE MUSCLE**

- || Introduction
- || Classification
- || Histological Classification
- || Functions of muscles in general
- || Type of skeletal muscles
- || Parts of skeletal muscle and their action
- || Nomenclature.
- || Microscopic picture of muscle

### **STRUCTURES MUSCLES & RELATED TO BONES**

- || Tendons
- || Aponeurosis
- || Fasciae
- || Synovial bursae
- || Tendon Synovial sheaths
- || Raphael
- || Ligaments
- || Condyle
- || Epicondyle
- || Ridge
- || Tuberosity

- || Tubercle
- || Foramen
- || Canal
- || Groove
- || Process
- || Spur

## **THE JOINTS**

- || Introduction
- || Functional classification
- || Structural classification
- || Structures comprising a Synovial joint
- || Movements of joints
- || Blood supply of Synovial joints, their nerve supply and lymphatic drainage
- || Factors responsible for joint stability
- || Development of joints

## **CARDIOVASCULAR SYSTEM**

- || Definition
- || Division of circulatory system into pulmonary & systemic
- || Classification of blood vessels and their microscopic picture
- || Heart and its histology
- || Function of the Heart
- || Anastomosis

## **NERVOUS SYSTEM**

- || Definition
- || Outline of cellular architecture
- || Classification of nervous system
- || Parts of the central nervous system
- || Microscopic picture of cerebrum, cerebellum, spinalcord
- || Functional components of nerve
- || Typical spinal nerve
- || Microscopic picture of nerve
- || Introduction of autonomic nervous system
- || Anatomy of neuromuscular junction

## **GENERAL HISTOLOGY**

- || Cell
- || Epithelium
- || Connective tissue
- || Bone
- || Muscle tissue
- || Nerve tissues
- || Blood vessels
- || Skin and appendages
- || Lymphatic organs

## **GENERAL EMBRYOLOGY**

- || Male and female reproductive organs
- || Cell division and Gametogenesis
- || Fertilization, cleavage, blastocyte formation and implantation of the embryo. Stages of early embryonic development in second and third week of intrauterine life
- || Fetal membrane (amniotic cavity, yolk sac, allantois, umbilical cord and Placenta)
- || Developmental defects

## **UPPER LIMB OSTEOLOGY**

- || Detailed description of all bones of upper limb and shoulder girdle along their musculature and ligamentous attachments.

## **MYOLOGY**

- || Muscles connecting upper limb to the axial skeletal
- || Muscles around shoulder joint
- || Walls and contents of axilla
- || Muscles in brachial region
- || Muscles of forearm
- || Muscles of hand
- || Retinacula
- || Palmar aponeurosis
- || Flexor tendon dorsal digital expansion

## **NEUROLOGY**

- || Course, distribution and functions of all nerves of upper limb
- || Brachial plexus

## **ANGIOLOGY (CIRCULATION)**

- || Course and distribution of all arteries and veins of upper limb
- || Lymphatic drainage of the upper limb
- || Axillary lymph node
- || Cubital fossa

## **ARTHROLOGY**

- || Acromioclavicular and sternoclavicular joints
- || Shoulder joint
- || Elbow joint
- || Wrist joint
- || Radioulnar joints
- || Inter carpal joints
- || Joints MCP and IP
- || Surface anatomy of upper limb
- || Surface marking of upper limb

## DEMONSTRATION

- || Shoulder joint, attached muscles and articulating surfaces
- || Elbow joint
- || Wrist joint
- || Radioulnar joint
- || MCP and IP joints
- || Acromioclavicular joint
- || Sternoclavicular joint
- || Brachial plexus
- || Blood supply of brain
- || Structure of bones

## LAB WORK

During study of this course, emphasis should be given on applied aspects, practical histology, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester /year

### Note

The students are expected to make a practical note book. The book is a collection of evidence that learning has taken place. It is a reflective record of their achievements. The practical note book shall contain a record of the surface landmarks and cross-sectional views of parts which student would have observed

## RECOMMENDED BOOKS

1. Gray's Anatomy by Prof. Susan Standing 41<sup>st</sup> Ed., Elsevier.
2. Clinical Anatomy for Medical Students by Richard S. Snell.
3. Clinically Oriented Anatomy by Keith Moore.
4. General Anatomy by Prof.
5. Ghulam Ahmad, latest Ed.
6. Clinical Anatomy by R. J. Last, Latest Ed.
7. Cunningham's Manual of Practical Anatomy by G. J. Romanes, 15th Ed., Vol-I, II and III.
8. The Developing Human. Clinically Oriented Embryology by Keith L. Moore, 6th Ed.
9. Wheatear's Functional Histology by Young and Heath, Latest Ed.
10. Medical Histology by Prof. Laiq Hussain.
11. Neuroanatomy by Richard S. Snell 7<sup>th</sup> edition.
12. Jacques text book of histology
13. Colour atlas of histology by defiero
14. Langman's embryology
15. Clinically oriented developmental anatomy by Kilmore

**COURSE DESCRIPTION**

The course is designed to study the function of the human body at the cellular, tissue and systems levels. The course will help students in understanding the complexities of the cells, tissues, and major organs and systems of the human body, concentrating on basic mechanisms underlying human life processes and important diseases affecting normal human function

**COURSE EDUCATIONAL OBJECTIVES:**

At the end of the semester students should be able to

1. Describe the functional organization of human body and its structural and functional unit
2. Develop detailed concepts of physiological aspects of the musculoskeletal system along with its clinical importance
3. Comprehend the composition of blood and its components along with the methods of visualizing and computing them using physiological knowledge

**COURSE LEARNING OBJECTIVES:**

1. Describe the functional organization of the human body.
2. Explain the concept of homeostasis and physiological control systems
3. Differentiate between positive and negative feedback systems with examples
4. Briefly explain the physical structure and organization of cell.
5. Describe the structure and functions of a typical cell membrane
6. Define an organelle and discuss briefly the details of structure and functions of each organelle
7. Explain briefly the structure and properties of nerve fiber
8. Classify nerve fibers on the basis of conduction velocity, diameter, and myelination
9. Discuss how resting membrane potential is established and maintained
10. Explain different stages of the generation of action potential in nerve fiber
11. Define synapses and classify their types
12. Describe the neuromuscular junction and its disorders
13. Discuss the process of nerve degeneration and regeneration
14. Describe the mechanism of skeletal muscle contraction with special reference to sliding filament theory
15. Discuss smooth muscle contraction.
16. Describe the composition and function of blood & plasma proteins
17. Define erythropoiesis and describe its various stages
18. Discuss the structure and function of RBCs and RBC indices
19. Discuss hemoglobin and its types.
20. Explain iron metabolism, synthesis, and the degradation of hemoglobin.
21. Define anemia and classify its various causes and treatment
22. Define white blood cells and classify its types
23. Define immunity. Classify its various types in detail
24. Describe the characteristic features of blood platelets

25. Define hemostasis and describe extrinsic and intrinsic pathways of blood coagulation
26. Describe various types of blood groups
27. Discuss blood transfusion and blood transfusion reactions
28. Discuss reticuloendothelial system, its development and functions.

## **COURSE CONTENTS CELL**

### **PHYSIOLOGY**

- || Functional organization of human body
- || Homeostasis
- || Control systems in the body
- || Cell membrane and its functions
- || Cell organelles and their functions
- || Genes: control and function

### **NERVE AND MUSCLE**

- || Structure and function of neuron
- || Physiological properties of nerve fibers
- || Action potential
- || Conduction of nerve impulse
- || Nerve degeneration and regeneration
- || Synapses
- || Physiological structure of muscle
- || Skeletal muscle contraction
- || Skeletal, smooth and cardiac muscle contraction
- || Neuromuscular junction and transmission
- || Excitation contraction coupling
- || Structure and function of motor unit

### **BLOOD**

- || Composition and general functions of blood
- || Plasma proteins their production and function
- || Erythropoiesis and red blood cell function
- || Structure, function, production and different types of hemoglobin
- || Iron absorption storage and metabolism
- || Blood indices, Function, production and type of white blood cells
- || Function and production of platelets
- || Clotting mechanism of blood
- || Blood groups and their role in blood transfusion
- || Complications of blood transfusion with reference to ABO & RH incompatibility
- || Components of reticuloendothelial systems, gross and microscopic structure including tonsil, lymph node and spleen
- || Development and function of reticuloendothelial system

## LAB WORK

- || Use of the microscope
- || Determination of hemoglobin
- || Determination of erythrocyte sedimentation rate
- || Determining packed cell volume
- || Measuring bleeding and clotting time
- || RBC count
- || Red cell indices
- || WBC count
- || Leukocyte count
- || Prothrombin and thrombin time.
- || Blood indices in various disorders
- || Clotting disorders
- || Blood grouping and cross matching

## Note

The students are expected to make a practical note book. The book is a collection of evidence that learning has taken place. It is a reflective record of their achievements

## RECOMMENDED BOOKS

1. Textbook of Physiology by Guyton and Hall, 12<sup>th</sup> Ed.
2. Review of Medical Physiology by William F. Ganong, 23<sup>rd</sup> Ed.
3. Physiology by Berne and Levy, 6<sup>th</sup> Ed.
4. Human Physiology: The Basis of Medicine by Gillian Pocock, Christopher D Richards 4<sup>th</sup> Ed.
5. Physiological Basis of Medical Practice by John B. West and Taylor, 12<sup>th</sup> Ed.

**COURSE DESCRIPTION**

Course covers the principles of mechanics and anatomy in relation to human movement facilitating students to apply kinesiological evaluation and treatment of muscular imbalance or derangement in their clinical practice. It consists of evaluation of muscular function and group movements of muscle in relation to force of gravity and manual resistance. By becoming familiar with the knowledge of basic mechanical and physiological mechanisms, students will be more confident and competent in using them in use of exercises to promote physical rehabilitation

**COURSE OUTCOMES**

At the end of the semester students should be able to

1. Describe the mechanics of movement
2. Develop the concepts of rehabilitation and re-education

**LEARNING OBJECTIVES:**

1. Define the mechanical principles and their application on the human body
2. Describe the concept of movement and how it occurs in the body
3. Demonstrate fundamental position, their effects and uses
4. Explore fundamental skills to differentiate between good and bad posture and demonstrate the technique for re-education
5. Develop critical thinking abilities in students to determine which technique to select in a specific case, suitable for its rehabilitation
6. Describe muscular anatomy, its function against gravity and manual resistance.

**COURSE CONTENT'S****INTRODUCTION TO KINESIOLOGY**

- ☐ Definition of Physical Therapy and Rehabilitation
- ☐ Definition of kinesiology

**MECHANICS**

- ☐ Mechanical Principles and Mechanics of Position
- Force - force system – Description of units
- ☐ Gravity: Center of gravity and line of gravity
- ☐ Level of gravity
- ☐ Equilibrium
- ☐ Fixation and Stabilization
- ☐ Mechanics of movement
- ☐ Axes / Planes
- ☐ Speed
- ☐ Velocity
- ☐ Acceleration



- Inertia
- Friction
- Lever - types – application in humanbody
- Pulley - types – application in humanbody
- Angle of pull

## **INTRODUCTION TO MOVEMENT**

- || Types of movement and posture
- || Patterns of movement
- || Timing in movement
- || Rhythm of movement
- || The nervous control of movement

## **STARTING POSITIONS**

- || Definition
- || Fundamental positions
- || Standing
- || Kneeling
- || Sitting
- || Lying
- || Hanging
- || The pelvic tilt

## **POSTURE**

- || Active postures
- || The postural mechanism
- || The pattern of posture
- || Principles of Re- Education
- || Techniques of Re-Education
- || Prevention of muscles wasting
- || The initiation of muscular contraction
- || Abnormal postures
- || Momentum of muscle wasting
- || The initiation of muscular contraction
- || Abnormal postures

## **MUSCLE STRENGTH AND MUSCLE ACTION**

- || Types of Muscles contraction
- || Muscles tone
- || Physiological application to postural tone
- || Group action of muscles
- || Overview of muscle structure
- || Types of muscle work
- || Range of muscle work
- || Two joint muscle work

- || Active and passive insufficiency
- || Group movement of joints
- || Muscular weakness and paralysis

## **LAB WORK**

- || Fundamentals of muscle testing
- || Methods of muscle recording
- || Basic muscle grading system
- || Evaluation of posture
- || Regional upper limb muscle testing
- || Practical demonstrations of muscles work and its ranges
- || Practical demonstrations of various fundamental positions and posture analysis.

## **Note**

The students are expected to make a practical notebook. The practical notebook is a collection of evidence that learning has taken place and also a reflective record of student's achievements

## **RECOMMENDED BOOKS**

1. Practical exercise therapy by Margaret Hollis 3<sup>rd</sup> Ed. illustrated, reprint, Blackwell Scientific
2. Brannstrom's Clinical Kinesiology 6<sup>th</sup> Ed. By Peggy A Houghlum, Dolores B Bertoti
3. Clinical kinesiology and anatomy 5<sup>th</sup> Ed. by Lynn S Lippert
4. Joint structure and function: a comprehensive analysis 5<sup>th</sup> Ed. by: Pamela. K. Levangie and Cynthia. C. Norkin.
5. Muscle function testing by: Cunningham and Daniel. 2nd, illustrated
6. Human movement explain by kimjonas and karenbaker
7. The principles of exercise therapy by: M. Dena Gardiner, 4<sup>th</sup> Edition

## **ENGLISH-I**

### **(FUNCTIONAL ENGLISH):**

#### **Course Objectives:**

At the end of the semester students should be able to

1. Enhanced their language skills and developed critical thinking
2. Enabled students to meet their practical communication needs

#### **COURSE LEARNING OBJECTIVES:**

1. Apply the basic rules of grammar in their oral and written communication
2. Formation of different types of sentence structures
3. Comprehend the given reading and listening exercises
4. Translate assigned texts from Urdu to English
5. Build up their presentation skills.

#### **COURSE CONTENTS**

- || Basics of Grammar
- || Parts of speech and use of articles
- || Sentence structure, active and passive voice
- || Practice in unified sentence
- || Analysis of phrase, clause, and sentence structure
- || Transitive and intransitive verbs
- || Punctuation and spelling.

#### **COMPREHENSION**

- || Answers to questions on a given text.

#### **DISCUSSION**

- || General topics and every-day conversation (topics for discussion to be at the discretion of the teacher keeping in view the level of students)

#### **LISTENING**

- || To be improved by showing documentaries/films carefully selected by subject teachers

#### **TRANSLATION SKILLS**

- || Urdu to English Paragraph writing

## **Topics to be chosen at the discretion of the teacher Presentation skills.**

|| Introduction

### **Note**

Extensive reading is required for vocabulary building.

## **RECOMMENDED BOOKS**

### **Functional English Grammar**

1. Practical English Grammar by A. J. Thomson and A. V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0194313492
2. Practical English Grammar by A. J. Thomson and A. V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN 0194313506

### **Writing**

1. Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
2. Reading/Comprehension
3. Reading. Upper Intermediate. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.

# PAKISTAN STUDIES

CREDIT HOURS 2(2-0)

## COURSE EDUCATIONAL OBJECTIVES:

At the end of the semester students should be able to

1. Demonstrate their awareness of Pakistan in the 21<sup>st</sup> Century.
2. Articulate knowledge of Pakistan's history and geography.
3. Understand Pakistan's society and economy.
4. Analyze Pakistan's foreign policy.
5. Critically assess Pakistan's past and its future direction

## COURSE LEARNING OBJECTIVES:

1. Interpret the history of Pakistan.
2. Identify the geography of Pakistan.
3. Display knowledge of the demographics, features and structures of Pakistani society.
4. Appraise the foreign relations of Pakistan.

## COURSE CONTENT

### HISTORICAL PRESPECTIVE

- || Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-e-Azam Muhammad Ali Jinnah
- || Factors leading to Muslim separatism.

### PEOPLE AND LAND

- Indus Civilization •• Muslim advent
- || Location and geo-physical features

### GOVERNMENT AND POLITICS IN PAKISTAN

- || 1947-58
- 1958-71
- || 1971-77

- 1977-88
- || 1988-99
- || 1999 onward

## CONTEMPORARY PAKISTAN

- || Economic institutions and issues
- || Society and social structure
- || Ethnicity
- || Foreign policy of Pakistan and challenges
- || Futuristic outlook of Pakistan

## RECOMMENDED BOOKS

1. Burki, Shahid Javed. State & Society in Pakistan, The Macmillan Press Ltd 1980.
2. Akbar, S. Zaidi. Issue in Pakistan's Economy. Karachi: Oxford University Press, 2000.
3. S. M. Burke and Lawrence Ziring. Pakistan's Foreign policy: An Historical analysis. Karachi: Oxford University Press, 1993.
4. Mehmood, Safdar. Pakistan Political Roots & Development. Lahore, 1994.
5. Wilcox, Wayne. The Emergence of Bangladesh., Washington: American Enterprise, Institute of Public Policy Research, 1972.
6. Mehmood, Safdar. Pakistan Kayyun Toota, Lahore: Idara-e-Saqafat-e-Islamia, Club Road, nd.
7. Amin, Tahir. Ethno - National Movement in Pakistan, Islamabad: Institute of Policy Studies, Islamabad.
8. Ziring, Lawrence. Enigma of Political Development. Kent England: Wm Dawson & sons Ltd, 1980.
9. Zahid, Ansar. History & Culture of Sindh. Karachi: Royal Book Company, 1980.
10. Afzal, M. Rafique. Political Parties in Pakistan, Vol. I, II & III. Islamabad: National Institute of Historical and cultural Research, 1998.
11. Sayeed, Khalid Bin. The Political System of Pakistan. Boston: Houghton Mifflin, 1967.
12. Aziz, K.K. Party, Politics in Pakistan, Islamabad: National Commission on Historical and Cultural Research, 1976.
13. Muhammad Waseem, Pakistan under Martial Law, Lahore: Vanguard, 1987.
14. Haq, Noor ul. Making of Pakistan: The Military Perspective. Islamabad: National Commission on Historical and Cultural Research, 1993.

## **INTRODUCTION TO COMPUTERS**

**CREDIT HOURS: 3(2-1)**

### **COURSE DESCRIPTION**

This is an introductory course on Information and Communication Technologies. Topics include ICT terminologies, hardware and software components, the internet and World Wide Web, and ICT based applications.

### **INTRODUCTION TO COMPUTER:**

#### **COURSE EDUCATIONAL OBJECTIVES:**

At the end of the semester students should be able to

1. Understand different terms associated with ICT, enabling/pervasive features of ICT, different terms associated with the Internet and World Wide Web
2. Identify various components of a computer system, categories of software and their usage
3. Use various web tools including web browsers, e-mail clients and search utilities, text processing, spreadsheets and presentation tools
4. Define the basic terms associated with communications and networking

#### **COURSE LEARNING OBJECTIVES:**

1. Identify the components of a computer system
2. Demonstrate basic proficiency on a computer
3. Use of commonly used computer applications
4. Explain the fundamentals of operating systems
5. Analysing databases and types of databases
6. Learning about computer networks and internet
7. Developing their skills set for Microsoft office applications

## COURSE CONTENTS

	Basic Definitions & Concepts
	Hardware: Computer Systems & Components
	Storage Devices , Number Systems
	Software: Operating Systems, Programming and Application Software
	Introduction to Programming, Databases and Information Systems
	Networks
	Data Communication
	The Internet, Browsers and Search Engines
	The Internet: Email, Collaborative Computing and Social Networking
	The Internet: E-Commerce
	IT Security and other issues
	ProjectWeek
	Review Week

## RECOMMENDED BOOKS

1. Introduction to Computers by Peter Norton, 6th International Edition (McGraw HILL)
2. Using Information Technology: A Practical Introduction to Computer & Communications by Williams Sawyer, 6th Edition (McGraw HILL)
3. Computers, Communications & information: A user's introduction by Sarah E. Hutchinson, Stacey C. Swayer
4. Fundamentals of Information Technology by Alexis Leon, Mathewsleon Leon press.



## SECOND SEMESTER

Sr.No.	Course Title	Credit Hours
1	ANATOMY -II (Theory) ANATOMY -II (Practical)	4(3-1)
2	PHYSIOLOGY-II (Theory) PHYSIOLOGY-II (Practical)	3(2-1)
3	KINESIOLOGY-II (Theory) KINESIOLOGY-II (Practical)	3(2-1)
4	ENGLISH-II (COMMUNICATION SKILLS)	3(3-0)
5	ISLAMIC STUDIES / ETHICS	2(2-0)
6	SOCIOLOGY	2(2-0)
7	CIVIL SOCIETY AND DEVELOPMENT	2(2-0)
8	UNDERSTANDING QURAN-I	Non CH 1 hour/week
<b>Total Credit Hours</b>		19

**COURSE DESCRIPTION**

The focus of this course is an in-depth study and analysis of the regional and systemic organization of the body. Emphasis is placed upon structure and function of human movement. A comprehensive study of human anatomy with emphasis on the nervous, musculoskeletal and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in manikins/smart board systems supplemented with the study of charts, models, prosected materials and radiographs are utilized to identify anatomical landmarks and configurations of the lower limb, abdomen and pelvis

**Course Outcomes:**

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

1. Explain the bones, ligaments, joints, muscles and neurovascular supply of lower limb
2. Explain the superficial fascia, muscles, cutaneous nerves, vessels and lymphatics of abdominal wall
3. Categorize the structural organization of GIT and explain the structure and functions of abdominal viscera
4. Identify the bony features of pelvis and the muscles forming the pelvic floor

**Course Learning Objectives:**

1. Demonstrate the general features and attachments of hip bone, femur, tibia, fibula and bones of foot.
2. Identify the boundaries of greater and lesser sciatic foramina and structures passing through them.
3. Explain the muscles and neurovascular supply of the gluteal region
4. Describe the muscular compartments of thigh and their neurovascular supply
5. Describe the boundaries and contents of the femoral triangle, saphenous opening and adductor canal
6. Describe the formation of Lumbosacral plexus with its branches
7. Describe the hip joint, knee joint, superior and inferior tibiofibular joint, ankle joint and small joints of foot in the light of articulating bones, type, ligaments, muscles and movements
8. Relate the neurovascular supply and actions of muscles of anterior, lateral and posterior compartment of leg with their clinical correlates
9. Enumerate the structures forming the boundaries of popliteal fossa and its contents
10. Describe the extent, branches and tributaries of popliteal vessels
11. Discuss the attachment of flexor retinaculum and superior and inferior extensor retinacula and structures passing deep to them with clinical correlates
12. Describe the extent and branches of posterior & anterior tibial artery
13. Explain the course, extent and tributaries of long and short saphenous vein

14. Enlist the muscle layers of foot with their functional anatomy
15. Describe the arches of foot
16. Describe the development of limbs
17. Demonstrate the surface anatomy of the following structures on a standardized patient
  - a) Popliteal artery
  - b) Plantar arch
  - c) Superficial and deep perineal nerve
  - d) Tibial nerve
  - e) Superior and inferior extensor retinacula
  - f) Flexorretinaculum
  - g) Dorsalis pedis artery
18. Interpret the radiographs of lower limb
19. Explain the superficial fascia, cutaneous nerves, blood and lymphatic vessels of anterior and posterior abdominal walls
20. Define the muscles of the anterior and posterior abdominal walls
21. Describe the nine regions and surface landmarks of abdomen
22. Categorize the structural organization of GIT
23. Identify the different lumbar vertebrae on the basis of their features
24. Explain the gross features of stomach, small intestine, large intestine, liver, gallbladder and pancreas
25. Explain gross features of urinary system
26. Identify the bony features of pelvis and the muscles forming the pelvic floor
27. Explain gross features of perineum and its divisions
28. Explain superficial and deep perineal pouches
29. Identify male and female reproductive organs

## **COURSE CONTENTS**

### **LOWER LIMB OSTEOLOGY**

- Detailed description of all bones of lower limb and pelvis along with their markings

### **MYOLOGY**

- || Muscles of gluteal region
- || Muscles around hip joint
- || Muscles of thigh
- || Muscles of lower leg and foot

### **NEUROLOGY**

- || Course, distribution, supply of all nerves of lower limb and gluteal region
- || Lumbosacral plexus

## **ANGIOLOGY**

- || Course and distribution of all arteries, veins and lymphatic drainage of lower limb

## **ARTHROLOGY**

- || Pelvis
- || Hip joint
- || Knee joint
- || Ankle joint
- || Joints of the foot
- || Surface Anatomy of lower limb
- || Surface Marking of lower limb

## **ABDOMEN**

### **ABDOMINAL WALL**

- || Structures of anterior abdominal wall: superficial and deep muscles
- || Structure of rectus sheath
- || Structures of Posterior abdominal wall
- || Lumbar spine (vertebrae)
- || Brief description of viscera

### **PELVIS**

- || Brief description of anterior, posterior and lateral walls of the pelvis
- || Inferior pelvic wall or pelvic floor muscles
- || Sacrum
- || Brief description of perineum
- || Nerves of perineum

## **EMBRYOLOGY**

- || Introduction to developing human
- || Gametogenesis, Spermatogenesis, Oogenesis
- || Fertilization and phases of fertilization
- || Germ layers
- || Development of limbs, Muscular system and Nervous system

## LAB WORK

During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester /year.

### Note

The students are expected to make a practical note book. The book is a collection of evidence that learning has taken place. It is a reflective record of their achievements

## RECOMMENDED BOOKS

1. Gray's Anatomy by Prof. Susan Standing 41<sup>st</sup> Ed., Elsevier.
2. Clinical Anatomy for Medical Students by Richard S. Snell.
3. Clinically Oriented Anatomy by Keith Moore.
4. General Anatomy by Prof. Ghulam Ahmad, latest Ed.
5. Clinical Anatomy by R. J. Last, Latest Ed.
6. Cunningham's Manual of Practical Anatomy by G. J. Romanes, 15th Ed., Vol-I, II and III.
7. The Developing Human. Clinically Oriented Embryology by Keith L. Moore, 6th Ed.
8. Wheater's Functional Histology by Young and Heath, Latest Ed.
9. Medical Histology by Prof. Laiq Hussain.
10. Neuroanatomy by Richard S. Snell 7<sup>th</sup> edition.
11. Jancquera textbook of histology
12. Colour atlas of histology by defiero
13. Langman's embryology
14. Clinically oriented developmental anatomy by k.l.moore

## **PHYSIOLOGY- II**

**CREDIT HOURS 3(2-1)**

### **COURSE DESCRIPTION**

The course is designed to study the function of the human body at the molecular, cellular, tissue and systems levels. These topics are addressed by a consideration of the cardiovascular, gastrointestinal, and endocrinological systems. The integrative nature of physiological responses in normal function and disease is stressed throughout the course

### **Course Outcomes:**

At the end of the semester students should be able to

1. Describe in detail the physiology of the heart and circulatory system and demonstrate related examination
2. Describe the physiology of the GI tract and mechanisms involved in its regulation and maintenance
3. Develop the concept of endocrinology and enumerate different hormones and their mechanism of actions and functions

### **COURSE LEARNING OBJECTIVES:**

1. Describe the functional organization/lay-out of the cardiovascular system
2. Explain the cardiac action potential and spread of impulse through different chambers of the heart
3. Enumerate different heart sounds and describe the mechanism for the production of these heart sounds
4. Define ECG. Discuss its various intervals and segments along with its physiological basis
5. Describe various leads of ECG
6. Define hemodynamics and explain laws governing the flow of blood through blood vessel wall
7. Define microcirculation. Elaborate upon the forces of the capillary membrane at the arterial and venous end
8. Define cardiac output and venous return. Enumerate the factors affecting cardiac output and venous return
9. Define blood pressure and discuss the mechanisms regulating it
10. Define the cardiac cycle. Explain its phases with a suitable diagram. Describe functional organization of the gastrointestinal tract
11. Explain the different characteristics features of GI smooth muscles
12. Discuss the enteric nervous system
13. Discuss the properties, functions, regulation and applied aspects of salivary secretion
14. Enumerate GIT secretions and explain the mechanism which synthesis secretion and its regulation
15. Discuss GIT motility and its reflexes
16. Discuss the phases of swallowing and the swallowing reflex in detail

17. Discuss the stages of vomiting and the vomiting reflex in detail
18. Describe the functions of the liver and gall bladder
19. Discuss the mechanism for the synthesis of pancreatic secretions and their regulation
20. Explain the functions of the stomach's small and large intestine
21. Discuss GI disorders
22. Define endocrine secretions and enumerate the different hormones and their action mechanism
23. Describe the hormones produced by the hypothalamus and pituitary gland
24. Discuss the parathyroid hormones and calcium metabolism
25. Describe the functions of thyroid hormones and their disorders
26. Describe the functions of adrenal cortical hormones and their disorders
27. Describe the functions of the adrenal medullary hormones and their disorders
28. Discuss the endocrine functions of the pancreas and its disorders.

## **COURSE CONTENTS**

### **GASTROINTESTINAL TRACT**

- || General function of gastrointestinal tract
- || Enteric nervous system
- || Control of gastrointestinal mobility and secretions
- || Mastication
- || Swallowing: mechanism and control
- || Function, motility and secretions of stomach
- || Function, motility and secretions of small intestine
- || Function, motility and secretions of large intestine
- || Function of GIT hormones
- || Mechanism of vomiting and its control pathway
- || Defecation and its control pathway
- || Functions of liver
- || Functions of, gallbladder and bile in digestion
- || Endocrine & exocrine pancreas and functions of pancreas in digestion
- || Dysphagia
- || Physiological basis of acid peptic disease

### **CARDIOVASCULAR SYSTEM**

- || Heart and circulation
- || Function of cardiac muscle
- || Cardiac pacemaker and cardiac muscle contraction
- || Cardiac cycle
- || ECG: recording and interpretation
- || Common arrhythmias
- || Types of blood vessels and their function
- || Haemodynamics of blood flow (local control, systemic circulation its regulation and control). Peripheral resistance its regulation and effect on circulation

- || Arterial pulse
- || Blood pressure and its regulation
- || Cardiac output and its control
- || Heart sounds and murmurs Importance in circulation and control of venous return.
- || Coronary circulation
- || Splanchnic, pulmonary and cerebral circulation
- || Triple response and cutaneous circulation

## **ENDOCRINOLOGY**

- || Classification of endocrine glands
- || Mechanism of action
- || Feedback and control of hormonal secretion
- || Functions of the hypothalamus
- || Hormones secreted by the anterior and posterior pituitary and their mechanism of action and function.
- || Function of the thyroid gland
- || Function of the parathyroid gland
- || Calcium metabolism and its regulation
- || Secretion and function of calcitonin
- || Hormones secreted by the adrenal cortex and medulla, and their function and mechanism of action
- || Endocrine functions of the pancreas and control of blood sugar
- || The endocrine functions of the kidney and Physiology of growth.

## **LAB WORK**

- || Clinical significance of cardiac cycle, correlation of ECG and heart sounds
- || Examination of arterial pulses
- || Arterial blood pressure
- || Effects of exercise and posture on blood pressure
- || Cardiopulmonary resuscitation (to be coordinated with the department of medicine)

### **Note**

The students are expected to make a sketch book. The sketch book is a collection of evidence that learning has taken place. It is a reflective record of achievements

### **RECOMMENDED BOOKS**

1. Textbook of Physiology by Guyton and Hall, 12<sup>th</sup> Ed.
2. Review of Medical Physiology by William F. Ganong, 23<sup>rd</sup> Ed.
3. Physiology by Berne and Levy, 6th Ed.
4. Human Physiology: The Basis of Medicine by Gillian Pocock, Christopher D. Richards 4<sup>th</sup> Ed.
5. Physiological Basis of Medical Practice by John B. West and Taylor, 12th Ed.



## KINESIOLOGY-II

CREDIT HOURS 3(2-1)

### COURSE DESCRIPTION

The course covers the types of human motions in relation to axes and planes. It further explores the inter-relationship among kinematic variables and motion analysis

### Course Outcomes:

At the end of the semester students should be able to

1. Describe their range of motion
2. Understand the relationship between kinematic and kinetics

### Course Learning Objectives:

1. Describe the ROM and types of movements and exercises
2. Differentiate among agonists, antagonists, and synergists integrating the knowledge learned with human motion occurring during daily activities
3. Demonstrate relaxation techniques, derived positions, and effective use of walking aids
4. Demonstrate coordinated and uncoordinated movements.

## COURSE CONTENTS

### TYPES OF MOVEMENT & EXERCISES

- || Voluntary & involuntary movements
- || Active and Passive movements
- || Classification & techniques of free exercises
- || The principles, techniques and effects of assisted exercises
- || The principles, techniques and effects of assisted resisted exercises
- || The principles, types, techniques and effects of resisted exercises
- || Variation of the power of the muscles in different parts of their range
- || Progressive Resistance Exercise
- || Reflex movement
- || The reflex arc
- || The stretch reflex
- || The righting reflexes
- || The postural reflexes
- || Effects and uses of reflex movement

### PASSIVE MOVEMENT

- || The principles, types, techniques and effects of passive exercises
- || Definition of Passive manual mobilization and manipulations

- || Controlled sustained stretching, Principles and Effects and uses

## **RELAXATION**

- || Definition
- || Muscle tone
- || Postural tone
- || Voluntary movement
- || Mental attitudes
- || Degrees of relaxation
- || Pathological tension in the muscles
- || Technique
- || General relaxation
- || Local relaxation

## **DERIVED POSITIONS**

- || Purpose of derived positions
- || Positions derived from standing by alteration of arms, legs and trunk.
- || Positions derived from kneeling.
- || Positions derived from sitting by alteration of the legs& by alteration of trunk
- || Positions derived from lying, by alteration of arms and by alteration of the legs.
- || Positions derived from hanging.
- || Other positions in which some of the weight is taken on the arms.

## **SUSPENSION THERAPY**

- || Suspension application
- || Suspension concept of inclined planes
- || The fixed point suspension
- || Supporting rope and its types
- || Sling and its types
- || Type of suspension: axial & vertical
- || Methods, techniques of suspension: upper limb & lower limb
- || Suspension effect on muscle work and joint mobility

## **NEUROMUSCULAR CO-ORDINATION**

- || Coordinated movement
- || Group action of muscles
- || Nervous control
- || Inco-ordination
- || Re-Education
- Frenkel's exercises.

## **WALKING AIDS**

- || Crutches
- || Sticks
- || Tripod or Quadra pod

- || Frames

## **LAB WORK**

- || Demonstrations of the techniques of active, passive movements
- || Demonstrations of relaxation procedures
- || Demonstrations of various derived positions
- || PRE program
- || Manual muscle testing - Regional Lower limb muscle testing

## **Note**

The students are expected to make a practical note book. The book is a collection of evidence that learning has taken place. It is a reflective record of their achievements

## **RECOMMENDED BOOKS**

1. Practical exercise therapy by Margaret Hollis 3<sup>rd</sup> Ed. illustrated, reprint, Blackwell Scientific
2. Brunnstrom's Clinical Kinesiology 6<sup>th</sup> Ed. By. Peggy A. Houglum, Dolores B. Bertoti
3. Clinical kinesiology and anatomy 5<sup>th</sup> Ed. by Lynn S Lippert
4. Joint structure and function: a comprehensive analysis 5<sup>th</sup> Ed. by: Pamela. K. Levangie and Cynthia. C. Norkin.
5. Muscle function testing by: Cunningham and Daniel. 2nd, illustrated
6. Human movement explain by kimjonas and karenbaker
7. The principles of exercise therapy by: M. Dena Gardiner, 4<sup>th</sup> Edition.

## **ENGLISH-II (COMMUNICATION SKILLS): CREDIT HOURS 3(3-0)**

### **Course Outcomes:**

At the end of the semester students should be able to

1. Read, write and listen in at an enhanced skill level in English
2. Enable the students to meet their real-life communication needs
3. Enhance language skills and develop critical thinking
4. Develop personality building via presentation skills

### **Course Learning Objectives:**

1. Compose a unified and coherent paragraph
2. Categorize different types of essays
3. Comprehend reading exercises
4. Write well formatted letters, memos, CV's, job applications and minutes of meetings
5. Translate a given text from Urdu to English
6. Review documentaries for further evaluation
7. Build up presentation skills.

### **COURSE CONTENTS**

#### **Paragraph writing**

- || Practice in writing a good, unified and coherent paragraph

#### **Essay writing**

- || Introduction

#### **CV and job application**

- || Translation skills
- || Urdu to English

#### **Study skills**

- || Skimming and scanning, intensive and extensive, and speed reading
- Summary and précis writing and comprehension

#### **Academic skills**

Letter/memo writing, minutes of meetings, use of library and internet

#### **Presentation skills**

Personality development (emphasis on content, style, and pronunciation)

## **Note**

Documentaries to be shown for discussion and review.

## **RECOMMENDED BOOKS**

### **Communication Skills**

#### **Grammar**

1. Practical English Grammar by A. J. Thomson and A. V. Martinet. Exercises
2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.

#### **Writing**

1. Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Françoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 45-53 (note taking).
2. Writing. Upper-Intermediate by Rob Nolasco. Oxford Supplementary Skills. Fourth Impression 1992. ISBN 0 19 435406 5 (particularly good for writing memos, introduction to presentations, descriptive and argumentative writing).

#### **Reading**

1. Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 453403 0.
2. Reading and Study Skills by John Langan
3. Study Skills by Richard Yorky.

## ISLAMIC STUDIES/ETHICS:

CREDIT HOURS2(2-0)

### Course Outcomes:

At the end of the semester students should be able to

1. Understand basic concept of Islam (faith, pillars and systems etc.) and express their impact on society
2. Introduce Islam as complete code of life and reflect Islamic Ethics in their conduct
3. Recognize the central role of the unique concept of religion in Islam
4. Evaluate the commonly perpetuated misconceptions of Islam

### Course Learning Objectives:

1. Strengthen the knowledge of students about Islam and build their character
2. Enhance the understanding of students regarding Islamic history and Civilization
3. Develop an attitude of total submission to Allah's divine revelation and to discern the validity of teachings, practices, and/or cultural adaptations through proper research and comparison with authentic sources, namely the Qur'an and Sunnah
4. Understand that Islam is a comprehensive, balanced, and perfect way of life; to learn foundational Islamic beliefs, ideals, ethics, obligations, injunctions, and prohibitions; and to gain whatever knowledge is necessary to live a God-conscious life.

## COURSE CONTENTS

### INTRODUCTION TO QURANIC STUDIES

- || Basic Concepts of Quran
- || History of Quran
- Uloom-ul –Quran.

### STUDY OF SELECTED TEXT OF HOLLY QURAN

- ☐ Verses of Surah Al-Baqra Related to Faith (Verse No-284-286)
- ☐ Verses of Surah Al-Hujrat Related to Adab Al-Nabi (Verse No-1-18)
- ☐ Verses of Surah Al-Mumanoon Related to Characteristics of faithful (Verse No-1-11)
- ☐ Verses of Surah al-Furqan Related to Social Ethics (Verse No.63-77)
- ☐ Verses of Surah Al-Inam Related to Ihkam (Verse No-152-154).

### STUDY OF SELECTED TEXT OF HOLLY QURAN

- || Verses of Surah Al-Ihzab Related to Adab al-Nabi (Verse No.6,21,40,56,57,58)
- || Verses of Surah Al-Hashar (18,19,20) Related to thinking, Day of Judgment
- || Verses of Surah Al-Saf Related to Tafakar,Tadabar (Verse No-1,14).

## **SEERAT OF HOLY PROPHET (S.A.W) I**

- || Life of Muhammad Bin Abdullah (Before Prophet Hood)
- || Life of Holy Prophet (S.A.W) in Makkah
- || Important Lessons derived from the life of Holy Prophet in Makkah.

## **SEERAT OF HOLY PROPHET (S.A.W) II**

- || Life of Holy Prophet (S.A.W) in Madina
- || Important Events of Life Holy Prophet in Madina
- || Important Lessons derived from the life of Holy Prophet in Madina.

## **INTRODUCTION TO SUNNAH**

- || Basic Concepts of Hadith
- || History of Hadith
- || Kinds of Hadith
- Uloom-ul-Hadith
- || Sunnah& Hadith
- || Legal Position of Sunnah.

## **SELECTED STUDY FROM TEXT OF HADITH**

## **INTRODUCTION TO ISLAMIC LAW & JURISPRUDENCE**

- || Basic Concepts of Islamic Law & Jurisprudence
- || History & Importance of Islamic Law & Jurisprudence
- || Sources of Islamic Law & Jurisprudence
- || Nature of Differences in Islamic Law
- || Islam and Sectarianism.

## **ISLAMIC CULTURE & CIVILIZATION**

- || Basic Concepts of Islamic Culture & Civilization
- || Historical Development of Islamic Culture & Civilization
- || Characteristics of Islamic Culture & Civilization
- || Islamic Culture & Civilization and Contemporary Issues.

## **ISLAM & SCIENCE**

- || Basic Concepts of Islam & Science
- || Contributions of Muslims in the Development of Science
- || Quranic& Science.

## **ISLAMIC ECONOMIC SYSTEM**

- || Basic Concepts of Islamic EconomicSystem

- || Means of Distribution of wealth in Islamic Economics
- || Islamic Concept of Riba
- || Islamic Ways of Trade & Commerce.

## **POLITICAL SYSTEM OF ISLAM**

- || Basic Concepts of Islamic PoliticalSystem
- || Islamic Concept of Sovereignty
- || Basic Institutions of Govt. in Islam.

## **ISLAMIC HISTORY**

- || Period of Khlaft-E-Rashida
- || Period of Ummayyads
- || Period of Abbasids

## **SOCIAL SYSTEM OF ISLAM**

- || Basic Concepts of Social System of Islam
- || Elements of Family
- || Ethical Values of Islam.

## **RECOMMENDED BOOKS**

1. Hameed ullah Muhammad, "Emergence of Islam" , IRI, Islamabad
2. Hameed ullah Muhammad, "Muslim Conduct of State"
3. Hameed ullah Muhammad, =Introduction to Islam
4. Mulana Muhammad YousafIslahi,"
5. Hussain Hamid Hassan, "An Introduction to the Study of Islamic Law" leaf Publication Islamabad, Pakistan.
6. Ahmad Hasan, "PrinciplesofIslamic Jurisprudence" Islamic Research Institute, International Islamic University, Islamabad (1993)
7. Mir Waliullah, "Muslim Jrisprudence and the Quranic Lawof Crimes" Islamic Book Service (1982)
8. H. S. Bhatia, "Studies in Islamic Law, Religion and Society" Deep & Deep Publications, New Delhi (1989)
9. Dr.Muhammad Zia-ul-Haq, "Introductionto Al Sharia Al Islamia" Allama Iqbal Open University, Islamabad (2001)



## **SOCIOLOGY**

**CREDIT HOURS: 2(2-0)**

### **COURSE DESCRIPTION**

The course focuses at providing basic concepts and models of health sciences. The psycho-socio and cultural assessment of health seeking behavioral patterns and the role of therapeutic management group will be examined. The indigenous healing system and contemporary medical system will be studied. It makes them realize the importance of the relationship of the physical therapist and the patient.

### **Course Outcomes:**

At the end of the semester students should be able to

1. Assess the psycho-social and cultural aspect of health seeking behavioral patterns and the role of therapeutic management
2. Study indigenous healing systems and the contemporary medical system
3. Realize in the students, the significance of the relationship between the physical therapist and the patient.

### **Course Learning Objectives:**

1. Demonstrate basic concepts and models of health sciences as well as giving a basic knowledge of diseases
2. Comprehend the basic knowledge and concepts of sociology
3. Identify the relationship and impact of groups, culture and environment on the illness behavior, perceptions of illness and the health of patients
4. Describe the social aspects of health and illness, as well as emphasize the importance of the relationship of the physical therapist with the patient, along with critical perspectives on contemporary issues in health
5. Discover sociological perspectives on health and illness and the sociology of medical care.

## **COURSE CONTENTS**

### **INTRODUCTION**

- || Medical Sociology, and the field of medical sociology
- || Contribution of sociology to medicine.

### **HEALTH AND DISEASE**

- || Social definition of illness
- || Health and disease as deviant behavior
- || Social cultural causes of disease

### **SOCIOLOGICAL PERSPECTIVES ON HEALTH & ILLNESS**

- || Functionalist Approach
- || Conflict Approach
- || Interactionist Approach
- || Labeling Approach

### **ILLNESS BEHAVIOR AND PERCEPTIONS OF ILLNESS**

- || Illness Behavior
- || Cultural Influences on Illness Behavior
- || Sociological and Demographic Influences
- || Lay Beliefs About Health and Illness
- || Self medication
- || Sick Role

### **SOCIAL DETERMINANTS OF HEALTH**

- || The Social Gradient
- || Stress
- || Early Life
- || Life Expectancy
- ☐ Social support networks
- ☐ Education and literacy
- ☐ Employment/working Condition
- ☐ Social environment
- ☐ Addiction
- ☐ Food
- ☐ Transport

## **PATIENT AND PHYSICAL THERAPIST**

- ☐ Physical Therapist's view of disease and the patient

### **Course Description**

- Patient's perspective of illness
- ☐ Patient Physical Therapist relationship
- ☐ Patient-nurses relation

## **SOCIOLOGY OF MEDICAL CARE**

- ☐ Hospitals
- ☐ Origin and development.
- ☐ Hospitals as social organization: problems of Quackery.
- ☐ Interpersonal relationship in medical settings.
- ☐ Mental illness in sociological perspective.
- ☐ Complementary & alternative Medicine (CAM)

## **RECOMMENDED BOOKS**

1. Sociology for Physiotherapists(2006) by Bid Dibyendunarayan Jaypee publisher
2. A.P Dixit (2005) Global Hiv/Aids Trends, Vista International Publications house New Delhi;
3. Diarmuid ODonovan(2008)The State of Health Atlas University of California Press;
4. G.C. Satpalhy(2003) Prevention of Hiv/Aids & Drug abuse, Isha Books, New Delhi.
5. Global Health Challenges for Human Security(ed.) Lincoln Chen et al. Global Equity. UK 2003.
6. Jai P Narain (2004) Aids in Asia the challenge ahead, Sage Publications New Delhi;
7. Julia A Ericksen(2008) Taking charge of Breast Cancer University of California Press;
8. Meena Sharma (2006) Aids, Awareness Through Community Participation Kalpaz Publications Delhi;
9. P Dixit (2005) Global HIV/AIDS Trends, Vista International Publishing House Delhi 110053;
10. Rose Weitz (2004) The Sociology of health, Illness & health care a critical approach Thomson Wadsworth.
11. Rubina Sehgal(2004)The Trouble Times; Sustainable Development in the age of extreme. Islamabad.

## **CIVIL SOCIETY AND DEVELOPMENT 2(2-0)**

Civil society over the past two decades has become an absolute component of development policy and practice. Almost all development initiatives, centered on different issues, seek to engage people and organizations representing them to make development more democratic, responsive and accountable. Despite this increasing emphasis on the term, civil society remains a contested, complex and multilayered concept. This course seeks to thoroughly explore the various dimensions and facets of this concept in the context of development. At the beginning, we will endeavour to conceptualize civil society by discussing its various shades and usages and its evolution in different settings over a period of time. We will then familiarize ourselves with a number of actors, forces and institutions that generally fall under the umbrella of civil society, which include, among others, social movements, NGOs/CBOs, trade organizations and religious organizations. Building on, this course analyzes nongovernmental sector's engagement with the state, democracy and the political process and scrutinizes relevant debates and trends.

Thereafter, our focus shifts towards global civil society, an idea and a force that is exceedingly becoming important in international politics, trade and development. This is followed by an assessment of and a discussion on people's organized involvement in human rights promotion and protection and humanitarian assistance in disaster-stricken and conflict-torn areas. We then turn to campus-based movements or students' and academics' role in activism. In the end, future trends in development are discussed and highlighted and the challenges they pose to civil society globally and locally.

### **Course Learning Outcomes**

This course is geared towards enabling the students to:

1. Conceptualize and critically unpack the often-contested concept of civil society.
2. Familiarize with a range of actors and forces constituting civil society.
3. Developing an understanding of the complex and multifaceted relation between civil society and development.
4. Gain an appreciation of nongovernmental sector's potential for development.

## Course Outline

### Issues of Discussion

Topic: Understanding Civil Society

Topic: Origins of Civil Society Sub-topics a. Historical Evolution

b. Contemporary Manifestations

Topic: Social Movements

Sub-topics: a. Forms and Classifications of Social Movements.

b. Case Study

Topic: Not-for-Profit Organizations/NGOs Sub-topics: a. Conceptualizing NGOs

b. Mandates, Scope and Structures

Topic: Trade Unions

Sub-topics: Struggle for Economic Justice

Topic: Religious Organizations

Sub-topics: a. Faith-based Organizations

Topic: Civil Society and State

Sub-topics: a. The Uneasy Relation

b. Collaboration

c. Contention

Topic: Civil Society, Democracy and Democratization Sub-topics: a. Issues-based Politics

b. Nongovernmental Sector and Democratization

Topic: Civil Society and Development Sub topics: Social Capital and civil society

Topic: Advocacy and Civil Society Sub-Topics: a. What is advocacy?

b. Conceiving and Running Advocacy Campaigns

Topic: Human Rights and Justice

Sub-topics: a. Discourses of Social Justice and Rights Protection in Civil Society

Rights: Promise and Performance. University of Pennsylvania Press.

- Cortright, D. (2008) 'Banning the Bomb' in 'Peace: A History of a Movements and Ideas'. Cambridge University Press.

- Torrance, W. and Torrance, A. (2006) 'Spinning the Green Web: Transnational Environmentalism. Batliwala, S and Brown, L. (ed.)

Transnational Civil Society: An Introduction. Kumarian Press

- Rootes, C. (2012) 'Student Movements' in The Wiley- Blackwell Encyclopedia of Social and Political Movements.

- Harriss, J. (2009) Drivers of Development over the Next 30 Years: Some Speculations. J. Int. Dev. 21, 772–775

## THIRD SEMESTER

Sr.No.	Course Title	Credit Hours
	<b>SECOND PROFESSIONAL YEAR</b>	
01	ENGLISH-III (Technical Writing & Presentation Skills)	3(3-0)
2	MEDICAL PHYSICS (Theory) MEDICAL PHYSICS (Practical)	3(2-1)
3	ANATOMY -III (Theory) ANATOMY -III (Practical)	3(2-1)
4	PHYSIOLOGY-III (Theory) PHYSIOLOGY-III (Practical)	3(2-1)
05	BIOMECHANICS & ERGONOMICS-I	3(3-0)
06	BIOSTATISTICS I	3(3-0)
07	ENTREPRENEURSHIP	2(2-0)
08	UNDERSTANDING QURAN-II	NON CH 1 HOUR/WEEK
<b>Total Credit Hours</b>		<b>20</b>

## ENGLISH-III

CREDIT HOURS 3(3-0)

### (TECHNICAL WRITING AND PRESENTATION SKILLS)

#### Course Outcomes:

At the end of the semester students should be able to

1. Demonstrate their enhanced language and technical writing skills
2. Develop critical thinking
3. Enable students to meet their real-life communication needs
4. Build up a well-rounded personality as a whole

#### Course Learning Objectives:

1. Create a well-formed essay in different categories
2. Interpret how to write a research paper and research proposal
3. Write a technical report and progress report writing
4. Execute extensive use of vocabulary in written communications
5. Build up presentation skills

### COURSE CONTENTS

#### Presentation skills

##### Essay writing

- Descriptive, narrative, discursive, argumentative

##### Academic writing

- How to write a proposal for research paper/term paper
- How to write a research paper/term paper (emphasis on style, content, language, form, clarity, consistency)

##### Technical Report writing

##### Progress report writing

#### Note

Extensive reading is required for vocabulary building

### RECOMMENDED BOOKS

#### Technical Writing and Presentation Skills Essay Writing and Academic Writing

1. Writing. Advanced by Ron White. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 435407 3 (particularly suitable for discursive, descriptive, argumentative and report writing).
2. College Writing Skills by John Langan. Mc-Graw-Hill Higher Education. 2004.
3. Patterns of College Writing (4<sup>th</sup> edition) by Laurie G. Kirszner and Stephen R. Mandell. St. Martin's Press.

#### Presentation Skills

##### Reading

1. The Mercury Reader. a Custom Publication. Compiled by Northern Illinois University. General Editors: Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharton. (A reader which will give students exposure to the best of twentieth century literature, without taxing the taste of engineering students)



## **MEDICAL PHYSICS**

### **COURSE DESCRIPTION**

**CREDIT HOURS: 3(2-1)**

This course will cover the basic principle of physics which are applicable in medical equipment used in Physical therapy. It also covers the fundamentals of currents, sound waves, electromagnetic radiations and their effects & application in physical therapy

### **Course Outcomes:**

At the end of the semester students should be able to

1. Describe the basic principle of physics which are applicable in medical equipment used in physical therapy
2. Describe the fundamentals of currents, sound waves, electromagnetic radiation and their effects and application in physical therapy

### **Course Learning Objectives:**

1. Understand the basic principles of physics used in electro-medical equipment
2. Define the laws of physics used in various aspects of physical phenomena and their interaction with the human body
3. Understand the basic concepts of electricity, its laws, magnetism, electro-mechanics and related theories
4. Understand the fundamentals of low, medium, and high frequency currents, heat, electromagnetic radiations, and sound waves
5. Understand safety skills in biomedical instruments and radiation protection
6. Laboratories will be used to practically demonstrate the application of the law of physics

## **COURSE CONTENTS**

### **ELECTRICITY AND MAGNETISM**

- Structure of an atom
- Electron Theory, Conductors & Insulators
- Conduction & Convection

### **STATIC ELECTRICITY**

- Charging by conduction and Induction
- Electrostatic Fields
- Capacitors, types of capacitors
- Arrangement of Capacitors in series and parallel
- Charging and discharging of capacitors
- Oscillating Discharge of Capacitors

### **CURRENT ELECTRICITY**

- Ohm's Law

- Electrical Components and their units
- Resistance and types
- Chemical effects of a Current
- Types of Current
- Cell and Batteries
- Simple Voltage Cell
- Combination of Cells in series and parallel
- Thermal effects of current
- Electrolysis and Electrolytic burns
- Ionization of gases and Thermionic emission
- Electronic tubes
- Diodes and Triodes

## **ELECTROMAGNETISM**

- Magnetic effect of an electric current
- Moving coil volt meter and Ammeter
- Measurement of high frequency and alternate current with meters
- Electromagnetic induction
- Faradays law
- Mutual and self-Induction
- Eddy currents
- Transformers
- Construction and types
- Static and auto Transformer

## **ELECTRO MECHANICS**

- Current for treatment
- Rectification
- Rectification of A.C
- Half wave and full wave Rectification
- Valve rectification circuits and metal rectifier
- Surging of current
- Vibrations and Multivibrators circuit

## **CLASSIFICATION OF CURRENTS (OVERVIEW)**

### **LOW FREQUENCY CURRENT**

- Sinusoidal current
- Faradic current
- Galvanic current (constant and interrupted)
- Diadynamic current TENS
- Super imposed current and their graphical representation.

### **MEDIUM FREQUENCY CURRENT**

- Interferential current
- Russian current.

### **HIGH FREQUENCY CURRENT**

- Valves

- Transistors
- Long waves, medium waves short waves micro waves

## **SOUND WAVES**

- Wave motion in sound
- Infrasonic
- Normal hearing band
- Characteristics of the sound waves and their velocities
- Ultrasonic
- Reflection and refraction of sound waves
- Characteristics of tone resonance and beats
- Interference of sound waves

## **HEAT**

- Scales of temperature and its conversion to other scales
- Nature of heat energy
- Specific heat and three modes of heat energy transfer effect of impurities on melting and boiling points

## **ELECTROMAGNETIC RADIATION**

- Electromagnetic spectrum
- Relationship between frequency and wave length
- Laws of reflection, refraction and absorptions
- Total internal reflection
- Cosine law and inverse square law
- Concave and convex mirrors
- Lenses and prisms
- Reflectors
- Radio wave (long, medium, short, micro waves)
- Infra-red rays
- Visible rays
- Ultra violet rays
- X-rays
- Nuclear waves (alpha beta and gamma)

## **SAFETY IN BIOMEDICAL INSTRUMENTS**

- Electrical outlets, hot, neutral and ground connections
- Pervasiveness of electricity and of electric shocks
- Causes of electric shocks and precaution
- Effect of electric current on human body
- Techniques to reduce the effect of electric shock
- Earth shocks and precaution against earth shocks

## **RADIATION PROTECTION**

- Ionizing and non-ionizing radiations
- Quantities and associated units of radiations
- Effect of ionizing and non-ionizing radiation
- Internal and external hazards
- Main principle to control external hazard

- Distance and shielding

### **LAB WORK**

- Specify resistance by using the potential divider
- Verify the joules law of electrical methods
- Calibrate a thermo couple and an unknown temperature
- Find the acceleration due to gravity by simple pendulum
- Verify the law of reflection of light
- Verify the law of refraction of light
- Verify the refraction index of glass using rectangular slab

### **RECOMMENDED BOOKS**

1. Clayton's Electrotherapy and actinotherapy by: P. M Scott.
2. Medical physics for physical therapists by: A. D Moore.
3. Preliminary Electricity for Physiotherapists by B. Savage.
4. Basic Electronics by Grob.
5. Principles of Bio-instrumentation by Richard A. Normann.
6. Hand book of Biomedical Instrumentation by R. S. Khanpur
7. Basic Radiation Protection Technology by Gollnick

## **ANATOMY-III**

**CREDIT HOURS: 4(3-1)**

### **COURSE DESCRIPTION**

The focus of this course is an in-depth and comprehensive study of human anatomy with emphasis on the head and neck, face and skull. Identify anatomical structures within the thorax with emphasis on structures of thoracic wall and thoracic cavity. Dissection and identification of structures in the manikins/smart board system supplemented with the study of charts, models, prosected materials and radiographs are utilized to identify anatomical landmarks and configurations of the head and neck, face, skull and thorax.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Explain the organization, neurovascular structures, bones & viscera of head & neck.
3. Explain the bones, ligaments joints & muscles of thoracic cage.
4. Explain the organization of mediastinum with their contents.

### **Course Learning Objectives:**

1. Describe the osteology of exterior of skull (Norma vertical is, occipitalis, frontalis and basalis)
2. Explain the osteology of the interior of skull (vault, anterior, middle and posterior cranial fossae)
3. Identify the foramina of skull and the structures passing through them
4. Explain the external and internal attachments of skull
5. Discuss the features of mandible and hyoid bone
6. Identify the features of cervical vertebrae
7. Identify the muscles and joints of the neck
8. Discuss the great vessels of head and neck
9. Relate the attachments of facial muscles with their actions
10. Explain the neurovascular supply of face, with course and branches of facial artery
11. Describe the gross morphology and blood supply of nose.
12. Describe the attachments, actions and neurovascular supply of the muscles of mastication.

13. Correlate the structure of temporomandibular joint with its neurovascular supply and movements.
14. Demonstrate the surface marking of:
  - a) Facial artery
  - b) Common carotid artery
  - c) External carotid artery
  - d) Internal jugular vein
  - e) External jugular vein
  - f) Parotid gland and duct
  - g) Facial nerve
15. Explain the gross anatomical features of eye with its neurovascular supply
16. Describe the extra-ocular muscles with their nerve supply and actions
17. Identify the extra-ocular muscles on a given model
18. Explain the anterior and posterior triangles of the neck
19. Describe the lymphatic drainage of head and neck
20. Discuss the cervical plexus present in the neck
21. Identify the bones & joints of rib cage
22. Describe the intercostal muscles, vessels, lymphatics & nerves
23. Describe the large vessels of thorax
24. Discuss the boundaries and contents of mediastinum and thoracic cage
25. Describe the structure of diaphragm
26. Discuss the gross anatomy of the heart & pericardium
27. Describe the structure of pleura & lungs
28. Describe the gross morphology of trachea and bronco-pulmonary segments

## **COURSE CONTENTS**

### **THE HEAD AND THE NECK**

- Muscles around the neck
- Triangles of the neck
- Main arteries of the neck
- Main veins of the neck
- Cervical part of sympathetic trunk
- Cervical plexus
- Cervical spine (vertebrae)
- Joints of neck.

### **THE FACE**

- Sensory nerves of the face
- Bones of the face
- Muscles of the face
- Facial nerve
- Muscles of mastication
- Mandible
- Hyoid bone
- Temporomandibular joint
- Brief description of orbit and nasal cavity
- Muscles of eye

### **THE SKULL**

- Bones of skull
- Anterior cranial fossa
- Middle cranial fossa
- Posterior cranial fossa
- Base of skull
- Structures passing through foramina.

## **THORAX**

### **STRUCTURES OF THE THORACIC WALL**

- Dorsal spine (vertebrae)
- Sternum
- Costal Cartilages & Ribs
- Intercostal Muscles
- Intercostal Nerves
- Diaphragm
- Blood supply of thoracic wall

- Lymphatic drainage of thoracic wall
- Joints of thorax

### **THORACIC CAVITY**

- Mediastinum
- Pleura
- Trachea
- Lungs
- Bronchopulmonary segments
- Pericardium
- Heart – Its blood supply, venous drainage & nerve supply
- Large veins of thorax, superior and inferior vena cava., pulmonary veins  
brachiocephalic veins
- Large Arteries – Aorta & its branches

### **LAB WORK**

During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester/year

#### **Note**

The students are expected to make a practical note book. The book is a collection of evidence that learning has taken place. It is a reflective record of their achievements

### **RECOMMENDED BOOKS**

1. Gray's Anatomy by Prof. Susan Standring 39<sup>th</sup> Ed., Elsevier.
2. Clinical Anatomy for Medical Students by Richard S. Snell.
3. Clinically Oriented Anatomy by Keith Moore.
4. Clinical Anatomy by R. J. Last, Latest Ed.
5. Cunningham's Manual of Practical Anatomy by G. J. Romanes, 15<sup>th</sup> Ed.,  
Vol-I, II and III.
6. The Developing Human. Clinically Oriented Embryology by Keith L.  
Moore, 6<sup>th</sup> Ed.
7. Wheater's Functional Histology by Young and Heath, Latest Ed.
8. Medical Histology by Prof. Laiq Hussain.
9. Neuroanatomy by Richard S. Snell.



## **PHYSIOLOGY-III**

### **COURSE DESCRIPTION**

**CREDIT HOURS: 3(2-1)**

The course is designed to study the function of the human body with emphasis on function of human respiratory system, nervous system, reproductive system, body fluids and renal system. These topics are addressed by a consideration of clinical and applied physiology in relation to clinical modules and practice

### **Course Outcomes:**

At the end of the semester students should be able to

1. Explain respiratory functions and its mechanics, integrate the pulmonary volume and capacities with regulation of respiration
2. Analyze the functional organization of the nervous system and integrate the operative and clinical significance with the principal structures of the brain
3. Enumerate the functions of reproductive hormones and correlate the ovarian and endometrial cycle with applied physiology
4. Recognize the structure and functional physiology of urogenital system and discuss the mechanisms involved in regulation and maintenance of renal physiology

### **Course Learning Objectives:**

1. Discuss the functional organization of respiratory system and briefly explain the mechanics of respiration
2. Enumerate lung volume and capacities with its values
3. Discuss the ventilation perfusion ratio and its significance
4. Explain diffusion of gases along with the various applicable laws
5. Discuss the mechanism to transport oxygen and carbon dioxide in the blood
6. Describe the regulation of respiration
7. Define and classify the different types of hypoxias with examples
8. Describe the functional organization of the central nervous system
9. Define and classify sensory receptors
10. Trace the sensory pathways
11. Describe pain physiology and its pathway
12. Explain pyramidal and the extrapyramidal system with the help of pathways
13. Discuss the different lobes and areas of the cerebral cortex with their functions
14. Describe the functions of the cerebellum and briefly enumerate its abnormalities
15. Discuss the functions of basal ganglia

16. Discuss the functional organization of the autonomic nervous system
17. Describe the phenomenon of sleep-in relationship to different waves of EEG
18. Enumerate the functions of the limbic system
19. Define and classify the different types of memories
20. Discuss the formation, circulation, functions and absorption of CSF
21. Discuss the role of skin in maintaining body temperatures
22. Describe the concept of set point, core and shell body temperature
23. Describe the process of spermatogenesis with the help of a flow chart
24. Enumerate the functions of sertoli and leydig cells
25. Explain the Endocrine control of the male reproductive system
26. Discuss the physiology of the female reproductive system
27. Explain the different phases of the menstrual cycle with the help of a diagram
28. Explain physiological changes during pregnancy
29. Describe the physiology of lactation
30. Differentiate between the ECF and ICF compartments with appropriate body fluid markers
31. Explain briefly the different types of nephrons and their functional significance with the help of a diagram
32. Define GFR and discuss factors regulating it
33. Explain various mechanisms of tubular reabsorption and secretion
34. Describe renal clearance
35. Describe countercurrent mechanism for the formation of concentrated urine
36. Explain the micturition reflex with the help of a flow chart.

## **COURSE CONTENTS**

### **RESPIRATORY SYSTEM**

- Function of respiratory tract
- Respiratory and non-respiratory function of the lungs
- Mechanics of breathing
- Production & function of surfactant and compliance of lungs
- Protective reflexes
- Lung volumes and capacities including dead space
- Diffusion of gases across the alveolar membrane
- Relationship between ventilation and perfusion
- Mechanism of transport of oxygen and carbon dioxide in blood
- Nervous and chemical regulation of respiration
- Abnormal breathing

- Hypoxia, its causes and effects
- Cyanosis, its causes and effects

## **NERVOUS SYSTEM**

- General organization of the nervous system
- Classification of nerve fibers
- Properties of synaptic transmission
- Function of neurotransmitters and neuropeptides
- Type and function of sensory receptors
- Function of the spinal cord and ascending tracts
- Reflex action and reflexes
- Muscle spindle and muscle tone
- Mechanism of touch, temperature and pain
- Functions of the cerebral cortex
- Difference between the sensory and motor cortex and their functions
- Motor pathways including pyramidal and extrapyramidal
- Basal Ganglia and its functions
- Cerebellum and its function
- Control of posture and equilibrium
- Physiology of sleep
- Physiology of memory
- Mechanism and control of speech
- Function of the thalamus
- Function of the hypothalamus and limbic system
- Production of CSF
- Mechanism of temperature regulation
- Function of the autonomic nervous system and the physiological changes of aging

## **REPRODUCTION**

- Function of the male reproductive system, Spermatogenesis
- Mechanism of erection and ejaculation
- Production and function of testosterone and Physiological changes during male puberty
- Function of the female reproductive system
- Production and function of estrogen, and progesterone
- Menstrual cycle
- Physiological changes during female puberty and menopause
- Pregnancy and the physiological changes taking place in the mother
- Function of the placenta
- Parturition and lactation

- Neonatal physiology

## **BODY FLUIDS AND KIDNEY**

- Components and quantitative measurements of body fluids
- Fluid compartments, tissue and lymph fluid
- Structure of the kidney and nephron
- General function of the kidney
- GFR and its regulation
- Formation of urine including filtration, re-absorption and secretion
- Plasma clearance, Mechanism of concentration and dilution of urine
- Water and electrolyte balance with reference to the kidney
- Role of the kidney in blood pressure regulation
- Hormonal functions of the kidney
- Acidification of urine and its importance
- Acid base balance with reference to the kidney
- Micturition and its control

## **LAB WORK**

### **RESPIRATORY SYSTEM**

- Stethography
- Breath sounds
- Respiratory rate
- Lung function tests

### **NERVOUS SYSTEM**

- Examination of superficial and deep reflexes
- Brief examination of the motor and sensory system
- Examination of the cranial nerves

### **Note**

The students are expected to make a practical note book. The book is a collection of evidence that learning has taken place. It is a reflective record of their achievements

### **RECOMMENDED BOOKS**

1. Textbook of Physiology by Guyton and Hall, Latest Ed.
2. Review of Medical Physiology by William F. Ganong, Latest Ed.
3. Physiology by Berne and Levy, Latest Ed.
4. Human Physiology: The Basis of Medicine by Gillian Pocock, Christopher D. Richards
5. Physiological Basis of Medical Practice by John B. West and Taylor, 12thEd.

## **BIOMECHANICS AND ERGONOMICS – I**

**CREDIT HOURS: 3(3-0)**

### **COURSE DESCRIPTION**

This course aims to develop appreciation of how mechanical principles can be applied to understand the underlying causes of human movement. It also examines selected anatomical, structural and functional properties of human connective, muscular, and nervous tissues, as well as skeletal structures. Emphasis is placed on the mechanical, neuroregulatory, and muscular events that influence normal and pathological motion

This course will also help to gain an understanding of basic theoretical concepts, principles and techniques of ergonomics as well as an introduction to fundamental ergonomic measurement tools for assessment of physical workload, posture, occupational exposure, and stress

### **Course Outcomes:**

At the end of the semester students should be able to

1. Apply the principles of biomechanics in physiotherapy. Using these principles, the student will be able to identify the mechanical causes of several pathologies of the locomotors system.
2. Analysing mechanical stresses per hierarchy as sedentary table work, inappropriate seating arrangement, constant standing, and over-exertion
3. Able to make strategies to prevent chemical and physical hazards.

### **Course Learning Objectives**

1. Apply the principles of mechanics to the human body and be able to articulate the same
2. Apply mechanical principles to identify the difficulty and faulty movements in a healthy individual
3. Apply biomechanical evaluation to common activities –static & dynamics
4. Identify mechanical hazards, psychological hazards, and biological hazards due to ergonomic alteration & ergonomic evaluation of the workplace

### **COURSE CONTENTS**

#### **BASIC TERMINOLOGY**

- Biomechanics
- Mechanics
- Dynamics
- Statics
- Kinematics
- Kinetics and anthropometries
- Scope of scientific inquiry addressed by biomechanics

- Difference between quantitative and qualitative approach for analyzing human

### **KINEMATIC CONCEPTS FOR ANALYZING HUMAN MOTION**

- Common units of measurement for mass, force, weight, pressure, volume, density, specific weight, torque and impulse
- Different types of mechanical loads that act on human body
- Uses of available instrumentation for measuring kinetic quantities

### **BIOMECHANICS OF TISSUES AND STRUCTURES OF THE MUSCULOSKELETAL SYSTEM**

- Biomechanics of Bone
- Biomechanics of Articular Cartilage
- Biomechanics of Tendons and Ligaments
- Biomechanics of Peripheral Nerves and Spinal Nerve Roots
- Biomechanics of Skeletal Muscles

### **BIOMECHANICS OF THE HUMAN UPPER EXTREMITY**

- Biomechanics of the Shoulder
- Biomechanics of the Elbow
- Biomechanics of the Wrist and Hand
- Factors that influence relative mobility and stability of upper extremity articulation
- Muscles that are active during specific upper extremity movements
- Biomechanical contributions to common injuries of the upper extremity

### **BIOMECHANICS OF HUMAN LOWER EXTREMITY**

- Biomechanics of the Hip
- Biomechanics of the Knee
- Biomechanics of the ankle and foot
- Factors influencing relative mobility and stability of lower extremity articulations
- Adaptation of lower extremity to its weight bearing functions
- Muscles that are active in specific lower extremity movements
- Biomechanical contribution to common injuries of the lower extremity.

### **ERGONOMICS**

#### **OVERVIEW AND CONCEPTUAL FRAMEWORK**

- Ergonomics and Therapy: An Introduction
- A Client-Centered Framework for Therapists in Ergonomics
- Macroergonomics

#### **KNOWLEDGE, TOOLS, AND TECHNIQUES**

- Ergonomic Assessments/Work Assessments
- Anthropometry

- Cognitive and Behavioral Occupational Demands of Work
- Psychosocial Factors in Work-Related Musculoskeletal Disorders
- Physical Environment
- Human Factors in Medical Rehabilitation Equipment:  
Product Development and Usability Testing

### **RECOMMENDED BOOKS**

1. *Basic biomechanics of musculoskeletal system* By: Nordin& Frankel, 3rd edition.
2. *Basic Biomechanics*, By: Susan J. Hall 4<sup>th</sup> edition.
3. Additional study material as assigned by the tutor.
4. *Ergonomics for the therapist* by Karen Jacobs 3<sup>rd</sup> edition mosby and Elsevier publishers

## **BIOCHEMISTRY-I**

**CREDIT HOURS: 2(2-0)**

### **COURSE DESCRIPTION**

This course provides the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It covers introduction to the biomolecules i.e. amino acid, proteins carbohydrates, fats, enzymes and nucleic acids. The nutritional biochemistry concludes the course

### **Course Outcomes:**

At the end of the semester students should be able to

1. Understanding the structure of the cell, various cellular events, the function of various subcellular organelles, the composition of the cytoskeleton and extracellular matrix, the function of membrane proteins, receptors and signaling molecules and transport mechanisms
2. Understanding the different types of body fluids and their function in the human body, classification of amino acids and their physical and chemical properties, the sources of proteins, their structural organization and their classification, the enzyme classification and its properties, the enzymes that are used for diagnosis of diseases
3. Demonstrate in depth knowledge of the classification, properties and biological importance of carbohydrates, classification and biological importance of lipids, properties and biomedical importance of cholesterol, eicosanoids and TAGs
4. Evaluate the biological role of lipid per oxidation and its significance and the significance of bile acids/salts, the biochemical role of nucleotides and the structure and functions of DNA, the structure and functions of RNA
5. Understand the fundamental concepts of nutrition and health, the role of nutrients in the optimal functioning of key biochemical pathways in the body
6. Integrate biochemical problems with clinical problems resulting from nutritional deficiencies



## **COURSE LEARNING OBJECTIVES:**

1. Define biochemistry
2. Define and describe cell biochemical aspects
3. Define and describe cell membrane structures, membrane proteins, receptors and signal molecules
4. Discuss the structure and properties of water, weak acids and bases
5. Give the concept of pH and pK, buffers, their mechanism of action, body buffers.
6. Classify amino acids and their biomedical importance and explain the structure, physical, chemical properties and functions of amino acids
7. Classify proteins on the basis of functions, physical and chemical properties
8. Explain the structural levels of proteins and correlate the structural abnormalities of proteins
9. Discuss fibrous proteins (collagens and elastin) and globular proteins
10. Define and explain the properties of enzymes, coenzymes, isozymes and proenzymes
11. Discuss the regulation and inhibition of enzymes activity and enzymes inhibitors
12. Discuss clinical diagnostic enzymes
13. Define carbohydrate and its different classifications
14. Define the following terms: stereoisomer, enantiomer, epimer, anomer, D and L sugars
15. Explain the structure, properties and function of monosaccharides, disaccharide, oligosaccharide, polysaccharide and bacterial cell wall
16. Explain the functions and clinical importance of different glycosaminoglycan
17. Discuss the biomedical functions of lipids and their classifications
18. Discuss the essential fatty acids and their biomedical importance
19. Explain the sources, properties, and biomedical role of cholesterol and tag
20. Explain the role of different lipoproteins in the development of atherosclerosis
21. Discuss the various properties of lipids such as saponification and rancidity
22. Explain the biochemical role of eicosanoids
23. Discuss lipid peroxidation and its significance
24. Discuss the significance, bile acids/salts
25. Discuss the structure, functions and biochemical role of nucleotides
26. Discuss the structure and functions of DNA, structure and functions of RNA
27. Discuss the sources, absorption, regulation, biochemical function and clinical aspect of macro mineral i.e sodium, potassium, calcium, chloride,

phosphate, micro mineral i.e iron, zinc, magnesium, selenium, iodine, copper, manganese

28. Discuss the biochemical role and clinical aspect/deficiencies of the following vitamins i.e fat soluble vitamins: A, D, E, K and water soluble, vitamins: c, b1, folic acid, thiamine, pyridoxine, riboflavin, nicotinic acid, pantothenic acid, biotin, vitamin b12

29. Comprehend the basic concepts of energy with regard to diet and nutritional aspects of various dietary components

30. Discuss balanced diets, over-nutrition and under-nutrition (malnutrition). Recommended dietary allowances

## **COURSE CONTENTS**

### **CELL**

- Introduction to Biochemistry
- Cell: (Biochemical Aspects)
- Cell Membrane Structure
- Membrane Proteins
- Receptors & Signal Molecules

### **BODY FLUIDS**

- Structure and properties of Water
- Weak Acids & Bases
- Concept of pH & pK
- Buffers, their mechanism of action
- Body buffers

### **BIOMOLECULES, AMINO ACIDS, PEPTIDES & PROTEINS**

- Amino acids: Classification
- Acid-Base Properties
- Functions & Significance
- Protein Structure, Primary, Secondary & Super secondary. &, Structural Motifs
- Tertiary & Quaternary Structures of Proteins
- Protein Domains
- Classification of Proteins
- Fibrous proteins (collagens and elastins ) & Globular proteins

### **ENZYMES**

- Introduction
- Classification & Properties of Enzymes
- Coenzymes

- Isozymes & Proenzymes
- Regulation & Inhibition of Enzyme activity & enzymes inhibitors
- Clinical Diagnostic Enzymology

## **CARBOHYDRATES**

- Definition
- Classification
- Biochemical Functions & Significance of Carbohydrates
- Structure & Properties of Monosaccharides& Oligosaccharides
- Structure & Properties of Polysaccharides
- Bacterial cell Wall
- Heteropolysaccharides
- GAGS

## **LIPIDS**

- Classification of Lipids
- Fatty Acids: Chemistry
- Classification occurrence & Functions
- Structure & Properties of Triacylglycerols and Complex Lipids
- Classification & Functions of Eicosanoids
- Cholesterol: Chemistry, Functions & Clinical Significance
- Bile acids/salts.

## **NUCLEIC ACIDS**

- Structure, Functions & Biochemical Role of Nucleotides
- Structure & Functions of DNA
- Structure & Functions of RNA.

## **NUTRITIONAL BIOCHEMISTRY MINERALS & TRACE ELEMENTS**

- Sources
- RDA
- Biochemical Functions & Clinical Significance of Calcium & Phosphorus
- Sources
- RDA
- Biochemical Functions & Clinical Significance of Sodium Potassium& Chloride
- Metabolism of Iron, Cu, Zn, Mg, Mn, Se, I,F.

## **VITAMINS**

- Sources
- RDA

- Biochemical Functions & Clinical Significance of Fat Soluble Vitamins
- Sources
- RDA
- Biochemical Functions & Clinical Significance of Water Soluble
- Vitamins.

### **NUTRITION**

- Dietary Importance of Carbohydrates, Lipids & Proteins
- Balanced Diet

### **RECOMMENDED BOOKS**

1. Harper's Biochemistry by Robbert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell, Latest Ed.
2. Lippincott's Illustrated Review of Biochemistry by Pamela C. Champe and Richard A. Harvey, Latest Ed.
3. Practical Clinical Biochemistry by Varley.
4. Textbook of Biochemistry by Devlin, 5<sup>th</sup> Ed.
5. Textbook of Medical Biochemistry Vol-I and II by M.A. Hashmi. Biochemistry by Stryer, Lubert, Latest Ed.

## **Entrepreneurship COURSE DESCRIPTION**

**2(2-0)**

Welcome to the challenging and exciting world of business and entrepreneurship. In this course we will look at various aspects of starting, managing and owning your business from creating a new idea, business strategy, marketing, leadership, finances and legal issues. We will also focus on successful entrepreneurs and analyze reasons for their success. The focus of this course is to motivate students to start their own businesses and to provide practical business strategies and tools to enable them to own and manage their own business or to work in their family owned business successfully.

1. Identify and apply the elements of entrepreneurship and to entrepreneurial processes;
2. Recognize the importance of entrepreneurship and identify the profile of entrepreneurs and their role in economic growth;
3. Use the entrepreneurial mind-set and behave responsibly and ethically in their roles as entrepreneurs.
4. Creatively analyze the business environment, opportunity recognition, and the business idea-generation process;
5. Write a business plan that creates and starts a new venture.
6. Apply a strategy for growth and manage the implications of growth;

	By the end of semester, students will be able to:
1	To inculcate the spirit of Entrepreneurship
2	To analyze and identify the key success factors for new entrepreneurial ventures.
3	Identify the process involved in starting and managing a new business successfully
4	To provide an understanding of business planning methodologies and the skills to develop a business plan for a new or existing business.
5	To provide an understanding of strategic, marketing, financial, legal issues related to SME's.
6	To identify and highlight the role of entrepreneurs in Pakistan

## **INTRODUCTION TO ENTREPRENEURSHIP**

The Revolutionary impact of Entrepreneurship:

- The concept of Entrepreneurship
- The Entrepreneurial Process
- Role of Entrepreneurship in Economic Development
- Attributes of Successful Entrepreneurs
- Basic concept of SME'S
- To define and explore the major schools of entrepreneurial thought

- To explain the process approaches to the study of entrepreneurship
- To set forth a comprehensive definition of entrepreneurship
- To examine the Entrepreneurial Revolution taking place today
- To illustrate today's entrepreneurial environment

### **Business Plan Preparation for New Ventures**

- To define a business plan and demonstrate its value.
- To explore the planning pitfalls that plagues many new ventures.
- To describe the benefits of a business plan.
- To set forth the viewpoints of those who read a business plan.
- To emphasize the importance of coordinating the business plan segments.
- To review key recommendations by venture capital experts regarding a plan.
- To present a complete outline of an effective business plan.
- To present some helpful hints for writing an effective business plan.

To highlight points to remember in the presentation of a business plan. **The working and importance of SMEDA for the entrepreneur**

- What is SMEDA?
- What is the importance of SMEDA?

What are the functions of SMEDA? **Corporate Entrepreneurship:**

- To understand the entrepreneurial mindset in organizations
- To illustrate the need for entrepreneurial thinking in organizations

To define the term —corporate entrepreneurship‖ **The Family business, Social and Ethical Perspectives of Entrepreneurship:**

- Definition of family business
- Development cycle of family business
- Problems of family business
- To examine the concept of —social entrepreneurship‖

To introduce the challenges of social enterprise **The Assessment Function with Opportunities:**

- To explain the challenge of new-venture start-ups
- To present critical factors involved in new-venture development

To examine why new ventures fail

**Legal Challenges in Entrepreneurship**

- To introduce the importance of legal issues to entrepreneurs
- To examine patent protection, including definitions and preparation
- To review copyrights and their relevance to entrepreneurs
- To study trademarks and their impact on new ventures
- To examine the legal forms of organization—sole proprietorship, partnership, and corporation

To illustrate the advantages and disadvantages of each of these three legal forms **The Marketing Aspects of New Ventures**

- To review the importance of marketing research for new ventures
- To identify the key elements of a proper survey
- To present the emerging use of Internet marketing for entrepreneurial firms

To examine the marketing concept: philosophy, segmentation, and consumer orientation

**Text Book:**

Donald. F.Kuratko (2009) Entrepreneurship, 8<sup>TH</sup> editon. South-Western College Publishers

**Reference Book:**

- 1) Hisrich R., Peter, M, (2000) Entrepreneurship, 4<sup>th</sup> Edit. McGraw - Hill
- 2) Timmons, J., Spinelli, S. (2007) New Venture Creation 7<sup>th</sup> Edit. McGraw -Hill

## FOURTH SEMESTER

Sr. No.	Course Title	Credit Hours
01	ANATOMY-IV (Neuro Anatomy) (Theory) ANATOMY-IV (Neuro Anatomy) (Practical)	3(2-1)
02	BIOMECHANICS & ERGONOMICS-II	3(2-1)
03	HEALTH & WELLNESS	2(2-0)
04	BIOSTATISTICS II (university optional)	3(3-0)
05	PROFESSIONAL PRACTICE (LAWS , ETHICS &ADMINISTRATION)	2(2-0)
06	EXERCISE PHYSIOLOGY (Theory) EXERCISE PHYSIOLOGY (Practical)	3(2-1)
07	MOLECULAR BIOLOGY & GENETICS	2(2-0)
08	UNDERSTANDING QURAN-III	NON CH 1 HOUR/WEEK
<b>Total Credit Hours</b>		<b>18</b>



**ANATOMY - IV (Neuro Anatomy)****CREDIT HOURS 3 (2-1)****COURSE DESCRIPTION**

The purpose of the course is to provide the students an in-depth study and analysis of the regional and systemic organization of the body. Course will emphasis on structure and function of human movement. Course will cover human anatomy with emphasis on the nervous, skeletal, muscle, and circulatory systems. Course will lay down the foundation of General Anatomy, the understanding of Neuroanatomy (regional Anatomy) to be supplemented through dissection and identification of structures in the manikins/smart boards, charts, models, prosected materials and radiographs

**Course Outcomes:**

At the end of the semester students should be able to

1. Explain the parts of nervous system
2. Relate the gross and cross-sections of different parts of CNS with their lesions
3. Explain 12 pairs of cranial nerves

**Course Learning Objectives:**

1. Explain the general layout of the nervous system and its classification
2. Discuss the gross anatomy & cross sections of spinal cord with blood supply
3. Discuss the ascending tracts of spinal cord with their functions and clinical correlates
4. Discuss the descending tracts of the spinal cord with their functions and clinical correlates
5. Explain the gross structure of brain stem (medulla, pons and midbrain)
6. Discuss the cross sections of brain stem (medulla, pons and midbrain) at different levels with clinical correlates
7. Discuss in detail cranial nerves I – XII
8. Discuss the gross structure of cerebellum and fibers associated with it
9. Explain the cranial meninges with their neurovascular supply and clinical correlates.
10. Explain the Dural infoldings/ reflections
11. Relate the location and communications of Dural venous sinuses with their clinical significance
12. Demonstrate the sulci and gyri of cerebrum on the model
13. Explain the functions of different cortical areas of cerebrum with their lesions
14. Describe the white matter (commissural, projection and association fibers) of brain
15. Relate the parts of basal nuclei of the brain with clinical disorders
16. Describe the gross structure of autonomic nervous system
17. Explain the ventricular system of brain with clinical correlates

18. Describe the blood supply of the brain
19. Demonstrate the examination of cranial nerves

## **COURSE CONTENTS**

### **NEURO ANATOMY**

- Central Nervous System: Disposition, Parts and Functions
- Brain stem (Pons, Medulla, and Mid Brain)
- Cerebrum
- Cerebellum
- Thalamus
- Basal ganglia
- Lymbic system
- Hypothalamus
- Internal Capsule
- Blood Supply of Brain
- Stroke and its types
- Ventricles of Brain
- CSF circulation and Hydrocephalus
- Meninges of Brain
- Neural pathways (Neural Tracts)
- Pyramidal and Extra pyramidal System (Ascending and Descending tracts)
- Functional significance of Spinal cord level
- Cranial Nerves with special emphasis upon IV, V, VII, XI, XII (their course, distribution, and palsies)
- Autonomic nervous system, its components
- Nerve receptors.

### **SPINAL CORD**

- Gross appearance
- Structure of spinal cord
- Grey and white matter (brief description)
- Meninges of spinal cord
- Blood supply of spinal cord
- Autonomic Nervous system

### **LAB WORK**

During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester/year

**Note**

The students are expected to make a practical note book. The book is a collection of evidence that learning has taken place. It is a reflective record of their achievements

**RECOMMENDED BOOKS**

- Gray's Anatomy by Prof. Susan Standring 41<sup>th</sup> Ed., Elsevier.
- Clinical Neuroanatomy Anatomy for Medical Students by Richard S. Snell,
- Clinically Oriented Anatomy by Keith Moore.
- Clinical Anatomy by R.J. Last, Latest Ed.
- Cunningham's Manual of Practical Anatomy by G.J. Romanes, 15<sup>th</sup> Ed., Vol-I, II and III.

## **BIOMECHANICS AND ERGONOMICS-II**

**CREDIT HOURS 3(2-1)**

### **COURSE DESCRIPTION**

This course aims to develop appreciation of how mechanical principles can be applied to understand the underlying causes of human movement. This course will also help to gain an understanding of basic theoretical concepts, principles and techniques of ergonomics as well as an introduction to fundamental ergonomic measurement tools for assessment of physical workload, posture, occupational exposure, and stress

### **Course Outcomes:**

At the end of the semester students should be able to

1. Apply the principles of biomechanics in physiotherapy. Using these principles, the student will be able to identify the mechanical causes of several pathologies in the locomotor system
2. Analyzing mechanical stresses per hierarchy as sedentary table work, inappropriate seating arrangements, constant standing, and over-exertion
3. Demonstrate the ability to make strategies to prevent chemical and physical hazards.

### **Course Learning Objectives:**

- 1 Apply the principles of mechanics to the human body and be able to articulate the same
2. Apply mechanical principles to identify the difficulty and faulty movements in a healthy individual
3. Apply biomechanical evaluation to common activities – static & dynamics
4. Identify mechanical hazards, psychological hazards, and biological hazards due to ergonomic alteration and ergonomic evaluation of the workplace

### **COURSE CONTENTS**

#### **BIOMECHANICS OF HUMAN SPINE**

- Biomechanics of the Lumbar Spine
- Biomechanics of the Cervical Spine
- Factors influencing relative mobility and stability of different regions of Spine
- Biomechanical adaptations of spine during different functions
- Relationship between muscle location, nature and effectiveness of muscle action in the trunk
- Biomechanical contribution to common injuries of the spine

## **APPLIED BIOMECHANICS**

- Introduction to the Biomechanics of Fracture Fixation
- Biomechanics of Arthroplasty
- Engineering Approaches to Standing, Sitting, and Lying
- Biomechanics of Gait

## **ANGULAR KINETICS OF HUMAN MOVEMENT**

- Angular analogues of mass, force, momentum and impulse
- Angular analogues of Newton's laws of motion
- Centripetal and Centrifugal forces
- Angular acceleration

## **ANGULAR KINEMATICS OF HUMAN MOVEMENT**

- Measuring body angles
- Angular kinematics Relationships
- Relationship between Linear and Angular motion

## **HUMAN MOVEMENT IN FLUID MEDIUM**

- The nature of fluids
- Buoyancy and floatation of human body
- Drag and components of drag
- Lift Force
- Propulsion in a fluid medium

## **ERGONOMICS II**

### **SPECIAL CONSIDERATIONS**

- Lifting Analysis
- Seating
- Computers and Assistive Technology

### **APPLICATION PROCESS**

- Ergonomics of Children and Youth.
- Ergonomics of Aging
- Ergonomics in Injury Prevention and Disability Management
- Ergonomics of Play and Leisure

## **LAB WORK**

### **GONIOMETRY**

- Introduction to Goniometry
- Basic concepts in Goniometry
- Joint motion
- Range of motion
- Factors affecting ROM
- End-feel

- Capsular and non-capsular pattern of ROM limitation
- Procedures
- Positioning
- Stabilization
- Measurements Instruments
- Alignment
- Recording
- Procedures
- Measurement of upper extremity & lower extremity
- Measurement of temporomandibular, cervical , thoracic & lumber spine
- Joint measurement by body position
- Biomechanical assessment of Upper extremity
- Biomechanical assessment of Lower Extremity
- Biomechanical assessment of Gait
- Reflective case assignment related to biomechanics of various regions of the body
- Measurement of angles of joints
- Biomechanical study of deformities

#### **RECOMMENDED BOOKS**

- *Basic biomechanics of musculoskeletal system* By: Nordin& Frankel, 3rd edition.
- *Basic Biomechanics*, By: Susan J. Hall 4<sup>th</sup> edition.
- Additional study material as assigned by the tutor.
- *Ergonomics for the therapist* by Karen Jacobs 3<sup>rd</sup> edition mosby and Elsevier publishers.

## **HEALTH & WELLNESS**

**CREDIT HOURS 2(2-0)**

### **COURSE DESCRIPTION**

This course will facilitate discussion on the theories of health and wellness, including motivational theory, locus of control, public health initiative, psycho-social, spiritual and cultural. The course will cover health risks, screening, and assessment considering epidemiological principles. This will also cover risk reduction strategies for primary and secondary prevention, including programs for special populations

### **Course Outcomes:**

At the end of the semester students should be able to

1. Demonstrate health risks, screening and assessment considering epidemiological principles
2. Identify and describe theories of health and wellness, including motivational theory, the locus of control, public health initiatives and psycho-social aspects

### **Course Learning Objectives:**

1. Illustrate the health, fitness and wellness and role of PT in health and wellness
2. Compare mental and physical fitness
3. Identify health, fitness and wellness issues during childhood and adolescence
4. Identify health, fitness and wellness issues during adulthood
5. Identify health, fitness and wellness issues in older adults
6. Identify women health issues focus on pregnancy.

## **COURSE CONTENTS**

### **PREVENTION PRACTICE**

#### **A HOLISTIC PERSPECTIVE FOR PHYSICAL THERAPY**

- Defining Health
- Predictions of Health Care
- Comparing Holistic Medicine and Conventional Medicine
- Distinguishing Three Types of Prevention Practice.

### **HEALTHY PEOPLE**

- Definition of healthy people
- Health education Resources
- Physical Therapist role for a healthy community.

## **KEY CONCEPTS OF FITNESS**

- Defining & Measuring Fitness
- Assessment of Stress with a Survey
- Visualizing Fitness
- Screening for Mental and Physical Fitness
- Body Mass Index calculations

## **FITNESS TRAINING**

- Physical Activities Readiness Questionnaire
- Physical Activities Pyramid
- Exercise Programs

## **SCREENING FOR HEALTH, FITNESS, AND WELLNESS**

- Distinguishing Screening, Evaluation & Examination
- Interviewing for Health, Fitness and Wellness
- Vital Signs, 3-minute Step Test, and Borg perceived Scale of Exertion
- Seven Dimensions of Wellness
- Physical Health Screening.

## **HEALTH, FITNESS, AND WELLNESS ISSUES DURING CHILDHOOD AND ADOLESCENCE**

- Structure and Function
- Recognizing and Reporting Child abuse
- Denver II Developmental Screening
- Special Concerns in Pediatrics
- Program for Prevention of Obesity

## **HEALTH, FITNESS, AND WELLNESS DURING ADULTHOOD**

- Tasks of Adulthood
- Adult Health and Wellness Risks
- Screening Tools for Adulthood
- Adult Educational Materials

## **WOMEN'S HEALTH ISSUES: FOCUS ON PREGNANCY**

- Screening for Women's Health
- Women's Heart Disease
- Female Athlete Triad
- Educational Material for Women
- Pre-partum and Postpartum Exercises

## **PREVENTION PRACTICE FOR OLDER ADULTS**

- Ageism
- Anatomical and Physiological Changes with Aging
- Common Health Problems of Older Adults
- Screening Older Adult for Health Fitness and Wellness



- Fitness for Older Adults

### **RESOURCES TO OPTIMIZE HEALTH AND WELLNESS**

- Chronic Illness
- Nutrition
- Progressive Relaxation
- Time management
- Spirituality

### **HEALTH PROTECTION**

- Infection Control
- Injury Prevention during Childhood
- Injury prevention during Adolescence
- Injury Prevention during Adulthood
- Injury Prevention during Older Adulthood

### **MARKETING HEALTH AND WELLNESS**

- Definition of Marketing
- Marketing Strategies for health and wellness Centers.

### **RECOMMENDED BOOKS**

- A Physical Therapist's Guide to Health, Fitness, and Wellness, By Catherine R Thompson, PhD, MS, PT.

**COURSE DESCRIPTION**

This course will provide the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It will also cover the basic biochemical, cellular, biological and microbiological processes, basic chemical reactions in the prokaryotic and eukaryotic cells, the structure of biological molecules, introduction to the nutrients i.e. carbohydrates, fats, enzymes, nucleic acids and amino acids. The course also covers the section of nutritional biochemistry

**Course Outcomes:**

At the end of the semester students should be able to

1. Understand components of ECM, the significance of proteins in ECM
2. Explain bioenergetics and biological oxidation, the digestion of biomolecules and their clinical significance
3. Understand metabolic pathways and the integration of carbohydrates, metabolic pathways and the integration of lipids, metabolic pathways and integration of proteins and amino acids and the metabolism of proteins

**Course Learning Objectives:**

1. Define and describe the extracellular matrix, collagen, elastin and extracellular matrix component
2. Discuss the biochemical function of proteoglycans, bone and teeth, muscle and cytoskeletons
3. Explain biological oxidation with clinical disorders (bioenergetics)
4. Explain the respiratory chain and oxidation phosphorylation
5. Explain the process of ATP synthesis
6. Explain uncouplers and inhibitors of oxidative phosphorylation
7. Describe the digestion and absorption of carbohydrates with their clinical significance
8. Identify the mechanism leading to malabsorption
9. Explain glycolysis and TCA with their clinical correlation
10. Discuss glycogen metabolism with its clinical significance explain gluconeogenesis with clinical significance
11. Explain the biomedical importance of HMP shunt
12. Explain hemolysis in g6pd deficiency
13. Describe biomedical importance of uronic acid pathway
14. Explain fructose metabolism with its clinical significance

15. Describe the digestion and absorption of lipids, with their clinical significance
16. Explain the steps, regulation, biomedical importance and clinical disorder of fatty acids synthesis
17. Describe the oxidation of fatty acid steps, regulation and its clinical disorders
18. Describe the metabolism of cholesterol and its clinical disorders
19. Describe the metabolism of ketone bodies and its clinical importance
20. Describe the metabolism of lipoproteins and its clinical disorders
21. Correlate biochemical basis to the development of coronary heart disease and atherosclerosis
22. Discuss the metabolism and clinical disorders of eicosanoids
23. Discuss the metabolism of phospholipids and its clinical significance
24. Describe the digestion and absorption of proteins and absorption of amino acids with their clinical significance
25. Explain the biochemical importance of transamination and deamination
26. Describe the mechanism of transport of ammonia and the formation of urea
27. Discuss the effects of ammonia toxicity on the brain

## **COURSE CONTENTS**

### **TISSUE BIOCHEMISTRY**

- Extracellular Matrix
- Collagen
- Elastin and Extracellular Matrix Components
- Biochemistry of Proteoglycans
- Bone & Teeth
- Muscle & Cytoskeleton

### **METABOLISM BIOENERGETICS**

- Introduction to Bioenergetics
- Biological Oxidations
- Electron Transport Chain and Oxidative Phosphorylation

### **METABOLISM OF CARBOHYDRATES**

- Digestion & Absorption of Carbohydrates
- Glycolysis & its Regulation
- Citric Acid Cycle
- Metabolism of Glycogen
- Gluconeogenesis and regulation of blood glucose
- Pentose Phosphate Pathway & its Significance

### **METABOLISM OF LIPIDS**

- Digestion & Absorption of Lipids

- Metabolism & Clinical Significance of Lipoproteins
- Fatty acid oxidation biosynthesis and metabolism of Triacylglycerols
- Metabolism & clinical Significance of Cholesterol
- Metabolism of Eicosanoids

### **METABOLISM OF PROTEINS & AMINO ACIDS**

- Digestion of Proteins & Absorption of Amino Acids
- Transamination & Deamination of Amino Acids and urea cycle
- Specialized products formed from Amino Acids

### **LAB WORK**

#### **Section 1**

##### **Techniques of Instruments in Clinical Biochemistry with examples.**

1. Visible Spectrophotometry
2. Flame photometry
3. UV & IR spectrophotometry
4. Atomic Absorption spectrophotometry
5. pH Metry
6. Chromatography and determination of Amino Acids in Urine by pape chromatography

#### **Section 2**

##### **Clinical quantatives analysis in Biochemistry**

1. Sample Collection Blood, Faces and body fluids
2. Serum Glucose Estimation
3. Glucose tolerance Test (GTT)
4. Serum Cholesterol estimation (Total, HDL and HDL cholesterol)
5. Serum Bilirubin Estimation (Total, Direct and Indirect bilirubins)
6. Serum Amylase Estimation
7. Serum AST Estimation
8. Serum ALT Estimation
9. Serum ALP Estimation
10. Serum Creatine Kinase(CK) Estimation
11. Serum Ascorbic acid Estimation
12. Serum LDH Estimation
13. Serum Proteins Estimation (Total, Albumin & Globulin)
14. Serum Total lipids Estimation
15. Serum calcium Estimation (total, ionized & unionized)
16. Serum Uric acid Estimation
17. Serum Magnesium Estimation
18. Serum Urea Estimation

## 19. Serum Creatinine Estimation

### **RECOMMENDED BOOKS**

1. Harper's Biochemistry by Robbert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell, Latest Ed.
2. Lippincott's Illustrated Review of Biochemistry by Pamela C. Champe and Richard A. Harvey, Latest Ed.
3. Practical Clinical Biochemistry by Varley.
4. Textbook of Biochemistry by Devlin, 5<sup>th</sup> Ed.
5. Textbook of Medical Biochemistry Vol-I and II by M. A. Hashmi.  
Biochemistry by Stryer, Lubert, Latest Ed.

## **EXERCISE PHYSIOLOGY**

**CREDIT HOURS: 3(2-1)**

### **COURSE DESCRIPTION**

This course aims to develop a critical appreciation of exercise and applied physiology. The course will also enable the readers to understand injury prevention, rehabilitation and performance enhancement strategies.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Injury prevention, rehabilitation and performance enhancement strategies
3. The role of hormonal, circulatory, respiratory and thermal responses to exercise
4. Principles of cardiopulmonary training
5. Apply the basic principles of physics to exercise therapy in the human body, the techniques in the restoration of physical functions, anatomy, physiology, and knowledge of biochemistry to plan and execute exercise regimens
6. Incorporate biomechanical principles into exercise therapy
7. Demonstrate clinical competence for independent decision making regarding the best therapeutic treatments

### **Course Learning Objectives**

1. Describe the hormonal control of substrate mobilization during exercise
2. Discuss the different types of methods for improving strength
3. Explain the respiratory adaptation to exercise
4. Discuss the circulatory responses to exercise
5. Identify the effects of ANS on the circulatory system during exercise
6. Identify the sequence of steps in the procedures for evaluating cardiorespiratory fitness (CRF)
7. Enumerate the common measures taken during graded exercise test (GXT)
8. Discuss the VO<sub>2</sub> Max, cardiac output and arterio-venous oxygen difference
9. Discuss the changes in oxygen delivery to muscles during exercise
10. Define and classify various types of muscle fatigue
11. Describe the physiology of performance and enumerate the factors affecting aerobic and anaerobic exercises
12. Explain the cori cycle with the help of an illustration
13. Describe the blood gas responses to exercise
14. Understand the physiological effects of exercises on different systems of the human body

15. Define the role of exercises in the development of strength, power, muscular endurance, and cardiovascular endurance in elite athletes, normal and physical impaired individuals of all ages
16. Construct testing procedures for treatment planning and prescription of exercise programs to restore health and maintain fitness levels
17. Able to obtain an entry-level position in the health, fitness rehabilitation, and sports performance setting

## **COURSE CONTENTS**

### **PHYSIOLOGY OF EXERCISE**

#### **CONTROL OF INTERNAL ENVIRONMENT**

- Homeostasis
- Control systems of the body
- Nature of the control system
- Examples of homeostatic control
- Exercise : A test of homeostatic control

#### **HORMONAL RESPONSES TO EXERCISE**

- Neuroendocrinology
- Hormones: Regulation and action
- Hormonal control of substrate mobilization during exercise

#### **MEASUREMENT OF WORK, POWER & ENERGY EXPENDITURE**

- Units of measure
- Work and power defined
- Measurement of work and power
- Measurement of energy expenditure
- Estimation of energy expenditure
- Calculation of exercise efficiency

#### **CIRCULATORY RESPONSES TO EXERCISE**

- Organization of the circulatory system
- Heart: myocardium and cardiac cycle
- Cardiac output
- Hemodynamics
- Changes in oxygen delivery to muscle during exercise
- Circulatory responses to exercise
- Regulation of cardiovascular adjustments to exercise

#### **RESPIRATION DURING EXERCISE**

- Function of the lung
- Structure of respiratory system
- Mechanics of breathing
- Pulmonary ventilation
- Pulmonary volumes and capacities

- Diffusion of gases
- Blood flow to the lungs
- Ventilation-perfusion relationships
- O<sub>2</sub> and CO<sub>2</sub> transport in blood
- Ventilation and acid base balance
- Ventilatory and blood-gas responses to exercise
- Control of ventilation

### **TEMPERATURE REGULATION**

- Overview of heat balance during exercise
- Overview of heat production/heat loss
- Body's thermostat-hypothalamus
- Thermal events during exercise
- Exercise in the heat
- Exercise in cold environment.

### **THE PHYSIOLOGY OF TRAINING: EFFECT ON VO<sub>2</sub> MAX, PERFORMANCE, HOMEOSTASIS AND STRENGTH**

- Principles of training
- Research designs to study training
- Endurance training and VO<sub>2</sub> max
- VO<sub>2</sub> max: cardiac output and arterio-venous oxygen difference
- Detraining and VO<sub>2</sub> max
- Endurance training: effects on performance and homeostasis
- Endurance training: links between muscle and system physiology
- Physiological effects of strength training
- Physiological mechanisms causing increased strength.

### **PHYSIOLOGY OF HEALTH AND FITNESS**

#### **WORK TESTS TO EVALUATE CARDIO RESPIRATORY FITNESS**

- Cardio respiratory fitness
- Testing procedures
- FIELD Tests for estimating CRF
- Graded exercise tests: measurements
- VO<sub>2</sub> max
- Graded exercise tests: protocols.

#### **EXERCISE PRESCRIPTION FOR HEALTH AND FITNESS**

- Prescription of exercise
- General guidelines for improving
- Exercise prescription for CRF
- Sequence of physical activity
- Strength and flexibility training.



## **EXERCISE FOR SPECIAL POPULATIONS**

- Diabetes
- Asthma
- Chronic obstructive pulmonary disease
- Hypertension
- Cardiac rehabilitation
- Exercise for older adults
- Exercise during pregnancy.

## **PHYSIOLOGY OF PERFORMANCE FACTORS AFFECTING PERFORMANCE**

- Sites of fatigue
- Factors limiting All-out anaerobic performances
- Factors limiting All-out aerobic performances

## **LABORATORY ASSESSMENT OF HUMAN PERFORMANCE**

- Laboratory assessment of physical performance
- Direct testing of maximal aerobic power
- Laboratory tests to predict endurance performance
- Determination of anaerobic power
- Evaluation of muscular strength

## **TRAINING OF PERFORMANCE**

- Training principles
- Components of a training session: warm-up, workout and cool down
- Training to improve aerobic power
- Injuries and endurance training
- Training for improved anaerobic power
- Training to improve muscular strength
- Training for improved flexibility
- Year-round conditioning for athletes
- Common training mistakes.

## **TRAINING FOR THE FEMALE ATHLETE, CHILDREN AND SPECIAL POPULATION**

- Factors important to women involved in vigorous training
- Sports conditioning for children
- Competitive training for diabetics
- Training for asthmatics
- Epilepsy and physical training.

## **LAB WORK**

- Predicting VO<sub>2</sub> max using the Harvard step test
- Ratings of perceived exertion and intensity of exercise
- Time limit test

- Predicting VO<sub>2</sub> max using Astrand Rhyming Momogram
- Determining maximal oxygen uptake using treadmill
- The effects of endurance and strength exercise on CV response
- Blood lactate sampling at rest and during exercise
- Determining onset of blood lactate accumulation and lactate threshold
- Assessing muscular efficiency
- The stretch reflex
- Stoop test

### **RECOMMENDED BOOKS**

1. Exercise Physiology- Theory and Application to Fitness and Performance by: Scott K. Powers, Edward T. Howley.
2. Exercise physiology, A thematic Approach By: Tudor Hale, University College Chichester, UK.
3. Additional study material as assigned by the tutor.

## **MOLECULAR BIOLOGY & GENETICS**

**CREDIT HOURS 2(2-0)**

### **COURSE DESCRIPTION**

This course covers the brief overview of the cellular & molecular biology, membrane physiology, introduction to molecular medicine and gene therapy, nuclear transplantation, gene therapy for neurological disorders, gene therapy for musculoskeletal disorders and the concept of molecular medicine in physical therapy.

This course has been designed to address a more in depth study of biology of inheritance and inheritance patterns. This course focuses on classical Mendelian genetics, the DNA molecule and molecular genetics, and population genetics. The course also covers Human genome and Molecular Pathology.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Exhibit knowledge of genetics, cell and molecular biology, and anatomy and physiology
3. Demonstrate the knowledge of common and advanced laboratory practices in cell and molecular biology
4. Engage in the review of scientific literature in the areas of molecular biology and genetics

### **Course Learning Objectives:**

1. Describe the interactions between the various systems of a cell, including the interactions between DNA (deoxyribonucleic acid), RNA (Ribonucleic acid) and protein biosynthesis as well as learning how these interactions are regulated
2. Describe the historical development of molecular biology and revolutionary events and their breakthrough occur in that era
3. Describe the application and theoretical aspects of various molecular techniques including, Polymerase Chain Reaction (PCR), expression cloning, Gel electrophoresis, macromolecule blotting, probing, arrays (DNA array and protein array) and recombinant technology
4. Describe the Mendelian laws of inheritance with examples to get an idea about the gene penetrance and inherent patterns

5. Describe theoretical aspects of gene therapy with recent advancement on how it could be utilized as a therapeutic procedure against various diseases with examples
6. Describe the basics of the molecular basis of inheritance which involves the study of genes, genetic variations, and heredity
7. Describe the basic concept of chromosomes and cell division (mitosis and meiosis)
8. Describe the principles of linkage analysis and positional cloning, modern autozygosity mapping uses SNP arrays or whole-genome sequence data
9. Describe the basic concept of chromosomal disorders and associated syndrome characterized by malformations or malfunctions in any of the body's systems
10. Describe human genetic diseases and disorders that are caused by mutations in one or more genes
11. Describe neurological disorders along with utilization of various molecular techniques in therapeutics and diagnostic procedures
12. Describe the introduction of bone development and regeneration and the application of gene therapy strategies for bone repurposing
13. Describe the introduction of Ligament and Tendon Growth Factors, Tendon rafts related clinical trials for Bone Replacement
14. Describe the basic concept of cartilage, cartilage related growth factors and cytokines for cartilage repair along with strategies for cartilage reparation by the application of gene delivery
15. Describe the role of intervertebral disc, formation of in vertebral disc, and treatment of related disorders by the application of gene therapy
16. Describe the introduction to the muscles along with molecular basis of myopathies and treatment strategies by using gene therapies

## **COURSE CONTENTS**

### **BRIEF REVIEW OF CELLULAR & MOLECULAR BIOLOGY**

- Structure and Functions of Cell, Nucliec Acid, Chromosomes & Proteins

### **INTRODUCTION TO MOLECULAR MEDICINE AND GENE THERAPY**

- Introduction
- Genetic Manifestations of Molecular Medicine
- Gene Therapy and Patterns of Gene Expression
- Gene Therapy and Molecular Medicine
- Gene Therapy: Current Basic Science Issues
- Human Gene Therapy: Current Status and Basic Science

### **GENE THERAPY FOR NEUROLOGICAL DISORDERS:**

- Introduction
- Sorting Out the Complexity of the Nervous System
- What Goes Wrong in Neurological Disorders
- Neurotrophic Factors and Gene Therapy
- Neural Transplants and Stem Cells
- Clinical Neurodegenerative Conditions
- Clinical Trials Testing Genetically Modified Cells and Neurotrophic Factors for Neurodegeneration:
- Stem Cell Therapy in Spinal Cord Injuries
- Future Considerations and Issues

### **GENE THERAPY FOR MUSCULOSKELETAL DISORDERS**

- Bone
  - Introduction:
  - Regulatory Factors in Bone Development and Regeneration:
  - Cells for Gene Therapy Strategies Directed Towards Bone Regeneration
  - In Vivo& Ex Vivo Gene Therapy Strategies for Bone
  - Clinical Trials for Bone Replacement
- Ligament and Tendon:
  - Introduction
  - Ligament and Tendon Growth Factors
  - Cells for Gene Therapy Strategies Directed Towards Ligament Regeneration
  - In Vivo &Ex VivoGene Therapy Strategies to Intact Ligament and Tendon
  - Gene Therapy Strategies for Lacerated Tendon Repair, promote Osseo-Integration of Tendon Grafts

- Clinical Trials for Ligament and Tendon Replacement.
- Cartilage:
  - Introduction
  - Growth Factors and Cytokines for Cartilage Repair and Regeneration
  - Cells for Gene Therapy Strategies Directed Towards Cartilage Regeneration
  - Gene Delivery Strategies for Cartilage Repair and Regeneration
  - Dose Dependency Detected with Cartilage Gene Therapies
  - Therapeutic Effects by Transfected Cells on Distal Joints
  - Transfected Xenogenic Cells for Cartilage Repair
  - Cartilage Tissue Engineering and Gene Therapy
- Intervertebral Disc
  - Introduction
  - The Biology of Intervertebral Disc Degeneration
  - Application of Gene Therapy in Intervertebral Disc
  - In Vivo& Ex Vivo Gene Therapy Strategies to Intervertebral Disc
  - Clinical Trials for Intervertebral Disc
- Muscles
  - Introduction
  - The Molecular Basis of Myopathies
  - In Vivo& Ex Vivo Gene Therapy Strategies in Myopathies
  - Clinical Trials in Myopathies
  - Gene Therapy: Ethical Issues at the Policy Level

### **A brief introduction to following topics**

- The chemistry of dna
- Dna replication and recombination
- Transcription, translation and protein synthesis
- Cell-based dna cloning
- Nucleic acid hybridization assays:
- Pcr, dna sequencing and in vitro mutagenesis:
- Organization of the human genome:
- Human gene expression:
- Instability of the human genome:
- Mutation and dna repair:
- Physical and transcript mapping:

## RECOMMENDED BOOKS

1. Molecular Medicine: Genomics to Personalized Healthcare, 3<sup>rd</sup> Edition by R. Trent. (Published in 2005 by Academic Press).
2. Principles of Molecular Medicine, 2<sup>nd</sup> Edition by Marshall S. Runge and Cam Patterson. (Published in 2006 by Humana Press).
3. Molecular Neuropharmacology: A Foundation for Clinical Neuroscience, 2<sup>nd</sup> Edition by Eric J. Nestler, Steven E. Hyman and Robert C. Malenka. (Published in 2008 by McGraw-Hill Professional).
4. Molecular Medicine: An Introductory Text, 3<sup>rd</sup> Edition by R. J. Trent. (Published in 2005 by Academic Press).
5. Molecular Biology of the Cell, 5<sup>th</sup> Edition by Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter. (Published in 2007 by Garland Science).
6. Human Molecular Genetics, 3<sup>rd</sup> Edition by Tom Strachan and Andrew Read. (Published in 2003 by Garland Science/Taylor & Francis Group).
7. Molecular Medicine for Clinicians, 1<sup>st</sup> Edition by Barry Mendelow, Michele Ramsay, Nanthakumar Chettyan and Wendy Stevens. (Published in 2008 by University Press).
8. Molecular Markers, Natural History and Evolution, 2<sup>nd</sup> Edition by John C. Avise. (Published in 2004 by Sinauer Associates).
9. —Molecular Pathology: The Molecular Basis of Human Disease, 1<sup>st</sup> Edition by William B. Coleman, and Gregory J. Tsongalis. (Published in 2009 by Academic Press).
10. Additional Study Material as assigned By the tutor.
11. Genetics: A Conceptual Approach, 3<sup>rd</sup> Edition by Benjamin Pierce (Published in 2007 by W. H. Freeman).
12. Human Molecular Genetics, 3<sup>rd</sup> Edition by Tom Strachan and Andrew P Read (Published in 2003 by Garland Science/Taylor & Francis Group).
13. Genetics-From Genes to Genomes, 3<sup>rd</sup> Edition by Hartwell, Hood, Goldberg, Reynolds, Silver and Veres (Published in 2006 by McGraw-Hill).
14. Additional Study Material, as assigned By the tutor.

## FIFTH SEMESTER

Sr.No.	Course Title	Credit Hours
<b>THIRD PROFESSIONAL YEAR</b>		
01	PATHOLOGY & MICROBIOLOGY I	2(2-0)
02	PHARMACOLOGY & THERAPEUTICS I	2(2-0)
03	PHYSICAL AGENTS & ELECTROTHERAPY I (Theory) PHYSICAL AGENTS & ELECTROTHERAPY I (Practical)	3(2-1)
04	THERAPEUTIC EXERCISES & TECHNIQUES (Theory) THERAPEUTIC EXERCISES & TECHNIQUES (Practical)	3(2-1)
05	BIOCHEMISTRY I	2(2-0)
06	BEHAVIORAL SCIENCES (PSYCHOLOGY & ETHICS)	2(2-0)
07	SUPERVISED CLINICAL PRACTICE I (Practical)	3(0-3)
08	UNDERSTANDING QURAN-IV	NON CH 1 HOUR/WEEK
<b>Total Credit Hours in Semester-5</b>		<b>`17</b>



## **PATHOLOGY & MICROBIOLOGY-I**

**CREDIT HOURS 2(2-0)**

### **COURSE DESCRIPTION**

The course will develop an understanding among students about the pathology of underlying clinical disease states and involving the major organ systems. Epidemiological issues will be presented and discussed. Students will use problem-solving skills and information about pathology and Microbiology to decide when referred to another health care provider or alternative intervention is indicated.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Discuss concepts of general pathology
3. Recognize signs and symptoms that are considered red flag for serious disease.
4. Discuss and disseminate pertinent information and findings and ascertain the appropriate steps to follow during physical therapy and its management.

### **Course Learning Objectives:**

2. Define pathology.
3. Discuss the core aspects of various diseases in pathology.
4. Define hyperplasia, hypertrophy, atrophy and metaplasia and list some of their causes
5. Describe the mechanism of necrosis
6. Describe the various types of necrosis and explain some of their causes.
7. Understand the process of inflammation
8. Comprehend the etiopathogeneses of granulomatous inflammation
9. Contrast the differences between acute and chronic inflammation
10. Describe the processes of healing
11. Understand and differentiate between the patterns of wound healing
12. Describe the factors that influence wound healing
13. Discuss the complications of wound healing
14. Explain how fluid balance is maintained across the arteriolar and venular end of the vasculature by Starling forces

15. Understand the cause and pathogenesis of clinical conditions associated with Infarction (Myocardial Infarction)
16. Understand the cause and pathogenesis of clinical conditions associated with Thrombosis (DVT and Pulmonary Thromboembolism)
17. Differentiate neoplastic lesions from non-neoplastic ones
18. Contrast benign from malignant tumors
19. Describe the methods and mechanisms of metastasis
20. Discuss the etiologic factors in carcinogenesis
21. Comprehend the clinical behavior of cancers
22. Understand the role of cancer suppressor genes and proto-oncogenes.
23. Understand the molecular basis of cancer
24. Describe the diagnostic modalities related to various types of cancers
25. Discuss epidemiological issues related to cardiovascular disorders
26. Discuss epidemiological issues related to respiratory disorders
27. Discuss epidemiological issues related to musculoskeletal disorders

## **COURSE CONTENTS**

### **GENERAL PATHOLOGY WHICH INCLUDES**

#### **CELL INJURY AND DEATH**

- Causes of cell injury
- Pathogenesis of necrosis and apoptosis
- Sub cellular responses

#### **CELL ADAPTATIONS**

- Relevant examples: Hyperplasia, Hypertrophy, Atrophy, Metaplasia and intracellular accumulation

#### **INFLAMMATION**

- Acute inflammation
- Vascular events and cellular events
- Chemical mediators

#### **CHRONIC INFLAMMATION**

- General and granulomatous inflammation
- Morphologic patterns of acute and chronic inflammation

#### **HEALING & REPAIR**

- Normal controls of healing and repair.
- Repair by connective tissue
- Wound healing

#### **HAEMODYNAMIC DISORDERS**

- Edema and its types
- Hyperemia /congestion, Hemorrhage, Thrombosis, Embolism, Infarction, Shock.

#### **DISEASES OF IMMUNITY**

- General features of immunity
- Hypersensitivity reactions
- Immune deficiencies.
- Autoimmunity
- Amyloidosis

## **NEOPLASIA**

- Nomenclature of neoplasia
- Molecular basis of neoplasia
- Carcinogenic agents of neoplasia
- Clinical aspects of neoplasia

## **MICROBIOLOGY**

### **THE BACTERIA**

- Bacterial cell structure, its forms and function
- Identification and classification of bacteria
- Gram stain

### **METHODS OF STUDYING MICRO-ORGANISM**

- Culturing, inoculation and identification
- Types of media
- Physical states of media

### **MICROBIAL GROWTH**

- Stages in the normal growth curve
- Microbial genetics
- Prokaryotic transcriptions and translations.
- Conjugations
- Mutation and its causes.
- Mechanism of drug resistances and its pathogenesis.
- Gateway to infection.
- Resident flora and its mechanism of invasions
- Classic stages of clinical infection
- Sterilization and disinfection.

### **RECOMMENDED BOOKS**

1. Goodman CC & Fuller KS. Pathology: implication for the Physical Therapist. 4th ed. Elsevier:USA;2015
2. Kumar V, Abbas AK, & Aster JC. Robbins basic pathology. 9th ed. Elsevier: Philadelphia; 2013.

3. Levinson W. review of medical microbiology & immunology. 14th ed. McGraw-Hill: Canada; 2016
4. Thomson AD & Cotton RE. Lecture notes on pathology. 3rd ed. FA Davis; 1983

## **PHARMACOLOGY & THERAPEUTICS- ICREDIT HOURS      2(2-0)**

### **COURSE DESCRIPTION**

This course deals with pharmacodynamics, pharmacokinetics, clinical/therapeutic uses and toxicology of drugs. Emphasis is given on how a drug works to anticipate when giving a drug to a patient are of paramount importance include administering drugs, calculating medication dosages based on given setting, assessing drug effects, intervening to make a drug more tolerable, and providing teaching about drugs and the drug regimen.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Compare and contrast the physiological mechanisms by which individual drugs affect different organ systems in the body
3. Evaluate drug side effects and differentiate these side effects from the symptoms of the patient's disease(s)
4. Comprehend the capacity for addiction and withdrawal in drugs with those potentials and recognize addictive and withdrawal behaviors in patients exhibiting corresponding signs
5. Assess situations where drug levels are too high versus too low (i.e., increased drug toxicity versus decreased efficacy)
6. Judge the potential for harmful interactions between specific drugs and various physical therapy interventions
7. Choose appropriate physical therapy interventions in accordance with the client's drug regimen

### **COURSE LEARNING OBJECTIVES:**

1. Provide the physical therapist with knowledge of pharmacology theory and its application to physical therapy
2. Understanding of pharmacological agents used in modern medicine and its importance to the practice of physical therapy
3. Evaluate the scientific evidence in evaluating the use and effectiveness of pharmacological intervention

4. Compare and contrast general categories of drugs that are therapeutically utilised for specific diseases and dysfunctions within the body
5. Integrate pharmacokinetic principles with pharmacodynamics and judge how drug effects are influenced by their administration, absorption, distribution, storage, and metabolism in the body
6. Summarize pharmacological effects on body systems

## **COURSE CONTENTS**

### **GENERAL PRINCIPLES OF PHARMACOLOGY**

- Various principal of pharmacology
- Introduction to pharmacokinematics
- Various drug dosage forms and pharmacological doses
- Various routes of drug administration and their advantages/ disadvantages
- Factors modifying drug absorption and distribution
- Major mechanisms responsible for drug metabolism
- Factors modifying drug metabolism
- Basic principles of drug excretion
- Factors modifying drug excretion
- Various mechanisms by which drugs exert their effects
- Various types of pharmacological graphs
- Identification of the therapeutic index and therapeutic window on a given dose response curve

### **DRUG USED TO TREAT PAIN AND INFLAMMATION**

- Therapeutic uses of opioid analgesics.
- Classification of non-steroidal anti-inflammatory drugs on the basis of mechanism of action.
- Pharmacological management of rheumatoid and osteoarthritis.
- Patient control analgesia

### **PHARMACOLOGY OF CENTRAL NERVOUS SYSTEM**

- Classification of the drugs, which modulate the central Nervous System according to their general principles, selectivity, specificity and mode of action.
- Pharmacokinetics, clinical uses, contraindications, adverse effects and toxicity of drugs acting on above receptor system
- Sedative, hypnotic and anxiety agents
- Drugs used to treat effective disorders depression and manic depression.
- Antipsychotic and antiepileptic drugs

- Pharmacologic management of Parkinson disease
- General and local anesthetics

### **DRUGS AFFECTING SKELETAL MUSCLE**

- Skeletal Muscle Relaxants

### **AUTONOMIC AND CARDIOVASCULAR PHARMACOLOGY**

- Introduction to Autonomic Pharmacology
- Cholinergic, Adrenergic and Antihypertensive Drugs
- Treatment of Angina Pectoris
- Treatment of Cardiac Arrhythmias
- Treatment of Congestive Heart Failure
- Treatment of Coagulation Disorders and Hyperlipidemia

### **RECOMMENDED BOOKS**

1. Ciccone CD. Pharmacology in rehabilitation. 5th ed. United states: Cardiopulmonary Perspectives in Rehabilitation; 2015.
2. Whalen K, Finkel R & Panavelli TA, editors. Lippincott illustrated reviews: pharmacology. 6th ed. Philadelphia: Wolters Kluwer; 2015
3. Cheema M. multi author textbook of pharmacology and therapeutics. Lahore: National Medical Publication; 2015: 1.
4. Cheema M. multi author textbook of pharmacology and therapeutics. Lahore: National Medical Publication; 2015: 2

## **PHYSICAL AGENTS & ELECTROTHERAPY-I CREDIT HOURS 3(2-1)**

### **COURSE DESCRIPTION**

This course deals with the Physical principle associated with Electrotherapy and methods used in the field of Physical Therapy.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Discuss in detail the information about the physiological and therapeutic uses, risks, preventions and knowledge of indications and contraindications on the type of electric current to be used in different disorders
3. Demonstrate fundamental skills that will be used to train in electrotherapy modalities according to the need of patient

### **Course Learning Objectives:**

1. Understand electrotherapy, differentiate between electric currents, electromagnetic radiation, mechanical wave, and other physical agent used in physical therapy
2. Define and explain all types of currents for therapeutic purposes
3. Describe and explain the physiological effects of all currents used in therapy
4. Explain in detail the therapeutic uses of different currents and their indications and contraindications
5. Understand and demonstrate the method of application of all currents skillfully on models
6. Clearly understand the adverse effects of different currents and its remedy for patients
7. Understand and demonstrate the correct selection of current for different conditions and practically demonstrate the application of therapeutic currents in lab
8. Demonstrate effective skills at the safe use of currents on patients.

### **COURSE CONTENTS**

#### **INTRODUCTION&GENERALCONSIDERATIONOF ELECTROTHERAPY**

- Electrotherapy.
- Types of currents and its parameters.
- Identification of the safety rules for using electrical currents.
- Background with respect to RMP, nerve impulse, electrical charges of nerve and tissues.
- Healing process.
- Application of the energy to the body for therapy.
- List of the risks, preventions and knowledge of indications and contraindications.

## **TYPES OF CURRENT USED**

- Low frequency current
- Medium frequency current

## **LOW FREQUENCY CURRENT**

- Faradic current
- Sinusoidal current
- Galvanic current
  - constant galvanic current
  - modified galvanic current
- Superimposed currents
- Transcutaneous Electrical Nerve Stimulation (TENS)
- Dia-Dynamic currents

## **TRANSCUTANEOUS ELECTRICAL NERVE STIMULATOR (TENS)**

- TENS
- Characteristics of TENS
- Modes, pain theories, pain modulation and technique of application of TENS
- Therapeutic uses, contraindications and dangers of TENS
- Clinical method of application and dosage

## **FARADIC AND FARADIC TYPE CURRENT**

- Faradic and Faradic type current.
- Explain true Faradic current
- Therapeutic effects, mode of applications, contraindications and dangers of Faradic current?
- Clinical method of application and dosages of Faradic current

## **SINUSOIDAL CURRENT**

- Detailed description of sinusoidal current
- Treatment
- Methods of application

## **GALVANIC DIRECT CURRENT AND INTERRUPTED DIRECT CURRENT (DC & IDC)**

- Galvanic Current & IDC.
- Production and transmission of galvanic & IDC.
- Effects, uses, contraindications and dangers of DC & IDC.
- Dosages and clinical methods of application of DC & IDC

## **MODIFIED GALVANIC CURRENT**

- Modified galvanic currents
- Physical and Therapeutic effects
- Uses
- Treatment techniques & methods of application
- Electrical stimulation of nerve & muscle



- Nerve impulse
- Property of accommodation
- Electrical Reactions
- Normal & abnormal reactions of nerve & muscle to faradism & interrupted direct current
- Changes in electrical reaction in Upper motor and Lower motor neurons and Muscular disease

### **DIDYNAMIC CURRENT**

- Didynamic current
- Explain characteristics, derivatives and effects of Didynamic current
- Explain the technique of application, therapeutic uses, contraindications and dangers
  - Example: Sprain ankle, Sciatica. Facial neuralgia. Trigeminal neuralgia & Otitis media
- Clinical method of application and dosage

### **MEDICAL IONIZATION**

- Describe Theory& proof of ionization
- Discuss Effects of various ions; iodine, salycylate, albucid, copper, zinc histamine, carbacol, renotinenovocaine, lithium
- Describe Techniques of medical ionization with vasodilator drugs
- Discuss Techniques for special areas.

### **ELECTRO-DIAGNOSTICS**

- What are the use of electrical changes in evaluation and diagnosis?
- What are Faradic & I. D. C test
- What is Accomodity test
- Explain the physiological changes in Peripheral nerve.
- Give an assessment of nerve and muscle potential.
- What do you about Electromyography? Explain briefly.
- Give an assessment by observing the results of stimulating nerve and muscle.
- Explain muscle contraction.
- Give SDCT (Strength Duration Curve Test).
- Explain Evoked potentials.

### **MEDIUM FREQUENCY CURRENT**

- Define Russian current,
- Explain the technique of application, contraindications and dangers of Russian current.
- Explain clinical method of application and dosage
- Define IFC,
- What are the characteristics, effects, technique of application and therapeutic uses
- Explain the contraindications, dangers and clinical method of application of IFC.

### **SUPER IMPOSED CURRENT**

- Give Introduction

- Definition
- Describe Effects & uses, Technique, Methods, Dangers and Precautions

### **HIGH VOLTAGE CURRENT (HVC)**

- Define HVC, Explain the characteristics, effects and uses of HVC.
- Explain the technique of application of HVC.
- What are the contraindications and dangers of HVC
- What is the clinical method of application and dosage of HVC

### **HIGH FREQUENCY CURRENTS**

- Introductions of high frequency currents
- Describe Productions of high frequency currents
- Describe Uses, indication, contraindications & methods of applications of high frequency currents

### **LAB WORK**

- Location of motor points
- Faradic & I.D.C test
- Strength duration curve, determination of Rheobase and Chronaxie
- Accommodate test
- Electromyography
- Definition, method, value, uses of E.M.G, Electromyography & temperature, feedback techniques
- Practical application of TENS in physical therapy treatment
- Reflective clinical case studies
- Iontophoresis
- Demonstration of techniques during practical classes, later on techniques practiced by students on patients attending the department under supervision of trained physiotherapists.

### **Note**

The students are expected to make a record of his/her achievements in the log book. The log book is a collection of evidence that learning has taken place. It is a reflective record of achievements. The log book shall also contain a record of the procedures which student would have performed/observed

### **RECOMMENDED BOOKS**

1. Savage B. Practical electrotherapy for physiotherapists. UK: Faber; 1960.
2. Scott PM. Clayton's electrotherapy and actinotherapy. 7th ed. USA: Williams & Wilkins; 1980.
3. Watson T. Electrotherapy: evidence-based practice. 12th ed. Edinburgh: Churchill Livingstone; 2008
4. Cameron MH. Physical agents in rehabilitation: from research to practice. 4th ed. St. Louis: Elsevier; 2013.
5. Singh J. Textbook of electrotherapy. 2nd ed. India: Jaypee; 2012

## **THERAPEUTIC EXERCISES & TECHNIQUES      CREDIT HOURS    3(2-1)**

### **COURSE DESCRIPTION**

This course presents anatomical and physiological principles to allow students to develop integrated therapeutic exercise interventions. Students have the opportunity to develop an acquired understanding of physiological responses to various types of training and develop skills in prescription, implementation, and modeling of exercise programs. Exercise components of strength, aerobic/anaerobic conditioning, flexibility, balance and stage of healing/rehabilitation are examined. Evidence of appropriate, safe and effective exercise design and proper exercise biomechanics and prescription parameters are addressed with all interventions. Exercise considerations for special populations and across the age span are covered. Concepts are presented in lecture and practiced in the laboratory.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Defines and explain the different types of physical therapy techniques and exercises
3. Demonstrate the best practices associated with injury and its rehabilitation
4. Discuss strategies to improve movement and function, relieve pain and extend mobility potential

### **Course Learning Objectives:**

1. Understand the relationship between clinical decision making and patient management
2. Understand the term ROM, its application in different conditions
3. Understand stretching and its application
4. Understand the passive range of motion techniques and its understanding of applications at various levels
5. Understand active resisted exercises and its interventions and equipment used for resistance
6. Principles of aerobic conditioning with its special considerations
7. Understand aquatic exercises, its special considerations and exercise interventions in the aquatic environment
8. Lab work, hands on skills and clinical cases on the above-mentioned topics is compulsory.

### **COURSE CONTENTS**

#### **THERAPEUTIC EXERCISE: FOUNDATIONAL CONCEPTS**

- Define Therapeutic exercise: impact on physical function
- Discuss Process and models of disablement
- Discuss Patient management and clinical decision making: an Interactive relationship

- Discuss Strategies for effective exercise and task-specific Instruction.

## **APPLIED SCIENCE OF EXERCISE AND TECHNIQUES**

- Define Range of motion, Types of ROM exercises, its Indications and goals.
- Discuss Limitations of ROM exercises with Precautions and contraindications.
- Describe Principles and procedures for applying ROM Techniques: Self-assisted ROM, continuous passive motion and ROM through functional patterns.

## **STRETCHING FOR IMPAIRED MOBILITY**

- Define terms related to mobility and stretching
- Discuss Properties of soft tissue—response to immobilization and stretch
- Discuss determinants, types, and effects of stretching interventions
- Describe Procedural guidelines for application of stretching interventions
- Explain Precautions during stretching
- Discuss Adjuncts to stretching interventions
- Explain Manual stretching techniques in anatomical planes of motion.

## **PERIPHERAL JOINT MOBILIZATION**

- Define terms: mobilization/manipulation, self-mobilization (auto-mobilization), mobilization with movement, physiological movements, accessory movements, thrust, manipulation under anesthesia, muscle energy
- Discuss Basic concepts of joint motion: arthro kinematics
- Discuss Indications and Limitations of joint mobilization techniques with its contraindications and precautions
- Discuss Procedures for applying passive joint mobilization techniques
- Discuss Mobilization with movement: principles of application
- Discuss Peripheral joint mobilization techniques including Shoulder Girdle Complex, Elbow and Forearm Complex, Wrist Complex, Hand and Finger Joints, Hip Joint, Knee and Leg, Ankle and Foot Joints.

## **RESISTANCE EXERCISE FOR IMPAIRED MUSCLE PERFORMANCE**

- Define Muscle performance
- Discuss types of resistance exercise with its guiding principles
- What are Determinants of a resistance exercise program
- Discuss General Principles of Resistance Training with Precautions For and Contraindications to resistance exercise
- Define Manual resistance exercise with its guidelines
- What are Physiological changes that occur with training
- Discuss Skeletal muscle function and its adaptation to resistance exercise
- Discuss special considerations, techniques with general background for upper extremity and lower extremity

- Describe Proprioceptive neuromuscular facilitation, its principles, procedures and basic and specific Techniques
- Discuss Diagonal patterns of PNF with reference to upper and lower extremity.
- Discuss Mechanical resistance exercise and its use in rehabilitation, conditioning programs with special considerations for children and older adults
- Discuss Selected resistance training regimens
- Discuss Equipment for resistance training

### **PRINCIPLES OF AEROBIC EXERCISE**

- Discuss Application of principles of an aerobic conditioning program for the patient with coronary disease for both inpatients and multiple phases of outpatient
- Discuss special considerations and adaptive changes
- Discuss Applications of aerobic training for the de-conditioned individual and the patient with chronic illness in different Age group.

### **AQUATIC EXERCISE**

- Define aquatic exercises with its Background and principles,
- identify Goals, indications, Precautions and contraindications to aquatic exercise
- Discuss Properties of water, Aquatic temperature and therapeutic exercise
- What are the Special equipment for aquatic exercise
- Discuss Exercise interventions using an aquatic environment such as stretching exercises, Strengthening Exercises and Aerobic Conditioning.

### **LAB WORK**

- Hands on skills of the following techniques:
- Range of Motion,
- Stretching
- Resisted exercise
- Peripheral joint mobilization.
- Aerobic exercises
- Balance training
- Hydrotherapy
- Reflective clinical case studies
- Supervised and independent applications of therapeutic techniques on patients in outdoor and indoor physiotherapy treatment settings.

### **Note**

The students are expected to make a record of his/her achievements in the log book. The log book is a collection of evidence that learning has taken place. It is a reflective record of achievements. The log book shall also contain a record of the

procedures which student performs/observes during course of study

### **RECOMMENDED BOOKS**

1. Kisner C & Colby LA. Therapeutic exercise: foundations & techniques. 6<sup>th</sup> ed. Philadelphia: FA Davis; 2012.
2. Bandy WD & Sanders B. Therapeutic Exercise for physical therapist assistants: techniques for intervention. 3<sup>rd</sup> ed. Wolters Kluwer; 2012.
3. Sullivan PE and Markos PD. Clinical decision making in therapeutic exercise. Appleton & Lange; 1994.
4. Connolly BH & Montgomery P. Therapeutic exercise in developmental disabilities. 3<sup>rd</sup> ed. Slack; 2004.

## **BIOSTATISTICS-I**

**CREDIT HOURS 3(3-0)**

### **COURSE DESCRIPTION**

It involves selection of appropriate statistical techniques to address questions of medical relevance; select and apply appropriate statistical techniques for managing common types of medical data; use various software packages for statistical analysis and data management; interpret the results of statistical analyses and critically evaluate the use of statistics in the medical literature; communicate effectively with statisticians and the wider medical community, in writing and orally through presentation of results of statistical analyses; explore current and anticipated developments in medical statistics.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Demonstrate the basics of Biostatistics till measure of dispersion as described in curriculum

### **Course Learning Objectives:**

1. Understand biostatistics and its applications, population and sample
2. Define types of data and its collection methods
3. Design frequency tables
4. Create graphs and charts
5. Measurement of central tendency
6. Measurement of dispersion
7. Perform sampling methods and techniques

### **COURSE CONTENTS**

- At the end of the course the student should be able to understand:

### **STATISTICS**

- Define Statistics, Population, sample Descriptive and inferential Statistics, Observations, Data, Discrete and continuous variables, Errors of measurement, Significant digits, Rounding of a Number, Collection of primary and secondary data, Sources, Editing of Data. Exercises.

### **PRESENTATION OF DATA**

- Introduction, basic principles of classification and Tabulation, Constructing of a frequency distribution, Relative and Cumulative frequency distribution, Diagrams, Graphs and their Construction, Bar charts, Pie chart, Histogram, Frequency polygon and Frequency curve,

Cumulative Frequency Polygon or Ogive, Histogram, Ogive for Discrete Variable. Types of frequency curves. Exercises.

### **MEASURES OF CENTRAL TENDENCY**

- Explain Different types of Averages, Quantiles, The Mode, Empirical Relation between Mean, Median and mode, Relative Merits and Demerits of various Averages. Properties of Good Average, Box and Whisker Plot, Stem and Leaf Display, definition of outliers and their detection. Exercises.

### **MEASURES OF DISPERSION**

- Describe Absolute and relative measures, Range, The semi-Inter-quartile Range, The Mean Deviation, The Variance and standard deviation, Change of origin and scale, Interpretation of the standard Deviation, Coefficient of variation, Properties of variance and standard Deviation, Standardized variables, Moments and Moments ratios. Exercises.

### **PROBABILITY AND PROBABILITY DISTRIBUTIONS**

- Define Discrete And Continuous Distributions: Binomial, Poisson And Normal Distribution. Exercises.

### **SAMPLING AND SAMPLING DISTRIBUTIONS**

- Describe sample design and sampling frame, bias, sampling and non-sampling errors, sampling with and without replacement, probability and non-probability sampling, Sampling distributions for single mean and proportion, Difference of means and proportions. Exercises.

### **RECOMMENDED BOOKS**

1. Walpole RE. Students study guide: introduction to statistics. 3rd ed. 1982.
2. Muhammad F. Statistical methods and data analysis. Faisalabad: KitabMarkaz; 2000
3. R. L Ott, Micheal T longnecker. An introduction to statistical methods and data analysis, 7th ed. Brooks/Cole, Cengage Learning 2015



**BEHAVIOURAL SCIENCES (PSYCHOLOGY & ETHICS)**  
**CREDIT HOURS 2(2-0)**

**COURSE DESCRIPTION**

- This course is designed to increase awareness of psychosocial issues faced by individuals and their significant reference groups at various points on the continuum of health and disability. Personal and professional attitudes and values are discussed as they relate to developing therapeutic relationships. Communication skills are emphasized for effective interaction with clients, health-care professionals and others.

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Define behavioral sciences and its importance in health
3. Demonstrate bio-psycho-social model of health care and the systems approach, normality vs abnormality, importance of behavioral sciences in health, desirable attitudes in health professionals understanding behavior

**COURSE LEARNING OBJECTIVES:**

1. Conducting diagnostic interviews
2. Formulating and clarifying diagnostic findings and treatment recommendations
3. Documenting evaluation and treatment procedures, involving duties such as recording results of diagnostic interviews, lab studies and/or treatment plans in a timely way according to the medical records protocols of the rotation site
4. Explain psychological and ethical factors that influence values about health promotion, wellness, illness and disability
5. Demonstrate skills to effective physical therapist-client relationship for better health care outcomes.

**COURSE CONTENTS**

**INTRODUCTION OF BEHAVIORAL SCIENCES**

- Define Behavioral Sciences
- Discuss its importance in health
- Discuss Bio-Psycho-Social Model of Healthcare

**BEHAVIOR OF INDIVIDUAL**

- Nature/nurture debate
- Behaviorism and learning theories

- Behavioral modifications

## **COGNITION**

- cognition
- cognitive development throughout lifespan

## **SCIENCE OF RELATIONSHIP**

- Define and discuss communication skills, its types, modes, barriers and factors affecting
- Discuss Counseling: steps, scope, indication and contraindications in health setting
- Discuss conflict management: Dealing with real life crisis and conflict situations in health settings
- Discuss interviewing and its psychosocial factors in health care.
- Define clinician-patient / client relationship
- Discuss Concept of boundaries and psychological reactions in clinician – patient relationship such as transference and counter transference.
- Discuss Problem solving and decision making strategies in health care

## **STRESS MANAGEMENT**

- Define and classify of stress
- Discuss effects of stress on health and coping strategies
- Discuss Relationship of stress and stressors with illness
- Define Anxiety
- Discuss Psychological defense mechanisms, Adjustment and maladjustment

## **APPLICATION OF BEHAVIORAL PRINCIPLES IN HEALTH AND DISEASE**

- Importance of psychological consideration in physical therapy management of
  - Mentally, emotionally and physically compromised patients
  - Terminally ill and home bound patients

## **ETHICS**

- Define ethics, medical ethics, and values, value system, virtues, mores, moral rules and morality
- Discuss ethical theories
- Discuss principle based approach for physical therapist in ethics such as;
  - Non-maleficence, beneficence, autonomy, fidelity, veracity, paternalism, and Justice.
- Discuss code of ethics for physical therapist
- Discuss ethical dimension of the physical therapist patient relationship, confidentiality, information sharing, and informed consent and ethical dilemmas.

### **RECOMMENDED BOOKS**

1. Rana MH, Ali S & Mustafa M. A handbook of behavioral sciences for medical and dental students. 2nd ed. Lahore: university of health sciences; 2013.
2. Dowrick C. Medicine in society: behavioral sciences for medical students. CRC Press; 2001
3. Billingham KA, Feldman HS & Lopez MA. Developmental psychology for health care profession. Michigan: westviewpress; 1982.
4. Purtilo RB & Doherty RF. Ethical dimensions: in the health professions. 6th ed. St. Louis: Elsevier; 2016
5. Veatch RM. Medical ethics. 2nd ed. USA: Jones & Bartlett. 1997

**SUPERVISED CLINICAL PRACTICE-I****CREDIT HOURS 3(0-3)****HISTORY TAKING**

SEMESTER	SUPERVISION	FOCU	WARDS	COMPETENCIE
5	Supervised by Trained PT	History Taking	All wards	As listed below

**COURSE DESCRIPTION**

During this supervised clinical practice, students are responsible for learning the art of history taking, the first interaction with patient. Students learn the skills under supervision of trained physical therapists. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of patients (surgical, non-surgical, pediatric, geriatric, etc.).

The emphasis is placed on general history taking skills as well as its pertinence to all systems (musculoskeletal, Integumentary, cardiovascular, pulmonary, and neurological.) Student is required to keep a performance record of all listed competencies and successfully perform on real patients during the final evaluation of the course.

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Learn the art of history taking, the first interaction with a patient, become familiar with the performance of these skills in all settings (in-patient and out-patient) as well as on all types of patients (surgical, non-surgical, pediatric, geriatric, etc.)

**Course Learning Objectives:**

1. Demonstrate history taking of the patient in SOAP format and the ability to communicate with their patient as well as their relatives
2. Demonstrate history taking skills
3. Demonstrate the history taking of the body systems (musculoskeletal, Integumentary, cardiovascular, pulmonary, and neurological.)

**CLINICAL COMPETENCIES**

- Review pertinent medical records and conduct an interview which collects the following data:
- Past and current patient/client history

- Demographics
- General health status
- Chief complaint
- Medications
- Medical/surgical history
- Social history
- Present and pre-morbid functional status/activity
- Social/health habits
- Living environment
- Employment
- Growth and development
- Lab values
- Imaging
- Consultations
- Documentation of the history.

**Note**

It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical logbook duly checked and signed by clinical supervisor on weekly basis and head of institute at completion.

## SIXTH SEMESTER

Sr.No.	Course Title	Credit Hours
01	PATHOLOGY & MICROBIOLOGY II (Theory) PATHOLOGY & MICROBIOLOGY II (Practical)	3(2-1)
02	PHARMACOLOGY & THERAPEUTICS II	2(2-0)
03	PHYSICAL AGENTS & ELECTROTHERAPY -II (Theory) PHYSICAL AGENTS & ELECTROTHERAPY -II (Practical)	3(2-1)
04	BIOCHEMISTRY II (Theory) BIOCHEMISTRY II (Practical)	3(2-1)
05	COMMUNITY MEDICINE & REHABILITATION	3(3-0)
06	SUPERVISED CLINICAL PRACTICE II (Practical)	3(0-3)
07	UNDERSTANDING QURAN-V	NON CH 1 HOUR/WEEK
<b>Total Credit Hours in Semester-6</b>		<b>17</b>

## **PATHOLOGY & MICROBIOLOGY-II**

**CREDIT 3(2-1)**

### **COURSE DESCRIPTION**

This course will cover the basic concepts, terminology, etiology, and characteristics of pathological processes. The course includes the diseases of the Integumentary System, Cardiovascular System, the Lymphatic System, the Respiratory System, the Nervous System, and Pathology of the musculoskeletal System, Pathology of Aging and medical microbiology. Also help the student to provide with a working knowledge of clinical pathology lab importance in Physical Therapy

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Describe the consequences of pathologic processes on the structure and function of the human body
3. Discuss selected disorders/diseases common to acute care in physical therapy
4. Explain the normal structure and function, in relation to disease processes in physical therapy

### **Course Learning Objectives:**

1. Determine the pathophysiology and different presentations of ischemic heart disease
2. Define congestive heart failure and recognize the differences between left vs right heart failure
3. Identify the pathophysiologic characteristics and presentation of the various valvular heart diseases
4. Differentiate the pathophysiologic characteristics of the most common congenital heart diseases
5. Classify the different cardiomyopathies according to clinical presentation
6. Outline the clinical characteristics of carcinoid heart disease, cardiac tumors and pericardial diseases
7. Explain information related to obstructive and restrictive lung diseases
8. Differentiate between obstructive and restrictive lung diseases
9. Understand the different types and clinical presentations of lung cancer with a focus on histopathology
10. Describe the different types of occupational lung diseases and their prognosis
11. Discuss in detail the pathology related to infectious diseases of the lungs
12. Explain information related to diseases of the pleural cavity

13. Explain information related to demyelinating disorders
14. Describe CNS tumors in detail
15. Understand the different types of inflammatory myopathies and neuropathies
16. Discuss the etiology and pathogenesis of vascular diseases of CNS
17. Discuss the etiology and pathogenesis of infectious diseases of CNS
18. Describe the pathophysiology of rheumatoid arthritis
19. Discuss the pathophysiology of systemic lupus erythematosus
20. Contrast between the different types of arthritis and bone disorders
21. Discuss in detail the pathogenesis and treatments of different types of bone tumors
22. Differentiate between the pathophysiology of different types of muscular dystrophies.

## **COURSE CONTENTS**

### **THE INTEGUMENTARY SYSTEM**

- Skin Lesions
- Signs and Symptoms of Skin Disease
- Aging and the Integumentary System
- Common Skin Disorders
- Skin Infections
- Skin Cancer
- Skin Disorders Associated With Immune Dysfunction
- Thermal Injuries
- Miscellaneous Integumentary Disorders.

### **THE CARDIOVASCULAR SYSTEM**

- Signs and Symptoms of Cardiovascular Disease
- Aging and the Cardiovascular System
- Gender Differences and the Cardiovascular System
- Diseases Affecting the Heart Muscle
- Disease Affecting the Cardiac Nervous System
- Diseases Affecting the Heart Valves
- Diseases Affecting the Pericardium
- Diseases Affecting the Blood Vessels
- Other Cardiac Considerations.

### **THE LYMPHATIC SYSTEM**

- Anatomy and Physiology
- Inflammation and Infection in the Lymphatic System.

### **THE RESPIRATORY SYSTEM**



- Aging and the Pulmonary System
- Infectious and Inflammatory Diseases
- Obstructive Diseases
- Environmental and Occupational Diseases
- Near Drowning
- Congenital Disorders
- Parenchymal Disorders
- Disorders of the Pulmonary Vasculature
- Disorders of the Pleural Space

## **PATHOLOGY OF THE MUSCULOSKELETAL SYSTEM**

### **INTRODUCTION TO PATHOLOGY OF THE MUSCULOSKELETAL SYSTEM**

- Advances in Musculoskeletal Biotechnology
- Biologic Response to Trauma
- Aging and the Musculoskeletal System
- The Musculoskeletal System and Exercise
- Musculoskeletal System Disease.

### **METABOLIC DISORDERS**

- Osteoporosis
- Osteomalacia
- Paget's disease.

### **INFECTIOUS DISEASES OF THE MUSCULOSKELETAL SYSTEM**

- Osteomyelitis
- Infections of Prostheses and Implants
- Diskitis
- Infectious (Septic) Arthritis
- Infectious (Inflammatory) Muscle Disease
- Extra pulmonary tuberculosis
- Summary of Special Implications for the Therapist.

### **MUSCULOSKELETAL NEOPLASMS**

- Primary Tumors
- Primary Benign Bone Tumours
- Primary Malignant Bone Tumours
- Multiple Myeloma
- Primary Soft Tissue Tumours
- Metastatic Tumours.

### **SOFT TISSUE, JOINT AND BONE DISORDERS**

- Soft Tissue
- Joint
- Bone.

## **PATHOLOGY OF THE NERVOUS SYSTEM**

### **INTRODUCTION TO CENTRAL NERVOUS SYSTEM DISORDERS**

- Overview
- Pathogenesis
- Clinical Manifestations
- Diagnosis
- Treatment
- Prognosis.

### **INFECTIOUS DISORDERS OF THE CENTRAL NERVOUS SYSTEM**

- Overview
- Meningitis
- Encephalitis
- Brain Abscess
- Prion Disease.

### **CENTRAL NERVOUS SYSTEM NEOPLASMS**

- Primary Brain Tumours
- Specific Primary Brain Tumours
- Primary Intraspinal Tumours
- Metastatic Tumours
- Paraneoplastic Syndromes
- Leptomeningeal Carcinomatosis
- Pediatric Tumors.

### **DEGENERATIVE DISEASES OF THE CENTRAL NERVOUS SYSTEM**

- Amyotrophic Lateral Sclerosis
- Alzheimer's Disease, Alzheimer's Dementia, and Variants
- Dystonia
- Huntington's Disease
- Multiple Sclerosis
- Parkinsonism and Parkinson's disease

### **STROKE**

- Stroke
- Vascular Disorders of the Spinal Cord.

### **MEDICAL MICROBIOLOGY**

#### **G +VE COCCI**

- Staphylococci
- Streptococci.

#### **G -VE COCCI**

- Neisseria.

## **G +VE SPORE FORMING RODS**

- Bacillies
- G –ve rods (introduction to Enterics)

## **ACID FAST BACILLI**

- Mycobacteria.

## **SPIROCHETES**

- Introduction
- Treponemes.

## **BASIC VIROLOGY**

- General characteristics
- Viral structure
- Nomenclature and classification.

## **MYCOLOGY**

- Introduction to mycology.

## **PARASITOLOGY**

- Introduction to protozoan.

## **LAB WORK**

- To study the microscope
- To study the calcification
- To study the osteogenic sarcoma
- To study the granulation tissue
- To study the chronic inflammation (cholecystitis)
- To study the acute inflammation (appendicitis)
- To Fibroedenoma
- To study the carcinoma of breast
- To study the actinomycosis
- To study the culture media
- To study the gram staining
- To study the Z-N staining
- To study the giant cell tumour
- Examination of urine.

## **RECOMMENDED BOOKS**

1. *Pathology: implications for the Physical therapist* by: Catherine Cavallaro Goodman, 4<sup>th</sup> edition
2. *Basics & advanced Human Pathology* by Robbins 9<sup>th</sup> edition
3. *Lecture notes on Pathology* by Thomas and Cotton Published by Blackwell Scientific Publications, Oxford
4. *General Pathology* by Lord Horward Florey 4<sup>th</sup> edition by Lloyd-Luke (Medical Books) Ltd

5. *Medical Microbiology and Immunology* By: Levinson and Jawetz, 9th Ed., Mc Graw-Hill.

**PHARMACOLOGY & THERAPEUTICS-II CREDIT HOURS 2(2-0)**  
**COURSE DESCRIPTION**

This course is designed to acquaint the students with the study of properties, effects, and therapeutic value of the primary agents in major drug categories. The topics include pharmacology of the respiratory system, gastrointestinal system, treatments of infectious diseases, and the drugs used in iontophoresis and phonophoresis

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Identify a range of drugs used in medicine and discuss their mechanisms of action
3. Report the clinical applications, side effects and toxicities of drugs used in medicine
4. Observe and understand the therapeutic effects and adverse effects of these drugs on each patient
5. Choose the appropriate physical therapy interventions in accordance with the client's drug regimen

**Course Learning Objectives:**

1. Demonstrate knowledge of basic clinical skills required to meet the skills objectives, including interviewing, physical diagnosis, communication and clinical reasoning processes
2. Understand the properties of drugs and the ways in which these properties react
3. Describe the pharmacology of prescription drugs used for pain, abuse and overdose issues associated with the use of medications.

**COURSE CONTENTS**

**RESPIRATORY AND GASTROINTESTINAL PHARMACOLOGY**

- Respiratory drugs
- Gastrointestinal Drugs.

**ENDOCRINE PHARMACOLOGY**

- Introduction to Endocrine Pharmacology
- Adrenocorticosteroids
- Male and Female hormones
- Thyroid and Parathyroid Drugs; Agents affecting bone mineralization
- Pancreatic Hormones and the Treatment of Diabetes Mellitus.

**CHEMOTHERAPY OF INFECTIOUS AND NEOPLASTIC DISEASES**

- Treatment of Infections; Antibacterial Drugs
- Treatment of Infections; Antiviral Drugs

- Treatment of Infections; Antifungal and Antiparasitic drugs
- Cancer Chemotherapy
- Immunomodulating Agents

### **DRUGS USED IN CURRENT PHYSICAL THERAPY PRACTICE**

- Drugs administered by Iontophoresis and Phonophoresis
- Potential Interactions between Physical Agents and Therapeutic drugs.

### **RECOMMENDED BOOK**

1. Pharmacology in Rehabilitation (5<sup>th</sup> Edition-2015) By Charles D. Ciccone.
2. Pharmacology, Richard A. Harvey, 3<sup>rd</sup> Edition, Lippincott's.
3. A Textbook of Clinical Pharmacology and Therapeutics, 5<sup>th</sup> Edition by James Ritter 2012

## **PHYSICAL AGENTS & ELECTROTHERAPY-II CREDIT HOURS 3(2-1)**

### **COURSE DESCRIPTION**

This course covers the basic principle of electrotherapy modalities used in physical therapy, including thermal, mechanical, physical agents and electromagnetic tools. Also help to understand the Indication, Contraindication and Methods of application in physical therapy.

### **Course Outcomes:**

At the end of the semester students should be able to

1. Explain the physiological basis of different modalities
2. Discuss the selection of appropriate modalities in different condition
3. Demonstrate the application of thermal, mechanical and electromagnetic tools in different conditions

### **Course Learning Objectives:**

1. Understand electrotherapy, the difference between electric currents, electromagnetic radiation, mechanical waves and other physical agents used in physical therapy
2. Define and explains all types of physical agents for therapeutic purposes
3. Describe and explains the physiological effects of all physical agents used in therapy
4. Understands in detail the therapeutic uses of different physical agents and their indications and contraindications
5. Understand and demonstrate the method of application of all physical agents skillfully on models
6. Clearly understand the adverse effects of different physical agents and its remedy for patients
7. Understands and demonstrate the correct selection of physical agents for different conditions
8. Understand and demonstrate the correct selection of physical agents for different conditions and practically demonstrate the application of therapeutic currents in a lab
9. Improve skills to demonstrate the safe use of physical agents on patients.

## **COURSE CONTENTS**

### **MEDIUM FREQUENCY CURRENT**

- Interferential Current
- Introduction, physical principles, electro-physiological effects
- Clinical applications, methods of application
- Treatment consideration & contraindications.

### **PHYSICS OF HEAT AND RADIATION**

- Definition of heat and temperature
- Physical effects
- Transmission of heat
- Radiant energy electromagnetic spectrum its production & properties
- Laws governing radiation.

### **INFRA-RED RAYS**

- Definition
- Production, luminous & non-luminous generators
- Physiological effects
- Therapeutic effects
- Uses
- Techniques of application
- Dangers and contraindications.

### **ULTRAVIOLET RAYS**

- Production, U.V. rays
- Mercury Vapour Lamp: Air cooled mercury vapour lamp & Kromayer lamp
- Fluorescent Tubes
- Penetration of rays into the skin
- Physiological effects (local & general)
- Therapeutic effects
- Sensitizers
- Assessment of doses
- Test dose
- Techniques of local and general radiation with special techniques of treatment of wounds
- Techniques with compression
- Dangers & precautions
- Contraindications.

### **HELIO THERAPY**

- Introduction
- Effects

- Uses
- Dangers and contraindications.

### **ULTRASONIC THERAPY**

- Introduction
- Production
- Physiological & therapeutic effects
- Uses, dangers, precautions & contraindications
- Techniques and application of treatment.

### **CRYOTHERAPY**

- Definition
- Methods
- Physiological & therapeutic effects
- Dangers, indications and precautions.

### **HYDROTHERAPY**

- Physiological principles of hydrotherapy
- Application of heat & cold
- Outline of methods of applying moist heat
- Medium used, contrast bath, paraffin baths, whirlpool baths, techniques, effects, uses, dangers, contraindications of each
- The use of water as medium of each, the use of water as a medium of movement pool therapy
- Immersion baths, full, plain and medicated, partial baths, packs, general local methods of application
- Hot air, vapors, the care of patients in hydrological department
- Detailed description of indication of hydrotherapy.

### **TRACTION**

- Effects of spinal traction
- Clinical indications for the use of spinal traction
- Contraindications and precautions for spinal traction
- Adverse effects of spinal traction
- Application technique.

### **COMPRESSION**

- Effects of External Compressions
- Clinical indications for the Use of External Compression
- Contraindications and Precautions of External Compression
- Contraindications for the Use of Intermittent or Sequential Compression Pumps
- Precautions for the Use of Intermittent or Sequential Compression Pumps
- Adverse Effects of External Compression



- Application Techniques.

### **LASER THERAPY**

- Definition
- Properties of laser
- Production of Lasers
- Types of Lasers
- Techniques of application
- Dosage parameters
- Interaction of laser with body tissues
- Physiological and therapeutic effects of lasers
- Dangers and contraindications
- Methods of Treatment.

### **BIOFEED BACK**

- Introduction
- Indications
- Contra-Indications
- Types of Biofeedback
- Advantages
- Disadvantages

### **SHOCKWAVE THERAPY**

- Physiology
- Indications
- Method of Application
- Contra-Indications

### **WAX THERAPY**

- Characteristics of Paraffin Wax
- Care of Apparatus
- Physiological Effects
- Indications
- Contra-Indications
- Advantages
- Disadvantages
- Method of Application

### **MEGNATIC THERAPY**

- Indications
- Contra-Indications
- Method of Application

## **LAB WORK**

- The practical training will be practiced in physiotherapy treatment ward under the supervision of qualified physiotherapists.
- Practical application of Interferential therapy
- Practical application of Infra-red rays
- Practical application of ultrasound including Phonophoresis
- Supervised application of Ultraviolet rays including determination of test dosage
- Practical application of Cold packs
- Supervised application of Wax therapy
- Practical application of Infra-red Rays
- Practical application of Mechanical traction
- Supervised application of Hot packs, Electric Heating pads
- Paraffin Wax bath application
- Practical application of SWD
- Practical application of LASER
- Supervised application of Shock wave therapy
- Practical application of Magnetic therapy
- Demonstration of techniques during practical classes, later on techniques practiced by students on patients attending the department under supervision of trained physiotherapists.

## **Note**

The students are expected to make a record of his/her achievements in the log book. The log book is a collection of evidence that learning has taken place. It is a reflective record of achievements. The log book shall also contain a record of the procedures which student would have performed/observed.

## **RECOMMENDED BOOKS**

1. Clayton's Electrotherapy and Actinotherapy, 10<sup>th</sup> edition by PM Scott.
2. Electrotherapy: Evidence based Practice, 11<sup>th</sup> edition by Shelia Kitchen.
3. Michelle H Cameron's Physical Agent in Rehabilitation: From research to Practice.
4. Electrotherapy and Electrodiagnosis by S. Lient.
5. Applications of Shortwave Diathermy by P. M. Scott.
6. Practical Electrotherapy by Savage.
7. Textbook of Electrotherapy & Practical application by Jagmohan Singh  
2<sup>nd</sup> Edition

## **BIostatistics-II (University Optional) Credit Hours 3(3-0)**

### **COURSE DESCRIPTION**

The course is designed to provide the students with the necessary concepts of statistics to enable them to realize a research project in the field of Physiotherapy. It involves selection of appropriate statistical techniques to address questions of medical relevance; select and apply appropriate statistical techniques for managing common types of medical data; use various software packages for statistical analysis and data management; interpret the results of statistical analyses and critically evaluate the use of statistics in the medical literature; communicate effectively with statisticians and the wider medical community, in writing and orally through presentation of results of statistical analyses; explore current and anticipated developments in medical statistics. It is designed to teach entry-level physical therapy students the fundamentals of reading and understanding research methods, design, and statistics.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Demonstrate inferential statistics techniques through hypothesis testing as described in curriculum.

### **Course Learning Objectives:**

1. Demonstrate the basics of hypothesis testing as defined in course planner
2. Demonstrate hypothesis testing via z and t test
3. Apply ANOVA testing and two samples hypothesis testing
4. Perform chi square testing of hypothesis
5. Perform correlation and regression

### **COURSE CONTENTS**

#### **HYPOTHESIS TESTING**

- Introduction, Statistical problem, null and alternative hypothesis, Type-I and Type-II errors, level of significance, Test statistics, acceptance and rejection regions, general procedure for testing of hypothesis. Exercises.

#### **TESTING OF HYPOTHESIS- SINGLE POPULATION:**

- Introduction, testing of hypothesis and confidence interval about the population mean and proportion for small and large samples, Exercises.

#### **TESTING OF HYPOTHESES-TWO OR MORE POPULATIONS:**

- Introduction, Testing of hypothesis and confidence intervals about the difference of population means and proportions for small and large samples, Analysis of Variance and ANOVA Table. Exercises.

#### **TESTING OF HYPOTHESIS-INDEPENDENCE OF ATTRIBUTES**

Introduction, Contingency Tables, Testing of hypothesis about the Independence of

attributes. Exercises.

### **REGRESSION AND CORRELATION:**

- Introduction, cause and effect relationships, examples, simple linear regression, estimation of parameters and their interpretation.  $r$  and  $R^2$ . Correlation. Coefficient of linear correlation, its estimation and interpretation. Multiple regression and interpretation of its parameters. Examples,

### **RECOMMENDED TEXTBOOKS**

- Walpole, R. E. 1982. —Introduction to Statistics", 3<sup>rd</sup> Ed., Macmillan Publishing Co., Inc. New York. Muhammad, F. 2005.
- Statistical Methods and Data Analysis", KitabMarkaz, Bhawana Bazar Faisalabad.

## **COMMUNITY BASED MEDICINE & REHABILITATION**

### **CREDIT HOIURS 3(3-0)**

#### **COURSE DESCRIPTION**

This course is designed for the Physical Therapy students in order to develop strong background knowledge regarding the community health, wellbeing and community based rehabilitation. It also gives knowledge about the issues of community health, policies and procedures for their effective rehabilitation management. It provide awareness about the problems faced by people in community at all levels and effective strategies to solve these issues

#### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Develop a strong background knowledge regarding community health for physical therapy students
3. Awareness about the problems faced by people in the community at all levels and effective strategies to solve these issues

#### **Course Learning Objectives:**

1. Understand impact of environmental, biological, social and behavioral risk factors on health and disease through the epidemiologic methods
2. Understand agent, host and environmental factors determining health and disease
3. Understand complete nutritional assessment of individual using clinical, Anthropometric and diet survey tools
4. Understand the community health, diagnosis and to take remedial measure for improving community health
5. Understand various types of disabilities existing in special children.

#### **COURSE CONTENTS**

##### **COMMUNITY BASED MEDICINE**

##### **INTRODUCTION**

- History of Community medicine & rehabilitation
- Definition, concept of Health & illness of diseases
- Natural History of diseases, levels & prevention.

##### **ENVIRONMENTAL SANITATION & MEDICAL ENTOMOLOGY**

- water
- waste disposal
- Environmental problems & pollution.

##### **GENETICS**

- Prevention of genetic diseases
- Genetic counseling.

## **GENERAL EPIDEMIOLOGY**

### **DESCRIPTIVE EPIDEMIOLOGY**

- Time
- Place
- Person.

### **ANALYTICAL EPIDEMIOLOGY**

- Case control
- Cohort studies.

### **EXPERIMENTAL EPIDEMIOLOGY RANDOMIZED CONTROL TRIAL**

### **SYSTEMIC EPIDEMIOLOGY**

- Vector borne diseases
- Water borne diseases
- Air borne diseases
- Contact diseases
- Diseases of major public health and its importance along with national health programs wherever Applicable

### **NON-COMMUNICABLE DISEASES**

- Diabetes
- Hypertension
- Heart diseases
- Blindness
- Accidents
- Geriatric problems.

### **OCCUPATIONAL HEALTH PROBLEMS**

- M.C.H. and family welfare Programmes
- Health care delivery in the community
- National Health Policy
- National Health programmes including
- Rehabilitation, Evaluation of Health
- Programme, Health Planning Organization.

### **STRUCTURE OF HEALTH CARE SYSTEM IN THE COUNTRY**

- P. H. C. district level
- State level and central level.
- P. H. C. Organization and Function
- Role of Non-Governmental Organization.

### **HEALTH EDUCATION**

- Principles of Health Promotion
- Methods, approaches and media for
- I. E. C (Information, Education & Communication)
- Medical and Health/Information system

- Mental Health
- Nutrition.

## **COMMUNITY BASED REHABILITATION HEALTH IN THE COMMUNITY**

- Handicap and the community
- Nutrition and mal nutrition
- Breast feeding
- Immunization
- Oral rehydration.

## **NORMAL BODY FUNCTION**

- Normal development
- Growth and weight of children.

## **CONDITIONS AND TREATMENTS**

- Cerebral palsy in children
- Down syndrome
- Mental handicap
- Hydrocephalus
- Spin bifida
- Poliomyelitis
- Blindness
- Deafness
- Strokes
- Spinal cord injuries
- Amputation.

## **MANAGEMENT OF PATIENTS**

- Assessment and recoding
- Fits
- Contractures
- Pressure sores
- Urine and bowel management
- Chest infection
- Feeding children with cerebral palsy
- Toy making workshop
- Welfare assistance.

## **RECOMMENDED BOOKS**

1. Textbooks of Community Medicine, by Prof. H. A. Siddique (2<sup>nd</sup> Edition).
2. Parks text book of preventive & social medicine –K Park.
3. *Community based rehabilitation worker manual, marion loveday, global health publication*

4. *Introduction to Special Education* By: Allen and Beacon,(1992), A Simon &SuperterComp.Needham Heights
5. *Exceptional Children and Adults*, Patton, J.R. (1991); Boston Scott Foresmen and Co.
6. *Exceptional Children in Focus* by: Patton J.R. (1991); New York, Macmillan pub. Co



**SUPERVISED CLINICAL PRACTICE-II****CREDIT HOURS 3(0-3)****SYSTEMS REVIEW**

<b>SEMESTER</b>	<b>SUPERVISION</b>	<b>FOCUS</b>	<b>WARDS</b>	<b>COMPETENCIES</b>
6	SUPERVISED BY TRAINED PT	SYSTEMS REVIEW	ALL WARDS	LISTED BELOW

**COURSE DESCRIPTION**

During this supervised clinical practice, students are responsible for learning the skills of systems review and validate the need for physical therapy services. Students learn to objectively review each system under the supervision of trained physical therapists. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of patients (surgical, non-surgical, pediatric, geriatric, etc.) Student is required to keep a performance record of all listed competencies and successfully perform on real patients during the final evaluation of the course.

1. At the end of the semester students should be able to
2. Learn the art of history taking.
3. Learn their skills under supervision of trained physical therapists.
4. Learn how to interact with patients.
5. Learn the skills of systems review and validate the need for physical therapy services
6. Familiarize themselves with performance of these skills in all settings (inpatient and outpatient)

**COURSE LEARNING OBJECTIVES:**

1. Understand general history taking skills specific to systems of body (musculoskeletal, Integumentary, cardiovascular, pulmonary, and neurological.)
2. Understand SOAP method to learn history filing
3. Perform the review of systems to determine the need for referral or for physical therapy services
4. Keep a performance record of all listed competencies in their Clinical Logbook

## **CLINICAL COMPETENCIES**

- Perform review of systems to determine the need for referral or for physical therapy services.
- Systems review screening includes the following.

### **GENERAL HEALTH CONDITION (GHC)**

- Fatigue
- Malaise
- Fever/chills/sweats
- Nausea/vomiting
- Dizziness/lightheadedness
- Unexplained weight change
- Numbness/Paresthesia
- Weakness
- Mentation/cognition.

### **CARDIOVASCULAR SYSTEM (CVS)**

- Dyspnea
- Orthopnea
- Palpitations
- Pain/sweats
- Syncope
- Peripheral edema
- Cough.

### **PULMONARY SYSTEM (PS)**

- Dyspnea
- Onset of cough
- Change in cough
- Sputum
- Hemoptysis
- Clubbing of nails
- Stridor
- Wheezing.

### **GASTROINTESTINAL SYSTEM (GIS)**

- Difficulty with swallowing
- Heartburn, indigestion
- Change in appetite
- Change in bowel function.

### **URINARY SYSTEM (US)**

- Frequency
- Urgency

- Incontinence.

### **GENITAL REPRODUCTIVE SYSTEM (GRS) MALE**

- Describe any sexual dysfunction, difficulties, or concerns.

### **FEMALE**

- Describe any sexual or menstrual dysfunction, difficulties, or problems.

### **RECOGNITION OF RED AND YELLOW FLAGS**

- Initiate referral when positive signs and symptoms identified in the review of systems are beyond the specific skills or expertise of the physical therapist or beyond the scope of physical therapist practice
- Consult additional resources, as needed, including other physical therapists, evidence-based literature, other health care professionals, and community resources
- Screen for physical, sexual, and psychological abuse.

### **CARDIOVASCULAR AND PULMONARY SYSTEMS**

- Conduct a systems review for screening of the cardiovascular and pulmonary system (heart rate and rhythm, respiratory rate, blood pressure, edema)
- Read a single lead EKG.

### **INTEGUMENTARY SYSTEM**

- Conduct systems review for screening of the integumentary system, the assessment of pliability (texture), presence of scar formation, skin color, and skin integrity.

### **MUSCULOSKELETAL SYSTEM**

- Conduct a systems review for screening of musculoskeletal system, the assessment of gross symmetry, gross range of motion, gross strength, height and weight.

### **NEUROLOGICAL SYSTEM**

- Conduct a systems review for screening of the neuromuscular system, a general assessment of gross coordinated movement (balance, gait, locomotion, transfers, and transitions) and motor function (motor control and motor learning).
- Documentation of all listed competencies in SOAP notes format

### **Note**

It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical logbook duly checked and signed by clinical supervisor on weekly basis and head of institute at completion.

## SEVENTH SEMESTER

Sr.No.	Course Title	Credit Hours
<b>FOURTH PROFESSIONAL YEAR</b>		
01	MEDICINE I	3(3-0)
02	SURGERY I	3(3-0)
03	RADIOLOGY & DIAGNOSTIC IMAGING (Theory) RADIOLOGY & DIAGNOSTIC IMAGING (Practical)	3(2-1)
04	MUSCULOSKELETAL PHYSICAL THERAPY (Theory) MUSCULOSKELETAL PHYSICAL THERAPY (Practical)	3(2-1)
05	EVIDENCE BASED PRACTICE (Theory) EVIDENCE BASED PRACTICE (Practical)	3(2-1)
06	SUPERVISED CLINICAL PRACTICE III (Practical)	3(0-3)
07	SEERAH- I	NON CH 1 HOUR/WEEK
<b>Total Credit Hours in Semester-7</b>		<b>18</b>

## **MEDICINE-I**

## **CREDIT HOURS 3(3-0)**

### **COURSE DESCRIPTION**

- This course intends to familiarize students with medical terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores systemic diseases, focusing on epidemiology, pathology, histology, etiology, as well as primary and secondary clinical characteristics and their management.

#### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Describe medical terminologies, abbreviations, epidemiology, etiology, primary and secondary clinical characteristics of cardiovascular, rheumatological and bone, and respiratory diseases
3. Briefly explain an overview of medical management of listed diseases/disorders

#### **COURSE LEARNING OBJECTIVES:**

1. Discuss the pathophysiology, clinical manifestations and management of acute coronary syndrome and myocardial infarction
2. Discuss the pathophysiology, clinical manifestations and management of different types of heart failure
3. Diagnose the of normal ECG, arrhythmias and MI
4. Discuss the approach to a patient with primary and secondary hypertension with its investigations and management
5. Discuss Valvular Heart Diseases and its management
6. Describe the usual presentations of rheumatic fever and infective endocarditis
7. Describe in detail the pathogenesis, clinical features, evaluation and treatment plan for asthma
8. Discuss in detail the pathogenesis, clinical features, evaluation and treatment plan for COPD
9. Define TYPE 1 and TYPE 2 respiratory failure and understand the causes
10. Assess the benefits and hazards of long-term oxygen therapy
11. Differentiate between community acquired and hospital acquired pneumonia, assessment of severity and its management
12. Discuss the clinical manifestations, evaluation and investigation of pulmonary thromboembolism

13. Discuss the pathogenesis, etiology, clinical picture and management of pleural effusion and pneumothorax
14. Describe in detail the etiology, pathogenesis, clinical features, diagnostic tests, and treatment of tuberculosis
15. Differentiate inflammatory arthritis from osteoarthritis and management
16. Diagnose the clinical features and extra articular manifestations of rheumatoid arthritis
17. Describe the presentations of seronegative arthritis and ankylosing spondylitis, reactive and psoriatic arthritis
18. Discuss the clinical features, diagnostic criteria of Systemic Lupus Erythematosus and its management
19. Describe the rationale for prescribing disease modifying drugs and approach to modern therapy in rheumatoid arthritis
20. Discuss the diagnosis of systemic sclerosis and CREST in their similarities and differences
21. Discuss the clinical features and management of Sjogren's syndrome
22. Identify the risk factors for osteoporosis and how to prevent and manage it.

## **COURSE CONTENTS**

### **CARDIOVASCULAR DISEASES**

#### **CARDIAC DISEASES**

- Chest pain
- Dyspnoea
- Palpitation
- Peripheral edema
- Syncope
- Cardiac failure
- Acute pulmonary edema
- Cardiogenic shock
- Systemic hypertension
- Ischemic heart disease
- Angina pectoris
- Unstable angina
- Myocardial infarction
- Rheumatic fever
- Valvular heart diseases
- Congenital heart diseases

- Ventricular septic defect
- Atrial septal defect
- pulmonary heart disease
- Pericardial disease
- Pulmonary hypertension
- Cardiac arrhythmias and heart in pregnancy.

### **VASCULAR DISEASES**

- Arteriosclerosis
- Acute & Chronic ischemia of leg
- Aortic aneurysm
- Buerger\_s disease
- Raynaud\_s disease
- Varicose veins
- Venous thrombosis.

### **RHEUMATOLOGY AND BONE DISEASES: ARTHRITIS**

- Osteoarthritis
- Rheumatoid arthritis
- Connective tissue diseases
- Arthritis in elderly
- Arthritis in children,
- Seronegative spondyloarthropathies
- Crystals deposition disease
- Arthritis associated with other diseases.

### **BACK PAIN**

- Back Pain due to serious disease
- Inflammatory Back Pain
- Disc disease
- Mechanical problems
- Soft tissues problems
- Psychogenic Back Pain
- Nonspecific Back Pain
- Neck pain.

### **SOFT TISSUE RHEUMATISM: BONE DISEASES**

- Paget\_s disease
- Infections of bones
- Neoplastic disease
- Skeletal dysplasia
- Other hereditary diseases.

## **RESPIRATORY DISEASES**

### **DISEASES OF UPPER RESPIRATORY TRACT**

- Common cold
- Sinusitis
- Rhinitis
- Pharyngitis
- Acute laryngo-tracheobronchitis
- Influenza
- Inhalation of the foreign bodies.

### **DISEASE OF LOWER RESPIRATORY TRACT**

- Acute & chronic Bronchitis
- Bronchiectasis
- Cystic fibrosis
- Asthma
- Emphysema
- Pneumonias
- Tuberculosis
- Pulmonary fibrosis
- Radiation damage
- Common tumours of the lungs
- Respiratory failure
- Adult distress respiratory syndrome
- Disorders of chest wall and pleura
- Chest trauma
- Deformities of rib cage
- Dry pleurisy
- Pleural effusion
- Empyema
- Pneumothorax.

### **RECOMMENDED BOOKS**

1. Practice of medicine by: Davidson.
2. Clinical medicine by: Parveen j Kumar & Michael Clark.
3. Short text book of medicine by: M. Inam Danish.
4. Hutchison's clinical methods by: Michael swash. 21<sup>st</sup> edition.
5. Bed side techniques.



**COURSE DESCRIPTION**

This course intends to familiarize the students with principles of orthopaedic surgery along with detail description of surgical terminologies and abbreviations for efficient and effective chart reviewing and documentation. It also explores various orthopaedic conditions needing surgical attention, focusing on epidemiology, pathology, as well as primary and secondary clinical characteristics and their surgical management.

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Describe in detail surgical terminologies, abbreviations, etiology, primary and secondary clinical characteristics, classifications, indications, and complications for surgeries listed orthopedic conditions
3. Briefly explain an overview of surgical management of the listed conditions

**COURSE LEARNING OBJECTIVES:**

1. Demonstrate management and classification of all bones and joints of the body
2. Describe classification of the fractures and its management
3. Demonstrate management of complications of fractures
4. Demonstrate principles of general description & management of traumatic dislocation/subluxation of all joints
5. Introduction of anatomy & physiology of general description and management of injuries of soft tissues
6. Detailed description of physiotherapy management of individual tissue injuries around major joints of the body
7. Understand degenerative and Inflammatory Conditions, general orthopedic disorders, muscular dystrophies, and neuropathies
8. Define classification and management of Tumors
9. Understand congenital and acquired anomalies of the body
10. Define principles of medical and surgical management of the deformities of the joints
11. Differentiate deformities of upper limb, lower limb and spine.

## **COURSE CONTENTS**

### **ORTHOPEDIC SURGERY FRACTURES**

- Definition
- Classification
- Causes
- Clinical features
- Healing of fractures
- Complications
- Principles of general management of
- Fracture of the Upper Extremity
- Fracture of the Lower Extremity
- Fracture of the vertebral column, thorax and pelvis
- Basic and advanced trauma life support.

### **DISLOCATIONS & SUBLUXATIONS**

- Definition
- Traumatic dislocation
- General description
- Principles of general description & management of traumatic dislocation/subluxation of;
  - Shoulder joint
  - Acromioclavicular joint
  - Elbow joint
  - Hip joint
  - Knee joint.

### **SOFT TISSUE INJURIES**

- Introduction
- Anatomy & physiology general description and management of injuries of:
- Ligaments
- Tendons
- Muscles
- Fascia
- Bursae
- Detailed description of physiotherapy management of individual tissue injuries around:
- Shoulder region
- Elbow region
- Wrist and hand region
- Knee region
- Ankle region

- Muscles and tendons injuries of upper and lower limb
- Cervico-lumber injuries
- Whiplash of the cervical spine
- Crush injuries
- Spinal pain
- Degenerative and Inflammatory Conditions:
- Osteo-orthosis/Arthritis
- Spondylosis
- Spondylolysis
- Pyogenic arthritis
- Rheumatoid arthritis
- Juvenile arthritis
- Tuberculosis arthritis
- Gouty arthritis
- Haemophilic arthritis
- Neuropathic arthritis
- Ankylosing spondylitis
- Psoriatic arthritis.

#### **GENERAL ORTHOPEDIC DISORDERS**

- Carpel tunnel syndrome
- Compartment syndromes
- Muscular dystrophies
- Neuropathies
- Avascular necrosis of bone in adult and children
- Ischemic contracture
- Gangrene
- Rickets
- Osteoporosis and osteomalacia
- Shoulder pain
- Neck pain
- Knee pain
- Backache
- Painful conditions around elbow
- Detailed description of :
- Orthotics
- Prosthetics
- Splintage
- Traction
- POP

## **TUMOURS**

- Classification
- Principles of general management
- General description of benign and malignant tumors of musculoskeletal system

## **DEFORMITIES AND ANOMALIES**

- Definition
- Causes
- Classification
- Congenital and acquired deformities
- Physical and clinical and radiological features
- Complications
- Principles of medical and surgical management of the deformities
- General description of following deformities.

## **DEFORMITIES OF THE SPINE**

- Torticollis
- Scoliosis
- Kyphosis
- Lordosis
- Flat back.

## **DEFORMITIES OF THE LOWER LIMB**

- CDH
- Coxavera
- Coxavalga
- Anteversion
- Retroversion
- Genu valgum
- Genu varum
- Genu recurvatum
- CDK
- Talipes calcaneus equinus, varus & valgus
- Talipes calcaneovarus
- Talipes calcaneovalgus
- Talipes equinovarus
- Pes cavus
- Pes planus
- Hallux valgus & varum,
- Hallux rigidus and hammer toe.

## **DEFORMITIES OF SHOULDER AND UPPER LIMB**

- Sprengel's shoulder

- Cubitusvarum
- Cubitusvalgum
- Deputryn's contracture.

#### **RECOMMENDED BOOKS**

1. Short practice of surgery by Baily and Love\_s.
2. Text Book of Surgery by Ijaz Ahsan.
3. Outline of Fractures.

## **RADIOLOGY & DIAGNOSTIC IMAGING**

### **COURSE DESCRIPTION**

**CREDIT HOURS 3(2-1)**

This course covers the study of common diagnostic and therapeutic imaging tests. At the end of the course students will be aware of the indications and implications of commonly used diagnostic imaging tests as they pertain to patient's management.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Demonstrate awareness of the indications and implications of commonly used diagnostic imaging tests as they pertain to patient's management

### **Course Learning Objectives**

1. Describe in detail the examination and understanding of radiological imaging (X-Rays) of extremities, spine, and chest
2. Briefly explain an overview of radiological imaging including Mammography, Fluoroscopy, Computer Tomography, Magnetic Resonance Imaging, Ultrasound, Endoscopy, Nuclear Medicine and Interventional Radiology
3. Briefly explain indications to prescribe X-Rays, Mammography, MRI and Ultrasound.

## **COURSE CONTENTS**

### **FROM THE WATCHING OF SHADOWS**

- History
- A New Kind of Ray
- How a Medical Image Helps
- What Imaging Studies Reveal
- Radiography( x-rays )
- Fluoroscopy
- Computed Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- Ultrasound
- Endoscopy.

### **RADIOGRAPHY AND MAMMOGRAPHY**

- Equipment components
- Procedures for Radiography & Mammography
- Benefits versus Risks and Costs
- Indications and contraindications.

### **FLUOROSCOPY**

- Fluoroscopy

- Equipment used for fluoroscopy
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in Fluoroscopy
- Benefits versus Risks and Costs

### **COMPUTED TOMOGRAPHY (CT)**

- Computed Tomography
- Equipment used for Computed Tomography
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in Computed Tomography
- Benefits versus Risks and Costs

### **MAGNETIC RESONANCE IMAGING (MRI)**

- MRI
- Equipment used for MRI
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in MRI
- Benefits versus Risks and Costs
- Functional MRI.

### **ULTRASOUND**

- What is Ultrasound?
- Equipment used for Ultrasound
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in Ultrasound
- Benefits versus Risks and Costs.

### **ENDOSCOPY**

- Endoscopy
- Equipment used for Endoscopy
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in Endoscopy
- Benefits versus Risks and Costs.

### **NUCLEAR MEDICINE**

- Nuclear Medicine
- Equipment used for Nuclear Medicine
- Indications and Contra indications
- How it helps in diagnosis.
- Benefits versus Risks and Costs.

## **INTERVENTIONAL RADIOLOGY**

### **RECOMMENDED BOOKS**

1. Looking Within (How X-ray, CT, MRI, Ultrasound and Other Medical Images Created and How They Help Physicians Save Lives) by Anthony Brinton Wolbarst.
2. A–Z of Musculoskeletal and Trauma Radiology By: James R. D. Murray.
3. Essentials of Radiology by Fred. A. Mettler, 2<sup>nd</sup> edition.
4. Imaging in rehabilitation, By: Terry. R. Malone, Charles Hazle& Michael L. Grey. McGraw Hill Publishers.



## **MUSCULOSKELETAL PHYSICAL THERAPY      CREDIT HOURS 3(2-1)**

### **COURSE DESCRIPTION**

This course includes a study of applied anatomy and physiology of the musculoskeletal system and pathological changes of the system and function, including diagnostic tests and measurements. The use of evidence-based physical therapy intervention for musculoskeletal conditions will be emphasized. The course will focus on medical terminologies, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in the area of musculoskeletal physical therapy.

**Course Outcomes:** At the end of the semester students should be able to demonstrate the anatomy and physiology of the musculoskeletal system and pathological changes of the system and its functions, including diagnostic tests and measurements, relevant tests and measurements to determine impairment and the clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

### **Course Learning Objectives:**

1. Describe the principles and concepts of musculoskeletal evaluation and assessment
2. Demonstrate the principles of intervention, soft tissue injury, repair, and management.
3. Explain Arthritis–arthrosis, Fibromyalgia, Osteoporosis, Fractures–post-traumatic immobilization and the indications for surgical intervention.
4. Brief overview of common orthopedic surgeries and postoperative management
5. Design record of his/her achievements in the logbook. And all skills will be introduced through on-site demonstration and hands-on practice.

### **COURSE CONTENTS**

#### **MEDICAL TERMINOLOGY REGARDING MUSCULOSKELETAL SYSTEM PRINCIPLES AND CONCEPTS OF MUSCULOSKELETAL EVALUATION & ASSESSMENT**

- Patient history
- Observation
- Examination
- Principles, vital signs, examination of specific joints, functional assessment

- specific diagnostic test, reflexes and cutaneous distribution, joint play movements, palpation
- Principles, vital signs, examination of specific joints, functional assessment, specific diagnostic test, reflexes and cutaneous distribution, joint play movements, palpation
- Evaluation /Assessment of spine and peripheral joints
- Causes
- Effects of range limitation on functional activities
- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based musculoskeletal Physical Therapy Treatment protocols

## **PRINCIPLES OF INTERVENTION**

### **SOFT TISSUE INJURY, REPAIR, AND MANAGEMENT**

- Soft tissue lesions
- Management during the acute stage
- Management during the sub-acute
- Management during the chronic stage
- Cumulative trauma–chronic recurring pain

### **JOINT, CONNECTIVE TISSUE, AND BONE DISORDERS AND MANAGEMENT**

- Arthritis–arthrosis
- Fibromyalgia and myofascial pain syndrome
- Osteoporosis
- Fractures–post-traumatic immobilization.

### **SURGICAL INTERVENTIONS AND POSTOPERATIVE MANAGEMENT**

- Indications for surgical intervention
- Guidelines for preoperative and Postoperative management; considerations for preoperative management, considerations for postoperative management, potential postoperative complications
- Overview of common orthopedic surgeries and postoperative management; surgical approaches–open, arthroscopic, and arthroscopically assisted procedures, use of tissue grafts, repair, reattachment, reconstruction, stabilization, or transfer of soft tissues, release, lengthening, or decompression of Soft tissues.

## **EXERCISE INTERVENTIONS BY BODY REGION**

### **THE SPINE AND POSTURE: STRUCTURE, FUNCTION, POSTURAL IMPAIRMENTS & MANAGEMENT GUIDELINES POSTURE AND BIOMECHANICAL INFLUENCES**

- Alignment
- Stability.

### **IMPAIRED POSTURE**

- Etiology of pain
- Common faulty postures: characteristics and Impairments.

### **MANAGEMENT OF IMPAIRED POSTURE**

- General management guidelines
- Tension headache/cervical headache.

### **THE SPINE: IMPAIRMENTS, DIAGNOSES, & MANAGEMENT GUIDELINES**

- Review of the structure and function of the spine.

### **SPINAL PATHOLOGIES AND IMPAIRED SPINAL FUNCTION**

- Pathology of the intervertebral disk
- Pathomechanical relationships of the intervertebral disk and facet joints
- Pathology of the zygapophyseal (facet)
- Pathology of muscle and soft tissue injuries: strains, tears, and contusions
- Pathomechanics of spinal instability.

### **MANAGEMENT GUIDELINES BASED ON IMPAIRMENTS**

- Principles of management for the Spine
- Management guidelines–non-weight-bearing bias
- Management guidelines–extension bias
- Management guidelines–flexion bias
- Management guidelines–stabilization
- Management guidelines–mobilization
- Management guidelines–soft tissue injuries
- Management Guidelines–Temporomandibular Joint Dysfunction.

### **THE SPINE: EXERCISE INTERVENTIONS**

- Basic concepts of spinal management with exercise
- Fundamental interventions
- Patient education
- General exercise guidelines
- Kinesthetic awareness
- Elements of kinesthetic training–fundamental techniques
- Progression to active and habitual control of Posture
- Mobility/flexibility

- Cervical and upper thoracic
- Region–stretching techniques
- Mid and lower thoracic and lumbar
- Regions–stretching techniques
- Muscle performance: stabilization, muscle endurance, and strength training
- Stabilization training–fundamental techniques and Progressions
- Isometric and dynamic exercises
- Cardiopulmonary endurance
- Common aerobic exercises and effects on the spine
- Functional activities
- Early functional training–fundamental techniques
- Preparation for functional activities–basic exercise Techniques
- Body mechanics and environmental adaptations
- Intermediate to advanced exercise techniques for Functional training
- Education for prevention.

## **THE SHOULDER AND SHOULDER GIRDLE**

- Examination, evaluation and assessment of shoulder joint
- Referred pain and nerve injury
- Management of shoulder disorders and surgeries
- Joint Hypomobility: non-operative management
- Glenohumeral joint surgery and postoperative management
- Painful shoulder syndromes (rotator cuff disease, impingement syndromes, shoulder instabilities):
- Non-operative management
- Painful shoulder syndromes: surgery and postoperative management
- Shoulder dislocations: non-operative management
- Shoulder instabilities: surgery and post-operative management
- Exercise interventions for the shoulder
- Girdle Exercise Techniques During Acute And Early Subacute Stages of tissue healing
- Exercise techniques to increase flexibility and range of motion
- Exercises to develop and improve muscle performance and functional control.

## **THE ELBOW & FOREARM COMPLEX**

- Examination, evaluation and assessment of elbow and forearm complex
- Referred pain and nerve injury in the elbow region
- Management of elbow and forearm disorders and surgeries
- Joint Hypomobility: nonoperative management
- Joint surgery and postoperative management

- Myositis ossificans
- Overuse syndromes: repetitive trauma syndromes
- Exercise interventions for the elbow and Forearm
- Exercise techniques to increase flexibility and range of Motion
- Exercises to develop and improve muscle performance and functional.

### **THE WRIST & HAND**

- Examination, evaluation and assessment of wrist and hand
- Major nerves subject to pressure and trauma at the Wrist and hand
- Management of wrist and hand disorders And surgeries
- Joint Hypomobility: non-operative management
- Joint surgery and postoperative management
- Repetitive trauma syndromes/overuse
- Traumatic lesions in the wrist and hand
- Exercise interventions for the wrist and Hand
- Techniques for musculotendinous mobility
- Exercise techniques to increase flexibility and range Of motion
- Exercises to develop and improve muscle Performance, neuromuscular control, and coordination.

### **THE HIP**

- Examination, evaluation and assessment of hip joint
- The hip and gait
- Referred pain and nerve injury
- Management of hip disorders and surgeries
- Joint Hypomobility: non-operative management
- Joint surgery and post-operative management
- Fractures of the hip—surgical and postoperative management
- Painful hipsyndromes/overuse syndromes:non-operative management
- Exercise interventions for the hip region
- Exercise techniques to increase flexibility and range of motion
- Exercises to develop and improve muscle performance and functional control.

### **THE KNEE**

- Examination, evaluation and assessment of knee joint
- Referred pain and nerve injuries
- Management of knee disorders and surgeries
- Joint Hypomobility: non-operative management
- Joint surgery and post-operative management
- Patellofemoral dysfunction: non-operative management

- Patellofemoral and extensor mechanism dysfunction: Surgical and postoperative management
- Ligament injuries: non-operative management
- Ligament injuries: surgical and postoperative Management
- Meniscal tears: non-operative management
- Meniscal tears: surgical and postoperative management
- Exercise interventions for the knee
- Exercise techniques to increase flexibility and range of motion
- Exercises to develop and improve muscle performance and functional control.

## **THE ANKLE & FOOT**

- Examination, evaluation and assessment of ankle and foot joint
- Referred pain and nerve injury
- Management of foot and ankle disorders and surgeries
- Joint Hypomobility: non-operative management
- Joint surgery and post-operative management
- Overuse (repetitive trauma) syndromes: non-operative management
- Ligamentous injuries: non-operative management
- Traumatic soft tissue injuries: surgical and postoperative management
- Exercise interventions for the ankle and foot
- Exercise techniques to increase flexibility and range of motion
- Exercises to develop and improve muscle performance and functional control

## **LAB WORK**

- The practical training will be sought in physiotherapy treatment based settings. Keeping in view therapeutic principles, management of various pre and post-operative conditions will be practiced under supervision and later independently by the students, the practical work might include Therapeutic Management of conditions of spine, and extremities.
- Reflective clinical case studies
- Supervised and independent Practical application of therapeutic techniques on patients in outdoor and indoor physiotherapy treatment settings.
- **Note:** The students are expected to make a record of his/her achievements in the log book. The log book is a collection of evidence that learning has taken place. It is a reflective record of achievements. The log book shall also contain a record of the procedures which student would have performed/observed.

## RECOMMENDED BOOKS

1. Therapeutics Exercises and Technique, By: Carolyn Kisner& Lynn Allen Colby 4th 5th edition.
2. Therapeutics Exercises: Techniques for Intervention By: Willim D.Banddy.
3. Clinical decision making in therapeutic exercise By: Patricia e. Sullivan & prudence d. Markos, Appleton & Lange Norwalk, Connecticut.
4. Hertling, D, and Kessler RM. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods. 3<sup>rd</sup> ed. Philadelphia, PA: WB Saunders 1995.
5. Orthopaedic Physical Therapy By: Donatelli& Michael J. Wooden 4th Edition.
6. Physiotherapy in Orthopaedics, A problem-solving approach By: Atkinson, Coutts &Hassenkamp2<sup>nd</sup> Edition.
7. Clinical orthopaedic rehabilitation By S. Brent. Brotzman& Kevin. E. Wilk, 2<sup>nd</sup> edition, Mosby publishers.
8. Management of Common Musculoskeletal Disorder by: Hertling, D, and Kessler RM Physical Therapy Principles and Methods. 3<sup>rd</sup> ed. Philadelphia.PA: WB Sunders.
9. Orthopedic Physical Assessment. Magee, D.4<sup>th</sup> ed. Philadelphia PA: WB Sunders 1995.
10. Physical Rehabilitations Assessments and Treatmentll. By Susan B,O=Sullivan&Thomas J. Schmitz , 4<sup>th</sup> edition.
11. Tidy's Physiotherapy by Thomas A Skinner & Piercy.

## **EVIDENCE BASED PRACTICE COURSE DESCRIPTION**

**CREDIT HOURS 3 (2-1)**

This course introduces the concept of evidence-based practice in physical therapy including the formulation of answerable clinical questions, methods of obtaining peer-reviewed evidence to those clinical questions, and how to critically appraise evidence once located. Current journal articles, texts, and online resources will be used in the course to develop critical reading and writing skills.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Demonstrate the concept of evidence-based practice in physical therapy including the formulation of answerable clinical questions, methods of obtaining peer-reviewed evidence to those clinical questions, and how to critically appraise evidence once located.

### **Course Learning Objectives:**

1. Discuss in detail the concept of evidence-based practice in physical therapy
2. Demonstrate the latest skills needed for obtaining, evaluating, critiquing and applying the scientific literature pertaining to physical therapy practice.

## **EVIDENCE-BASED PHYSIOTHERAPY**

- An introduction about evidence-based Physiotherapy:
- High quality clinical research
- Patient preferences
- practice knowledge
- Additional factors
- Introduction to clinical decision making and process
- Importance of evidence-based Physiotherapy for patients, physiotherapists, profession and funders of physiotherapy services
- History of Evidence-Based Health Care
- Steps for practicing evidence-based Physiotherapy.

## **INFORMATIONAL NEEDS**

- Relevant clinical questions
- Refining your question
- Effects of intervention
- Experiences
- Prognosis
- Diagnosis.

## **CONSTITUTION OF EVIDENCE**

- Evidence about effects of interventions



- Different forms of evidence
- Different sources of evidence
- Hierarchy of evidence
- Research study design.

### **FINDING THE EVIDENCE**

- Search Strategies
- The World Wide Web
- Selecting search terms AND OR
- Finding Evidence of Effects of Interventions
- PEDro
- The Cochrane Library
- Finding Evidence of Prognosis and Diagnostic Tests
- Finding Evidence of Experiences
- CINAHL
- PubMed
- Getting full text
- Finding evidence of advances in clinical
- Practice (Browsing).

### **TRUST UPON EVIDENCE**

- A process for critical appraisal of evidence
- Critical appraisal of evidence about the Effects of intervention
- Randomized trials
- Systematic reviews of randomized trials
- Critical appraisal of evidence about experiences
- Critical appraisal of evidence about prognosis
- Individual studies of prognosis
- Systematic reviews of prognosis
- Critical Appraisal of Evidence about Diagnostic Tests
- Individual studies of diagnostic tests
- Systematic reviews of diagnostic tests.

### **CLINICAL GUIDELINES AS A RESOURCE FOR EVIDENCE-BASED PHYSIOTHERAPY**

- What are clinical guidelines?
- History of clinical guidelines and why they are important
- Where can I find clinical guidelines?
- How do I know if I can trust the recommendations in a clinical Guideline?
- Scope and purpose
- Stakeholder involvement
- Rigor of development
- Clarity and presentation

- Applicability
- Editorial independence
- What do the results of the critical appraisal mean for my practice?
- Legal Implications of Clinical Guidelines
- Clinical guidelines or reasonable care: which do the courts consider more important?
- Reflections on the Future of Guideline Development
- Who should develop clinical guidelines?
- Collaboration in guideline development
- Unprofessional or multiprofessional guideline development?

### **CRITICAL THINKING**

- The Benefit of Asking the Right Questions
- What Are the Issue and the Conclusion?
- What Are the Reasons?
- What Words or Phrases Are Ambiguous?
- What Are the Value Conflicts and Assumptions?
- What Are the Descriptive Assumptions?
- Are There Any Fallacies in the Reasoning?
- How Good Is the Evidence: Intuition, Personal Experience?
- How Good Is the Evidence: Personal Observation, Research?
- Studies, Case Examples, and Analogies
- Are There Rival Causes?
- Are the Statistics Deceptive?
- What Significant Information Is Omitted?
- What Reasonable Conclusions Are Possible?
- Practice and Review
- The Tone of Your Critical Thinking
- Strategies for Effective Critical Thinking.

### **LAB WORK**

- Identify the different sources of evidence
- Critically appraised topics (CAT)
- How to evaluate web page
- Ways of searching strategies for different databases
- Selection of search terminology
- Retrieving of articles from data bases

### **RECOMMENDED BOOKS:**

1. Practical Evidence based physiotherapy By, Rob Herbert, GroJamtdvedt, Judy Mead & KareBirger Hagen.
2. Asking the right question-A guide to critical thinking, 8<sup>th</sup> Edition By, M. Neil. Browne & Stuart M Keeley.

**SUPERVISED CLINICAL PRACTICE – III  
MUSCULOSKELETAL****CREDITS 3 (0-3)**

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
7	Supervised by Trained PT	Musculoskeletal Examination	All wards	As listed below

**COURSE DESCRIPTION**

- During this supervised clinical practice, students are responsible for successful execution of examination, evaluation, and interventions relating to musculoskeletal disorders. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, pediatric and geriatric).
- Students learn to objectively perform these skills under the supervision of trained physical therapists. Student is required to keep a performance record of all listed competencies and successfully perform on real patients during the final evaluation of the course.

**Course Learning Objectives:**

1. Understand musculoskeletal skills specific to body disorders
2. Perform tests of each musculoskeletal condition to determine the diagnosis and treatment plan
3. Learn to objectively perform these skills under the supervision of trained physical therapists
4. Performance record of all listed competencies in Clinical Logbook

**Clinical Competencies****EXAMINATION**

- Based on best available evidence select examination tests and measures that are appropriate for the patient/client.
- Perform posture tests and measures of postural alignment and positioning.\*
- Perform gait, locomotion and balance tests including quantitative and qualitative measures such as:
- Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment

- Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
- Gait and locomotion during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
- Bed mobility
- Transfers (level surfaces and floor)
- Wheelchair management
- Uneven surfaces
- Safety during gait, locomotion, and balance
- Perform gait assessment including step length, speed, characteristics of gait, and abnormal gait patterns.
- Characterize or quantify body mechanics during self-care, home management, work, community, tasks, or leisure activities.
- Characterize or quantify ergonomic performance during work (job/school/play)\*:
- Dexterity and coordination during work
- Safety in work environment
- Specific work conditions or activities
- Tools, devices, equipment, and workstations related to work actions, tasks, or activities
- Characterize or quantify environmental home and work (job/school/play) barriers:
- Current and potential barriers
- Physical space and environment
- Community access
- Observe self-care and home management (including ADL and IADL)
- Measure and characterize pain\* to include:
- Pain, soreness, and nociception
- Specific body parts
- Recognize and characterize signs and symptoms of inflammation.

## **PERFORM MUSCULOSKELETAL SYSTEM TESTS AND MEASURES INCLUDING:**

- Accessory movement tests
- Anthropometrics
- Limb length
- Limb girth
- Body composition

- Functional strength testing
- Joint integrity
- Joint mobility
- Ligament laxity tests
- Muscle length
- Muscle strength including manual muscle testing, dynamometry, one repetition max
- Palpation
- Range of motion including goniometric measurements.

### **PERFORM ORTHOTIC TESTS AND MEASURES INCLUDING**

- Components, alignment, fit, and ability to care for orthotic, protective, and supportive devices and equipment.
- Evaluate the need for orthotic, protective, and supportive devices used during functional activities.
- Remediation of impairments in body function and structure, activity limitations, and participation restrictions with use of orthotic, protective, and supportive device.
- Residual limb or adjacent segment, including edema, range of motion, skin integrity and strength.
- Safety during use of orthotic, protective, and supportive device.
- Perform prosthetic tests and measures including\*:
  - Alignment, fit, and ability to care for prosthetic device.
  - Prosthetic device use during functional activities.
  - Remediation of impairments in body function and structure, activity limitations, and participation restrictions, with use of prosthetic device.
  - Evaluation of residual limb or adjacent segment, including edema, range of motion, skin integrity, and strength.
  - Safety during use of the prosthetic device.
- Perform tests and measures for assistive and adaptive devices including\*:
  - Assistive or adaptive devices and equipment use during functional activities.
  - Components, alignment, fit, and ability to care for the assistive or adaptive devices and equipment.
  - Remediation of impairments in body function and structure, activity limitations, and participation restrictions with use of assistive or adaptive devices and equipment.
  - Safety during use of assistive or adaptive equipment.

### **EVALUATION**

- Clinical reasoning
- Clinical decision making

- Synthesize available data on a patient/client expressed in terms of the International Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation.
- Use available evidence in interpreting the examination findings.
- Verbalize possible alternatives when interpreting the examination findings.
- Cite the evidence (patient/client history, lab diagnostics, tests and measures and scientific literature) to support a clinical decision.

## **DIAGNOSIS**

- Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (practice patterns in the Guide)
- Identify and prioritize impairments in body functions and structures, and activity limitations and participation restrictions to determine specific body function and structure, and activities and participation towards which the intervention will be directed.

## **PROGNOSIS**

- Determine the predicted level of optimal functioning and the amount of time required to achieve that level.
- Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame including:
  - Age
  - Medication(s)
  - Socioeconomic status
  - Co-morbidities
  - Cognitive status
  - Nutrition
  - Social Support
  - Environment.

## **PLAN OF CARE**

- Goal setting
- Coordination of Care
- Progression of care
- Discharge
- Design a Plan of Care
- Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes.
- Consult patient/client and/or caregivers to develop a mutually agreed to plan of care.
- Identify patient/client goals and expectations.

- Identify indications for consultation with other professionals.
- Make referral to resources needed by the patient/client (assumes knowledge of referral sources).
- Select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care
- Identify precautions and contraindications
- provide evidence for patient-centered interventions that are identified and selected
- define the specificity of the intervention (time, intensity, duration, and frequency)
- Set realistic priorities that consider relative time duration in conjunction with family, caregivers, and other health care professionals.
- Establish criteria for discharge based on patient goals and current functioning and disability.
- Coordination of Care
- Identify who needs to collaborate in the plan of care.
- Identify additional patient/client needs that are beyond the scope of physical therapist practice, level of experience and expertise, and warrant referral.
- Refer and discuss coordination of care with other health care professionals.
- Articulate a specific rationale for a referral.
- Advocate for patient/client access to services.
- Progression of Care
- Identify outcome measures of progress relative to when to progress the patient further.
- Measure patient/client response to intervention.
- Monitor patient/client response to intervention.
- Modify elements of the plan of care and goals in response to changing patient/client status, as needed.
- Make on-going adjustments to interventions according to outcomes including environmental factors and personal factors and, medical therapeutic interventions.
- Make accurate decisions regarding intensity and frequency when adjusting interventions in the plan of care.
- Discharge Plan
- Re-examine patient/client if not meeting established criteria for discharge based on the plan of care.
- Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with reevaluation.

- Prepare needed resources for patient/client to ensure timely discharge, including follow-up care.
- Include patient/client and family/caregiver as a partner in discharge.
- Discontinue care when services are no longer indicated.
- When services are still needed, seek resources and/or consult with others to identify alternative resources that may be available.
- Determine the need for equipment and initiate requests to obtain.

## **INTERVENTIONS**

- Safety, Emergency Care, CPR and First Aid
- Standard Precautions
- Body Mechanics and
- Positioning
- Categories of Interventions
- Safety, Cardiopulmonary Resuscitation Emergency Care, First Aid
- Ensure patient safety and safe application of patient/client care.
- Perform first aid.
- Perform emergency procedures.
- Perform Cardiopulmonary Resuscitation (CPR).
- Precautions
- Demonstrate appropriate sequencing of events related to universal precautions.
- Use Universal Precautions.
- Determine equipment to be used and assemble all sterile and non-sterile materials.
- Use transmission-based precautions.
- Demonstrate aseptic techniques.
- Apply sterile procedures.
- Properly discard soiled items.

## **BODY MECHANICS AND POSITIONING**

- Apply proper body mechanics (utilize, teach, reinforce, and observe).
- Properly position, drape, and stabilize a patient/client when providing physical therapy.

## **INTERVENTIONS**

- Coordination, communication, and documentation may include:
- Addressing required functions:
- Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services.



- Discern the need to perform mandatory communication and reporting (eg, incident reports, patient advocacy and abuse reporting).
- Follow advance directives.
- Admission and discharge planning.
- Case management.
- Collaboration and coordination with agencies, including:
  - Home care agencies
  - Equipment suppliers
  - Schools
  - Transportation agencies
  - Payer groups
- Communication across settings, including:
  - Case conferences
  - Documentation
  - Education plans
- Cost-effective resource utilization.
- Data collection, analysis, and reporting of:
  - Outcome data
  - Peer review findings
  - Record reviews
- Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including:
  - Elements of examination, evaluation, diagnosis, prognosis, and Intervention
  - Changes in body structure and function, activities and participation.
  - Changes in interventions
  - Outcomes of intervention
  - Interdisciplinary teamwork:
    - Patient/client family meetings
    - Patient care rounds
    - Case conferences
  - Referrals to other professionals or resources.
  - Patient/client-related instruction may include:
    - Instruction, education, and training of patients/clients and caregivers regarding:
      - Current condition, health condition, impairments in body structure and function, and activity limitations, and participation restrictions)
      - Enhancement of performance
      - Plan of care:

- Risk factors for health condition, impairments in body structure and function, and activity limitations, and participation restrictions.
- Preferred interventions, alternative interventions, and alternative modes of delivery
- Expected outcomes
- Health, wellness, and fitness programs (management of risk factors)
- Transitions across settings.

### **THERAPEUTIC EXERCISE MAY INCLUDE PERFORMING**

- Body mechanics and postural stabilization:
- Body mechanics training
- Postural control training
- Postural stabilization activities
- Posture awareness training
- Flexibility exercises:
- Muscle lengthening
- Range of motion
- Stretching
- Gait and locomotion training:
- Developmental activities training
- Gait training
- Device training
- Perceptual training
- Basic wheelchair training
- Strength, power, and endurance training for head, neck, limb, and trunk
- Active assistive, active, and resistive exercises (including concentric, dynamic/isotonic, eccentric, isokinetic, isometric, and plyometric exercises)
- Aquatic programs
- Task-specific performance training
- Strength, power, and endurance training for pelvic floor:
- Active (Kegel)
- Strength, power, and endurance training for ventilatory muscles
- Active and resistive
- Manual therapy techniques may include:
- Passive range of motion
- Massage:
- Connective tissue massage
- Therapeutic massage
- Manual traction
- Mobilization/manipulation:

- Soft tissue (thrust and non-thrust)
- Spinal and peripheral joints (thrust and non-thrust)
- Functional training in self-care and home management may include:
- Functional training in work (job/school/play), community, and leisure integration or reintegration may include:
- Activities of daily living (ADL) training:
- Bed mobility and transfer training
- Age appropriate functional skills
- Barrier accommodations or modifications
- Device and equipment use and training:
- Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)
- Orthotic, protective, or supportive device or equipment training during self-care and home management
- Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)\*
- Functional training programs
- Simulated environments and tasks
- Task adaptation
- Injury prevention or reduction:
- Safety awareness training during self-care and home management\*
- Injury prevention education during self-care and home management
- Injury prevention or reduction with use of devices and equipment
- Prescription, application, and, as appropriate, fabrication of devices and equipment may include:
- Adaptive devices
- Hospital beds
- Raised toilet seats
- Seating systems – prefabricated
- Assistive devices
- Canes
- Crutches
- Long-handled reachers
- Static and dynamic splints – prefabricated
- Walkers
- Wheelchairs
- Orthotic devices:
- Prefabricated braces
- Prefabricated shoe inserts

- Prefabricated splints
- Prosthetic devices (lower-extremity)
- Protective devices:
- Braces
- Cushions
- Helmets
- Protective taping
- Supportive devices:
- Prefabricated compression garments
- Corsets
- Elastic wraps
- Neck collars
- Slings
- Supplemental oxygen - apply and adjust
- Supportive taping
- Electrotherapeutic modalities may include:
- Biofeedback
- Electrotherapeutic delivery of medications (eg, iontophoresis)
- Electrical stimulation:
- Electrical muscle stimulation (EMS)
- Functional electrical stimulation (FES)
- High voltage pulsed current (HVPC)
- Neuromuscular electrical stimulation (NMES)
- Transcutaneous electrical nerve stimulation (TENS)
- Physical agents and mechanical modalities may include: *Physical agents:*
- Cryotherapy:
- Cold packs
- Ice massage
- Vapocoolant spray
- Hydrotherapy:
- Contrast bath
- Pools
- Whirlpool tanks
- Sound agents:
- Phonophoresis
- Ultrasound
- Thermotherapy
- Dry heat
- Hot packs
- Paraffin baths

- Mechanical modalities: Compression therapies (prefabricated)
- Compression garments: Skill Category Description of Minimum Skills
- Vasopneumatic compression devices
- Taping
- Compression bandaging (excluding lymphedema)
- Gravity-assisted compression devices:
- Standing frame
- Tilt table
- Mechanical motion devices:
- Continuous passive motion (CPM)
- Traction devices
- Intermittent
- Positional
- Sustained
- Documentation of all listed competencies in SOAP notes format

**Note**

It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical log book duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

## EIGHTH SEMESTER

Sr.No.	Course Title	Credit Hours
01	NEUROLOGICAL PHYSICAL THERAPY (Theory) NEUROLOGICAL PHYSICAL THERAPY (Practical)	3(2-1)
02	SCIENTIFIC INQUIRY & RESEARCH METHODOLOGY (Theory) SCIENTIFIC INQUIRY & RESEARCH METHODOLOGY (Practical)	3(2-1)
03	EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY (Theory) EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY (Practical)	3(2-1)
04	SUPERVISED CLINICAL PRACTICE IV (Practical)	3(0-3)
05	SEERAH -II	NON CH 1 HOUR/WEEK
<b>Total Credit Hours in Semester-8</b>		<b>18</b>

## **MEDICINE-II**

**CREDIT HOURS 3 (3-0)**

### **COURSE DESCRIPTION**

This course intends to familiarize students with medical terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores systemic diseases, focusing on epidemiology, pathology, histology, etiology, as well as primary and secondary clinical characteristics and their management. Discusses and integrates subsequent medical and surgical management to formulate appropriate intervention indications, precautions and contraindications.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Discuss history and physical examination related to dermatology, diseases of the brain and the spinal cord, renal diseases, blood and other miscellaneous conditions mentioned in the course contents
3. Identify social and psychological components of patients' medical problems
4. Discuss disease process, indications and limitations of clinical sources such as laboratory and roentgen graphic studies, consults, family input and old records to request and interpret data pertinent to problem solving

### **Course Learning Objectives:**

1. Describe the different types and clinical manifestations of diabetes
2. Describe the management of common diabetic emergencies
3. Describe the complications and treatment of DM
4. Describe the etiology, pathogenesis, clinical features, diagnostic tests, and treatment of Nephritic syndrome
5. Discuss the etiology, pathogenesis, clinical features, diagnostic tests, and treatment of acute renal failure
6. Define urinary tract infections along with their evaluation and treatment
7. Discuss the etiology, pathogenesis, clinical features, diagnostic tests, and treatment of chronic renal failure
8. Describe the clinical features, diagnostic tests, and treatment of post streptococcal glomerulonephritis
9. Describe the various clinical presentations of intrinsic renal disease and their causes
10. Describe the etiology, pathogenesis, clinical features, diagnostic tests, and treatment of Nephrotic syndrome

11. Recognize the clinical features of eczema and psoriasis
12. Recognize fungal and viral infections of the skin and its management
13. Discuss the skin manifestation of systemic diseases
14. Recognize erythema nodosum and the conditions with which it is associated
15. Describe the characteristic features, differential diagnosis and management of cerebrovascular disease
16. Discuss different causes of headaches and how to investigate a patient with headache and its management
17. Describe the clinical features and management of disabling neurological conditions such as Parkinson's disease, multiple sclerosis and motor neuron disease
18. Discuss the approach to a patient with meningitis and encephalitis, its investigations and treatment
19. Discuss the clinical manifestations, classification, differential diagnosis and management of epilepsy
20. Describe the different types of hematological disorders
21. Describe the classification and causes of anemia and how to investigate and manage anemia
22. Differentiate between acute and chronic leukemia
23. Describe the different causes of thrombocytopenia and bleeding disorders and their management.

## **COURSE CONTENTS**

### **DERMATOLOGY**

- Acne vulgaris
- Psoriasis
- Boils
- Carbuncles
- Alopecia
- Mycosis fungoides
- Polymorphic light eruptions
- Vitiligo
- Pityriasis
- Hyperhidrosis

### **DISEASES OF BRAIN AND SPINAL CORD**



- Identify the common neurological symptoms including brain death, Sleep, Unconsciousness and Comma.
- Carry out general neurological examination
- Stroke, types of stroke, Parkinson's disease, Epilepsy, Multiple Sclerosis, Infective and Inflammatory diseases, Hydrocephalus, Headache, Migraine, Facial pain, Head injury, Motor neuron disease, Diseases of spinal cord, Diseases of Cranial nerves, Peripheral nerve lesions, Diseases of voluntary muscles and of neuromuscular junction
- Different types of Intracranial tumors

### **RENAL DISEASES**

- Describe Glomerulonephritis, Acute nephritic syndrome, Nephrotic syndrome, Urinary tract infection, Renal hypertension, Renal failure, Benign enlargement of prostate gland, Prostatic carcinoma.

### **DISEASES OF THE BLOOD**

- Describe Anaemia, Types of Anaemia, Bleeding and Coagulation, Haemophilia and Thrombosis

### **MISCELLANEOUS DISEASES**

- Describe Diabetes Mellitus and its complications, Diabetic Neuropathy, Diabetic foot and Steroid induced Myopathy.

### **RECOMMENDED BOOKS**

1. Practice of medicine by: Davidson.
2. Clinical medicine by: Parveen j Kumar & Michael Clark.
3. Short text book by medicine by: M. Inam Danish.
4. Hutchison's clinical methods by: Michael swash. 21st edition

## **SURGERY – II**

**CREDIT HOURS 3 (3-0)**

### **COURSE DESCRIPTION**

This course intends to familiarize students with principles of surgery along with familiarization with terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores various conditions needing surgical attention, focusing on epidemiology, pathology, as well as primary and secondary clinical characteristics and their surgical management

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Demonstrate the pre- and post-operative care of patients
3. Describe presentations of major surgical problems, establish correlations among clinical observation, surgical (operative) pathology, and the physiological alterations achieved through surgery
4. Differentiate the surgical health care delivery to both inpatients and outpatients in a variety of settings
5. Describe the surgical management of disease
6. Recognize the entire treatment cycle of the surgical patient from diagnosis to operative management and through recovery

### **Course Learning Objectives:**

1. Describe indications of general Surgery, wound healing and types of incisions
2. Describe indications of surgery of abdominal organs and recovery stages
3. Describe types of methods of anesthesia and pain management
4. Explain post operative complications and precautions
5. Define indications of cardiac surgery and special investigations
6. Explain different cardiac surgical procedures
7. Describe indications and complication of vascular surgery, arterial occlusion, Gangrene, amputation, and its types
8. Define indications and complications of Aneurysm, Burger's disease, Raynaud's disease and syndrome, Varicose veins, Superficial and deep venous thrombosis, Venous hemorrhage, Lymph edema, Lymph adenitis and lymphomas
9. Explain indications of cranial surgeries and management of traumatic brain injuries
10. Explain spinal cord injuries and its management
11. Explain tumors of spinal cord and dislocation of spinal cords

### **COURSE CONTENTS**

#### **GENERAL SURGERY**

- Describe the Indications for surgery, Types of incisions, Wounds, types of wounds, factors affecting wounds healing, care of wounds, Bandages and

dressing, Trauma and metabolic response to trauma

- Explain chest and abdominal trauma, Hemorrhage, hemostasis and blood transfusion.
- Classification of shock, Fluid and electrolyte balance, Classification of body fluid changes, Pre, intra and post-operative fluid therapy.
- precautions for Surgery in diabetic patients
- Classify Burns, Types and degrees of Burns in pediatric and adults,
- Classify Grafts, Types of Grafts, Identify post- grafting precautions,
- Different types of tumors and their classifications.
- Discuss Preoperative assessment & preparation, Post -operative treatment, complications and their management.
- Describe the Types of anaesthesia, Local anaesthetic agents and Regional anaesthesia (spinal and epidural), Intravenous anaesthetic agents, Muscle relaxants, Inhalational anaesthetic agents, Anaesthesia and associated diseases, Complications of anaesthesia, Perioperative management, Recovery from anaesthesia.
- Review Pain management and postoperative care.
- Identify Ulcers, sinuses and fistulas
- Describe operation performed on: oesophagus, stomach, intestine gall bladder, bile duct, spleen, pancreas, liver, abdominal wall, hernias, breast, kidneys, ureters, prostate, peritoneum, mesentery and retroperitoneal space
- Describe the Indications of Transplantation, Post- Operative Complications and precautions of Transplantation of liver and kidney.

### **THORACIC and PULMONARY SURGERY**

- Explain the Indications of pulmonary surgery, types of incision, types of operation, complications of pulmonary surgery, drains, and tubes.
- Describe pneumonectomy, lobectomy, thoracoplasty and Operations on pleura.
- Recognize the types of Chest injuries, Causes, management procedures.
- Describe the Diseases of chest wall and pleura, Diseases of bronchi
- Identify different types of Lung tumors and their classifications, Lung abscess, Hydatid disease of lung, pulmonary embolism, Mediastinal masses, Problems related to diaphragm.

### **CARDIAC SURGERY**

- Explain the Indications of Cardiac surgery, Special investigation procedures in cardiac surgery, Basic techniques in cardiac surgery, Types of incision, Types of operation, Complications of cardiac surgery, Lines, drains and tubes, Congenital heart disease Acquired heart diseases, Diseases of the pericardium
- Describe the Indications of Cardiac Transplantation, Post- Operative Complications and precautions of Transplantation.

## **VASCULAR SURGERY**

- Describe the Indications of Vascular surgery, Investigation in vascular disease types of operation, Complication of vascular surgery, arterial occlusion, Gangrene, amputation and its types, Aneurysm, Burgers disease, Raynaud's disease and syndrome, Varicose veins, Superficial and deep venous thrombosis, Venous hemorrhage, Lymph edema, Lymph adenitis and lymphomas.

## **NEUROSURGERY**

### **CRANIAL SURGERY**

- Describe the Indications of Cranial surgery, Special investigation in brain diseases and traumas, Types of operations and complications of cranial surgery
- Explain Traumatic brain injuries, Acute intracranial hematomas and Fractures of the skull
- Describe the Intra cranial abscess, intracranial tumors, intracranial aneurysm and hydrocephalus.

### **SURGERY OF VERTEBRAL COLUMN, SPINAL CORD AND PERIPHERAL NERVES**

- Describe Dislocation and management of dislocation of vertebral column, Tumors of vertebral column
- Explain Prolapse intervertebral disc, Disc protrusion, Spondylosis and spondylolisthesis.
- Classify Spinal cord injuries and syndromes.
- Assess the level, complete and incomplete spinal cord injuries and rehabilitation potential.
- Describe the Surgical, medical Management and post- operative care of Spinal cord injuries.
- Describe Tumors of spinal cord types of operations performed on nerves, Nerve injuries and their surgical management,
- Describe the lesions of cranial and spinal nerves and their management.

### **RECOMMENDED BOOKS**

- Short practice of surgery by Baily and Love\_s.
- Text Book of Surgery by Ijaz Ahsan.
- Outline of Fractures by davidhamblen, Hamish Simpsons.
- Outline of orthopedics. By davidhamblen, Hamish Simpsons.

**COURSE DESCRIPTION**

This course provides an in-depth exploration of the assessment and intervention procedures used with persons with various neurological pathologies. The focus of this course will be on neurological problems acquired in adulthood. Theories of motor control and motor learning will be studied and applied to assessment and treatment. Laboratories will be used to strengthen evaluation and intervention skills, especially the analysis of movement as well as planning, practicing, and modifying treatment. Clinical competence in the evaluation and treatment of persons with neurological impairments is to be developed. It will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Explain neurological problems acquired in adulthood
3. Demonstrate the assessment of patients with various neurological pathologies
4. Explain various intervention strategies and procedures to manage patients with various neurological pathologies
5. Describe motor control and neuro-developmental approaches of interventions
6. Discuss and demonstrate management to patients with various neurological pathologies

**Course Learning Objectives:**

1. Understand an in-depth exploration of the assessment and intervention procedures used with persons with various neurological pathologies
2. Understand theories of motor control and motor learning and their application for assessment and treatment
3. Laboratories will be used to strengthen evaluation and intervention skills
4. Understand the analysis of movement as well as planning, practicing, and modifying treatment
5. Clinical competence in the evaluation and treatment of persons with neurological impairments is to be developed
6. Understand medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions, and the impact of evolving

technology.

## **COURSE CONTENTS**

### **APPLIED ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM**

- Functional and applied anatomy of Brain, Spinal cord, CNS Support Structures, Neurons, Peripheral nervous system, autonomic Nervous System and Spinal Level Reflexes.

### **NEUROLOGICAL EXAMINATION**

- Perform assessment of patients with various neurological pathologies.
- Conduct & document clinical examination (History, System review, Test and measures, used in standardized assessment procedure
- Evaluate and Analyze clinical assessment procedures to construct a problem list, long term Goals, Short term goals, Treatment plan, Progression and discharge planning..

### **INTERVENTIONS**

- Different theories of Motor Control and Motor Learning, their limitations and clinical implications
- Neurodevelopmental (NDT) approaches and their clinical implications in the management of patients with neurological pathologies such as;
  - Roods approach
  - Bobath approach
  - Kabat, Knott, Voss (Proprioception neuro facilitation PNF Approach).
  - Burnstorm Approach.
- Contemporary approaches and their clinical implications in the management of patients with neurological pathologies such as;
  - Motor Control / Motor Learning Approach
  - Neural plasticity/ adoptability
  - Constraint induced movement therapy (CIMT)
  - Modified Constrained Induced Movement Therapy (mCIMT)
  - Task-Related Training Approach
  - Compensatory Training Approach
  - Normal Reach, Grasp and Manipulation.
- Construct treatment strategies to improve, strength, Balance, coordination, locomotion and gait, skill acquisition, postural control, mobility functions.
- Role of sensory system in improving motor control and sensory rehabilitation.

### **NEUROLOGICAL DYSFUNCTIONS**

- Assess and manage Stroke, types of stroke, problems associated with stroke

- Assess and manage traumatic Brain Injury (TBI), Types and severity of Problems associated with TBI
- Assess and manage Spinal Cord Injury (SCI), Complete and incomplete SCI, clinical Syndromes and problems associated with SCI.
- Assess and manage brain and spinal cord disorders such as;
- Multiple Sclerosis (MS)
- Cerebellar Disorders
- Parkinson's Disease (PD)
- Motor Neuron Disease (MND)
- PolyNeuropathies.
- Post polio Syndrome (PPS)
- Vestibular Disorders
- Cranial Nerves Disorders
- Myasthenia gravis
- Spinal muscular atrophy

### **PERIPHERAL NERVE DISORDERS AND MANAGEMENT**

- Peripheral nerve structure; nerve structure, nervous system mobility characteristics
- Common sites of injury to peripheral nerves, impaired nerve function and recovery process
- Neural tension disorders and their managements
- Neuromuscular disorders involving impaired nerve function such as:
  - Thoracic outlet syndrome
  - Carpal tunnel syndrome
  - Compression in tunnel of Guyon
  - Complex regional pain syndrome:
  - Reflex sympathetic Dystrophy and causalgia.

### **LAB WORK**

- In the laboratory sessions, neurological physiotherapy skills will be demonstrated and practiced. Various reflective case studies related to the neurological rehabilitation will be assigned to the students

### **RECOMMENDED BOOKS**

- Neurological Physiotherapy Bases of evidence for practice Treatment and management of patients described by specialist clinicians by Cecily Partridge
- Neurological Physiotherapy A problem-solving approach By Susan Edwards, second edition.
- Neurologic examination By Robert j. Schwartzman , first edition

## **RESEARCH METHODOLOGY & SCIENTIFIC INQUIRY**

**CREDIT HOURS 3(2-1)**

### **COURSE DESCRIPTION**

This course includes discussion on basic quantitative methods and designs, including concepts of reliability and validity, interpretation of inferential statistics related to research designs, co relational statistic & designs, interclass correlation coefficients, and critical appraisal of the literature.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Demonstrated the basics of research and its scientific methods to write basic proposals.

### **Course Learning Objectives:**

1. Demonstrate scientific research writing techniques with their methodology.
2. Perform a research topic selection process and research problem writing
3. Execute a literature review and search
4. Perform sampling and its methods
5. Write study designs
6. Write synopses and know about thesis writing techniques
7. Demonstrate basic data entry and analysis on SPSS.

### **COURSE CONTENTS**

#### **RESEARCH FUNDAMENTALS**

- Research in physical therapy and rehabilitation
- Role, importance, principles and application of Ethics in Rehabilitation research.
- Basic vs applied research.
- Research Problems / Questions, and Hypotheses, Research Paradigms, Research Validity and reliability

#### **SAMPLING**

- Discuss Selection of sample: sample & population, basic considerations in sampling, determination of sample size, elimination of sampling bias and types of sampling such as: Random sampling, stratified random sampling, cluster sampling and systematic sampling.

#### **RESEARCH DESIGN**

- Describe different research designs
- Differentiate between experimental & non-experimental, qualitative and quantitative and epidemiological research designs.
- Discuss different research methodologies used in experimental, and non-experimental, qualitative and qualitative and epidemiological research designs



## **RESEARCH PROJECT**

- Discuss various components of research synopsis and Thesis.
- Develop a Research Plan while taking into account, the ethical, legal and professional obligations

## **INSTRUMENTATION AND DATA COLLECTION**

- Discuss, objectivity and standardization, types of tests and scales, validity and reliability of an instrument, assessment of validity and reliability, development of tests/scale

## **DATA ANALYSIS & INTERPRETATION**

- Analyze data
- Describe types of measurement scales, descriptive statistics and inferential statistic.
- Perform data entry and Analysis using statistical package for Social Sciences (SPSS)

## **PREPARATION OF A RESEARCH REPORT**

- Use Formatting & styling, citation, references & bibliography
- Differentiate theses writing, dissertations & journal articles writing.

## **SCIENTIFIC INQUIRY**

- Describe scientific inquiry, Evidence based approach to scientific inquiry, Principles of scientific inquiry, the application of scientific inquiry to physical therapy.
- Access digital libraries and different research databases, Effective searching and reviewing literature material.
- Interpret Critical appraisal of published research in the areas of:
  - Examination and Evaluation
  - Diagnosis
  - Prognosis
  - Intervention
  - Harm
- Interpret Critical evaluation of Randomized Control Trial (RCT), Systemic review, Diagnosis and screening tests, Case reports
- Discuss how to conduct clinical research and hierarchy of evidences in clinical researches

## **LAB WORK**

- Literature review
- Selection of research topic & submission of research proposal

## **RECOMMENDED BOOKS**

1. *Essentials of clinical research* By Stephan P. Glasser.
2. *Rehabilitation Research (Principles and Applications)* 3<sup>rd</sup> Edition By Elizabeth Domholdt.

## **EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY CREDIT HOURS 2(2-0)**

### **COURSE DESCRIPTION**

- This course provides the student with all of the skills necessary to take appropriate action in an emergency in any practice setting. Basic life support, first aid and emergency. The course is designed to provide knowledge and skills in emergency techniques and in the application of appropriate action necessary to take care of the patient/client.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Demonstrate the skills necessary to take appropriate action in an emergency in any practice setting
3. Demonstrate the techniques of basic life support, first aid and emergency preparedness

### **Course Learning Objectives**

1. Illustrate the development and implementation of an emergency action plan
2. Compare a primary survey and a secondary survey
3. Identify the screening of cardiac warning signs and the preparation of cardiac emergencies
4. Identify emergent general medical conditions and environment related conditions
5. Describe basic emergency medical care related to orthopedic, abdominal, thoracic, and head injuries

### **COURSE CONTENTS**

#### **ORGANIZATION AND ADMINISTRATION OF EMERGENCY CARE**

- Developing and implementing emergency action plan, Emergency team. Initial patient assessment and care, Emergency equipment, Venue location, Emergency transportation, Emergency care facilities, Legal need and documentation

#### **PHYSICAL EXAMINATION OF THE CRITICALLY INJURED PATIENT/ATHLETE**

- Conduct Scene assessment, Vital signs and safety
- Description of Body substance, isolation precautions
- Differentiate between Primary survey and Secondary survey

#### **AIRWAY MANAGEMENT**

- Air way anatomy, Air way compromise, Oxygen therapy and advanced airway devices.

## **SUDDEN CARDIAC DEATH**

- Outline of Incidence, etiology of sudden death in general population, Sudden, cardiac arrest in athletes and Management of sudden cardiac arrest
- Identify Screening and recognition of cardiac warning signs.
- Preparation for cardiac emergencies

## **HEAD INJURIES**

- Patho-mechanics of brain injuries
- Identify cerebral concussion, contusion, cerebral hematoma, Second impact syndrome.
- Performing Initial on site assessment, Sideline assessment, Special tests for assessment of coordination and cognition

## **EMERGENCY CARE OF CERVICAL SPINE INJURIES**

- Mechanism of injuries to the spinal cord, Assessment and management.

## **EMERGENT GENERAL MEDICAL CONDITIONS**

- Identify Sudden death, Exercise induced anaphylaxis, acute asthma, Diabetes mellitus, Mononucleosis, Sickle cell traits and Hypertension.

## **ENVIRONMENT-RELATED CONDITIONS**

- Heat related emergencies, their prevention, Cold related injuries, Lightning and Altitude related emergencies.

## **ORTHOPEDIC INJURIES**

- Describe Basic emergency medical care, Fundamentals of skeletal fractures and
- Perform Splinting techniques for;
- Fractures and dislocations of upper extremity
- Fractures and dislocations of lower extremity
- Fractures and dislocations of spine.

## **ABDOMINAL INJURIES**

- Describe Initial evaluation of abdominal injuries
- Identify abdominal wall contusions, splenic injuries, liver injuries, renal injuries, intestinal injuries, pancreatic injuries, Non-traumatic abdominal injuries: Appendicitis, ectopic pregnancy.

## **THORACIC INJURIES**

- Describe initial Assessment and Management of different Types of injuries: fractures, Pneumothorax, hemothorax, pulmonary embolism.

## **THE PSYCHOLOGICAL AND EMOTIONAL IMPACT OF EMERGENCY SITUATIONS**

- Defining psychological trauma
- Describe Psychological trauma in athletic environment and Pharmacologic considerations for the physical therapist

- Define The psychological emergency response in both external and internal team members
- Describe the science behind the art the patient's interview.

### **EXAMINATION/EVALUATION**

- Prologue
- Symptoms investigation, Part I: Chief complaint by body region
- Symptoms investigation, Part II: Chief complaint by symptom
- Patient health history including identifying health risk factor
- Review of systems
- Patient interview: the physical examination begins
- Review of cardiovascular and pulmonary systems and vital signs
- Upper quadrant screening examination
- Lower quadrant screening examination\ Diagnostic imaging
- Laboratory tests and values.

### **DISORDERS AND MANAGEMENT**

- Acute Care Physical Therapy Examination and Discharge Planning.
- Clinical Laboratory Values and Diagnostic Testing.
- Physiologic Monitors and Patient Support Equipment.
- Bed Rest, Deconditioning, and Hospital-Acquired Neuromuscular Disorders.
- The Immune System and Infectious Diseases and Disorders.
- Cardiovascular Diseases and Disorders.
- Pulmonary Diseases and Disorders.
- Musculoskeletal/Orthopedic Diseases and Disorders
- Neurologic and Neurosurgical Diseases and Disorders.
- Endocrine Diseases and Disorders.
- Gastrointestinal Diseases and Disorders.
- Genitourinary Diseases and Disorders.
- Oncological Diseases and Disorders.
- Transplantation.
- Integumentary Diseases and Disorders
- Wound Management.

### **SPECIAL POPULATIONS**

- The Pediatric and adolescent population
- The obstetric client
- The geriatric population
- Health and wellness perspective in primary care.
- Basic Life Supports & Supervised Intra Muscular/Intra venous Injection Therapy

## **DISASTER MANAGEMENT**

- Floods
- Earth quakes
- Blasts
- Fire
- War
- Foods and communication in disasters

## **RECOMMENDED BOOKS**

1. *Emergency Care in Athletic Training* by: Keith M. Gorse, Robert O. Blanc, Francis Feld, Matthew Radelet, 1<sup>st</sup> edition, 2010, F.A Davis Company.
2. *Acute care hand book for Physical Therapists* by: Jaime C paz, Michelle P West, 2<sup>nd</sup> edition, 2002, Butterworth Heinemann.

**SUPERVISED CLINICAL PRACTICE – IV  
NEUROLOGICAL****CREDIT HOURSS 3(0-3)**

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
8	Supervised by trained PT	Evaluation, Examination, and Intervention	Neurological (IPD/OPD; Surgical&non -surgical)	Listed below

**COURSE DESCRIPTION**

During this supervised clinical practice, students are responsible for successful execution of examination, evaluation, and interventions relating to neurological disorders. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, pediatric and geriatric.) Students learn to objectively perform these skills under the supervision of trained physical therapists. Student is required to keep a performance record of all listed competencies and successfully perform on real patients during the final evaluation of the course.

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Learn the art of neurological examination
3. Execution of examination of neurological disorders
4. Evaluation and interventions relating to neurological disorders
5. Learn their skills under supervision of trained physical therapists
6. Performance of these skills in all settings (inpatient and outpatient)

**Course Learning Objectives:**

1. Teaching neurological skills specific to body disorders
2. Perform tests for each neurological condition to determine their diagnosis and treatment plan
3. Performance record of all listed competencies in clinical logbook
4. Objectively perform these skills under the supervision of trained physical therapists.

**COMPETENCIES EXAMINATION**

- Analyze data based on best available evidence select examination tests and measures that are appropriate for the patient/client.
- Perform posture tests and measures of postural alignment and positioning.
- Perform gait, locomotion and balance tests including quantitative and qualitative measures such as:

- Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
- Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
- Gait and locomotion during functional activities with or without the
  - use of assistive, adaptive, orthotic, protective, supportive, or
  - prosthetic devices or equipment to include:
- Bed mobility
- Transfers (level surfaces and floor)
- Wheelchair management
- Uneven surfaces
- Safety during gait, locomotion, and balance
- Perform gait assessment including step length, speed, characteristics of gait, and abnormal gait patterns.
- Recognize and characterize signs and symptoms of inflammation.
- Perform neurological tests and measures including:
- Arousal, attention and cognition tests and measures.
- Cranial and peripheral nerve integrity tests and measures.
- Motor distribution of the cranial nerves (eg, muscle tests, observations)
- Motor distribution of the peripheral nerves (eg, dynamometry, muscle tests observations, thoracic outlet tests)
- Response to neural provocation (e.g. tension test, vertebral artery compression tests)
- Response to stimuli, including auditory, gustatory, olfactory, pharyngeal, vestibular, and visual (eg, observations, provocation tests)
- Neuromotor development and sensory integration tests
- Acquisition and evolution of motor skills, including age-appropriate development
- Sensorimotor integration, including postural responses, equilibrium, and righting reactions
- Tests and measures for reflex integrity including:
- Deep reflexes (eg, myotatic reflex scale, observations, reflex tests)
- Postural reflexes and reactions, including righting, equilibrium and protective reactions
- Primitive reflexes and reactions, including developmental
- Resistance to passive stretch
- Superficial reflexes and reactions
- Resistance to velocity dependent movement

- Sensory integrity tests and measures that characterize or quantify including:
- Light touch
- Sharp/dull
- Temperature
- Deep pressure
- Localization
- Vibration
- Deep sensation
- Stereognosis
- Graphesthesia.

## **EVALUATION**

- Synthesize available data on a patient/client expressed in terms of the International
- Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation.
- Use available evidence in interpreting the examination findings.
- Verbalize possible alternatives when interpreting the examination
- Cite the evidence (patient/client history, lab diagnostics, tests and measures and scientific literature) to support a clinical decision.

## **DIAGNOSIS**

- Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (ie, practice patterns in the Guide)
- Identify and prioritize impairments in body functions and structures, and activity limitations and participation restrictions to determine specific body function and structure, and activities and participation towards which the intervention will be directed.

## **PROGNOSIS**

- Determine the predicted level of optimal functioning and the amount of time required to achieve that level.
- Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame including
- Age
- Medication(s)
- Socioeconomic status
- Co-morbidities
- Cognitive status
- Nutrition
- Social Support



## **PLAN OF CARE**

- Perform Goal setting, Coordination of Care, Progression of care, Discharge
- Design a Plan of Care
- Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes.
- Consult patient/client and/or caregivers to develop a mutually agreed to plan of care.
- Identify patient/client goals and expectations.
- Identify indications for consultation with other professionals.
- Make referral to resources needed by the patient/client (assumes knowledge of referral sources).
- Select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care
- identify precautions and contraindications,
- provide evidence for patient-centered interventions that are identified and selected,
- define the specificity of the intervention (time, intensity, duration, and frequency),
- Set realistic priorities that consider relative time duration in conjunction with family, caregivers, and other health care professionals).
- Establish criteria for discharge based on patient goals and current functioning and disability.

## **COORDINATION OF CARE**

- Identify who needs to collaborate in the plan of care.
- Identify additional patient/client needs that are beyond the scope of physical therapist practice, level of experience and expertise, and warrant referral
- Refer and discuss coordination of care with other health care professionals
- Articulate a specific rationale for a referral.
- Advocate for patient/client access to services.

## **PROGRESSION OF CARE**

- Identify outcome measures of progress relative to when to progress the patient further.
- Measure patient/client response to intervention.
- Monitor patient/client response to intervention.
- Modify elements of the plan of care and goals in response to changing patient/client status, as needed.
- Make on-going adjustments to interventions according to outcomes including environmental factors and personal factors and, medical therapeutic interventions.
- Make accurate decisions regarding intensity and frequency when adjusting interventions in the plan of care.

## **DISCHARGE PLAN**

- Re-examine patient/client if not meeting established criteria for discharge based on the plan of care.
- Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with re-evaluation.\*
- Prepare needed resources for patient/client to ensure timely discharge, including follow-up care.
- Include patient/client and family/caregiver as a partner in discharge.\*
- Discontinue care when services are no longer indicated.
- When services are still needed, seek resources and/or consult with others to identify alternative resources that may be available.
- Determine the need for equipment and initiate requests to obtain.

## **INTERVENTIONS**

- Perform Safety, Emergency Care, CPR and First Aid, Standard Precautions, Body Mechanics and Positioning
- Demonstrate appropriate sequencing of events related to universal precautions.
- Determine equipment to be used and assemble all sterile and non-sterile materials.
- Use transmission-based precautions.
- Demonstrate aseptic techniques.
- Apply sterile procedures.
- Properly discard soiled items.

## **APPLY BODY MECHANICS AND POSITIONING**

- Apply proper body mechanics (utilize, teach, reinforce, and observe) properly position, drape, and stabilize a patient/client when providing physical therapy.

## **INTERVENTIONS**

- Coordination, communication, and documentation may include:
- Addressing required functions:
- Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services.
- Discern the need to perform mandatory communication and reporting (eg, incident reports, patient advocacy and abuse reporting).
- Follow advance directives.

## **ADMISSION AND DISCHARGE PLANNING**

- Case management.
- Collaboration and coordination with agencies, including:

- Home care agencies
- Equipment suppliers
- Schools
- Transportation agencies
- Payer groups

## **COMMUNICATION ACROSS SETTINGS, INCLUDING**

- Case conferences
- Documentation
- Education plans
- Cost-effective resource utilization.
- Data collection, analysis, and reporting of:
- Outcome data
- Peer review findings
- Record reviews
- Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including:
- Elements of examination, evaluation, diagnosis, prognosis, and Intervention
- Changes in body structure and function, activities and participation.
- Changes in interventions
- Outcomes of intervention
- Interdisciplinary teamwork:
- Patient/client family meetings
- Patient care rounds
- Case conferences
- Referrals to other professionals or resources.
- Patient/client-related instruction may include:
- Instruction, education, and training of patients/clients and caregivers regarding:
- Current condition, health condition, impairments in body structure and function, and activity limitations, and participation restrictions)
- Enhancement of performance
- Plan of care:
- Risk factors for health condition, impairments in body structure and function, and activity limitations, and participation restrictions.
- Preferred interventions, alternative interventions, and alternative modes of delivery
- Expected outcome
- Health, wellness, and fitness programs (management of risk factors)

- Transitions across settings

## **THERAPEUTIC EXERCISE MAY INCLUDE PERFORMING**

Balance coordination and agility training:

- Developmental activities training
- Motor function (motor control and motor learning) training
- Neuromuscular education or reeducation
- Perceptual training
- Posture awareness training
- Sensory training or retraining
- Standardized, programmatic approaches
- Task-specific performance training
- **Neuromotor development training:**
- Developmental activities training\*
- Motor training
- Movement pattern training
- Neuromuscular education or reeducation
- Functional training in self-care and home management may include
- Functional training in work (job/school/play), community, and leisure integration or reintegration may include
- Activities of daily living (ADL) training: Bed mobility and transfer training, Age appropriate functional skills
- Barrier accommodations or modifications
- Device and equipment use and training:
- Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)\*
- Orthotic, protective, or supportive device or equipment training during self-care and home management\*
- Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)\*
- Functional training programs:
- Simulated environments and tasks\*
- Task adaptation
- Injury prevention or reduction:
- Safety awareness training during self-care and home management\*
- Injury prevention education during self-care and home management
- Injury prevention or reduction with use of devices and equipment
- Prescription, application, and, as appropriate, fabrication of devices and equipment may include:
- Adaptive devices:

- Hospital beds
- Raised toilet seats
- Seating systems – prefabricated
- Assistive devices:
- Canes
- Crutches
- Long-handled reachers
- Static and dynamic splints – prefabricated
- Walkers
- Wheelchairs
- Orthotic devices:
- Prefabricated braces
- Prefabricated shoe inserts
- Prefabricated splints
- Prosthetic devices (lower-extremity)
- Protective devices:
- Braces
- Cushions
- Helmets
- Protective taping
- Supportive devices
- Prefabricated compression garments
- Corsets
- Elastic wraps
- Neck collars
- Slings
- Supplemental oxygen - apply and adjust
- Supportive taping
- Electrotherapeutic modalities may include:
- Biofeedback
- Electrotherapeutic delivery of medications (eg, iontophoresis)
- Electrical stimulation: Electrical muscle stimulation (EMS), Functional electrical stimulation (FES) High voltage pulsed current (HVPC) Neuromuscular electrical stimulation (NMES) Transcutaneous electrical nerve stimulation (TENS)
- Physical agents and mechanical modalities may include: *Physical agents*;
- Cryotherapy
- Cold packs
- Ice massage
- Vapocoolant spray

- Hydrotherapy
- Contrast bath
- Pools
- Whirlpool tanks
- Sound agents
- Phonophoresis
- Ultrasound
- Thermotherapy
- Dry heat
- Hot packs
- Paraffin baths
- Mechanical modalities:
- Compression therapies (prefabricated)
- Compression garments: Skill Category Description of Minimum Skills
- Vasopneumatic compression devices\*
- Taping
- Compression bandaging (excluding lymphedema)
- Gravity-assisted compression devices:
- Standing frame
- Tilt table
- Mechanical motion devices
- Continuous passive motion (CPM)
- Traction devices
- Intermittent
- Positional
- Sustained
- Documentation of all listed competencies in SOAP notes format.

### **Note**

It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical log book duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

## NINTH SEMESTER

Sr.No.	Course Title	Credit Hours
<b>FIFTH PROFESSIONAL YEAR</b>		
1	CARDIOPULMONARY PHYSICAL THERAPY (Theory) CARDIOPULMONARY PHYSICAL THERAPY (Practical)	3(2-1)
2	PROSTHETICS & ORTHOTICS	2(2-0)
3	CLINICAL DECISION MAKING & DIFFERENTIAL DIAGNOSIS	3(3-0)
4	MANUAL THERAPY (Theory) MANUAL THERAPY (Practical)	3(2-1)
5	INTEGUMENTRY PHYSICAL THERAPY (Theory)	2(2-0)
6	SUPERVISED CLINICAL PRACTICE V (Practical)	4(0-4)
<b>Total Credit Hours in Semester-9</b>		<b>17</b>

## **CARDIOPULMONARY PHYSICAL THERAPY CREDIT HOURS 3(2-1)**

### **COURSE DESCRIPTION**

This course includes applied anatomy, applied physiology and pathology of the cardiopulmonary system. This course discuss relevant tests and measures for determining impairment and differentiating the diagnosis based on the specificity and sensitivity of the assessment instruments as related to patients with cardiopulmonary systems disorders. The use of evidence-based physical therapy intervention for cardiopulmonary systems disorders is emphasized. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Demonstrate a basic knowledge of applied anatomy, physiology & pathology of the cardiopulmonary system
3. Demonstrate, evaluate and perform examinations in cardiopulmonary conditions
4. Apply evidence based physical therapy interventions

### **Course Learning Objectives:**

1. Describe applied anatomy, applied physiology and pathology of the cardiopulmonary system
2. Introduction of medical terminologies related to the cardiopulmonary system
3. Discuss relevant tests and measures for determining impairment
4. Differentiating the diagnosis based on the specificity and sensitivity of the assessment instruments as related to patients with cardiopulmonary system disorders
5. Design evidence-based physical therapy interventions for cardiopulmonary systems
6. Examination, evaluation, and comparing contemporary traditional interventions
7. Discuss the impact of evolving technology in cardiac rehabilitation

## **COURSE CONTENTS**

### **MEDICAL TERMINOLOGY REGARDING CARDIOPULMONARY SYSTEM**

#### **INTRODUCTION**

#### **APPLIED ANATOMY AND PHYSIOLOGY**

- Anatomy of the Cardiovascular and Respiratory Systems
- Physiology of the Cardiovascular and Respiratory Systems.



## **PATHO-PHYSIOLOGY**

- Ischemic Cardiac Condition
- Cardiac Muscle Dysfunction
- Restrictive Lung Dysfunction
- Chronic Obstructive Pulmonary Diseases
- Cardiopulmonary Implications of Specific Diseases.

## **DIAGNOSTIC TESTS AND PROCEDURES**

- Cardiovascular Diagnostic Tests and procedures
- Electro cardio-graphy
- Pulmonary Diagnostic Tests and Procedures.

## **SURGICAL INTERVENTIONS, MONITORING AND SUPPORT**

- Cardiovascular and Thoracic interventions
- Thoracic Organ Transplantation; Heart, Lung, and heart-Lung
- Monitoring and Life-Support Equipment.

## **CARDIOPULMONARY ASSESSMENT AND INTERVENTION**

- Assessment Procedures
- Treatment of Acute Cardiopulmonary Conditions
- Therapeutic Interventions in Cardiac Rehabilitation and Prevention
- Pulmonary Rehabilitation
- Outcome Measures.

## **THE NEEDS OF SPECIFIC PATIENTS**

### **INTENSIVE CARE FOR THE CRITICALLY ILL ADULT**

- Assessment of the critically ill patient in the intensive care unit (ICU)
- Mechanical ventilation - implications for physiotherapy
- Musculoskeletal problems
- Patient groups with specific needs
- Systemic inflammatory response syndrome (SIRS) and sepsis
- Acute respiratory distress syndrome (ARDS)
- Disseminated intravascular coagulation (DIC)
- Inhalation burns
- Trauma
- Neurological conditions requiring intensive care
- Physiotherapy techniques
- Emergency situations.

### **PULMONARY REHABILITATION**

- Definition and aims of pulmonary rehabilitation
- Benefits of pulmonary rehabilitation
- Setting up pulmonary rehabilitation
- Resources
- Selection of patients

- Patient assessment for pulmonary rehabilitation
- Structure of pulmonary rehabilitation
- Pulmonary rehabilitation team
- Exercise component
- Outcome measures.

## **CARDIAC REHABILITATION**

- Introduction
- Goals of cardiac rehabilitation
- Cardiac rehabilitation team
- Role of the physiotherapist
- Rationale for cardiac rehabilitation
- Early ambulation
- Exercise training
- Secondary prevention
- Education
- Manifestations of ischaemic heart disease
- Cardiac arrest
- Angina pectoris
- Myocardial infarction
- Cardiac surgery
- Drugs to control the cardiovascular system
- Physiotherapy
- Assessment
- Recording
- Treatment
- Outcome evaluation
- Complications of exercise
- Other considerations
- The older patient
- Cardiac failure
- Valvular heart disease
- Congenital heart disease
- Compliance
- Cost-effectiveness
- Legal aspects.

## **CARDIOPULMONARY TRANSPLANTATION (Overview with reference to the Physical Therapist)**

- Introduction
- Assessment
- The transplantation process

- Donors
- Operative procedures
- Postoperative care
- Rejection of the transplanted organs
- Immunosuppressant
- Special considerations for the physiotherapist
- Denervation of the heart/lungs
- Infection/rejection
- Physiotherapy management.

## **HYPERVENTILATION**

- Introduction
- Signs and symptoms
- Causes of hyperventilation
- Personality
- Diagnostic tests
- Breathing patterns
- Treatment
- The assessment
- Treatment plan
- Breathing education
- Breathing pattern re-education
- Compensatory procedures in the short term
- Planned rebreathing
- Speech
- Home programme
- Exercise and fitness programme
- Group therapy.

## **BRONCHIECTASIS, PRIMARY CILIARY DYSKINESIA AND CYSTIC FIBROSIS**

- Bronchiectasis
- Medical management
- Physiotherapy
- Evaluation of physiotherapy
- Primary ciliary dyskinesia
- Medical management
- Physiotherapy
- Evaluation of physiotherapy
- Cystic fibrosis
- Medical management
- Physiotherapy

- Evaluation of physiotherapy
- Continuity of care.

### **LAB WORK**

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based cardiopulmonary Physical Therapy Treatment protocols.
- Airway clearance
- Breathing exercises
- Postural drainage
- Cardio pulmonary exercise prescriptions
- Practical related to the course work

### **RECOMMENDED BOOKS**

1. Physiotherapy in Respiratory Care; An evidence based approach to respiratory and cardiac management, By Alexandra Hough (3<sup>rd</sup> Edition) Nelson Thornes.
2. Essentials of Cardiopulmonary Physical Therapy (2<sup>nd</sup> Edition) By Hillegass and Sadowsky.
3. *Physiotherapy for respiratory and cardiac problems*, By: Jennifer A. Pryor & Barbara A. Webber, 2<sup>nd</sup> edition, Churchill Livingstone.
4. *Tidy's Physiotherapy* by Thomas A Skinner & Piercy.
5. *Therapeutics Exercises and Technique* by Carolyn Kisner&Laynn Allen Colby 5<sup>th</sup> & 6th edition.
6. *Cash's Text book of General Medical & Surgical Condition for Physiotherapists* by Patrica A. Downie.
7. *Cash's Textbook of chest, heart and vascular condition for physiotherapist* by Patrica A. Downie.
8. *Chest Physio for the War wounded*, by Mahboob-urRehman, National Book Foundation.

## **PROSTHETICS & ORTHOTICS**

**CREDIT HOURS 2(2-0)**

### **COURSE DESCRIPTION**

This course intends to study prosthetic and orthotic management as applied to a variety of patient populations across a life span. It also addresses the considerations of various pathologies and medical, surgical management to formulate appropriate patient examinations, evaluation, diagnosis, prognosis and intervention that are consistent with physical therapy practice guidelines. Principles of normal biomechanics, pathomechanics, physiology and Pathophysiology will be a major focus for evaluation, intervention and education of the vascular, neuromuscular, and / or musculoskeletal compromised patient to utilize prosthetic or orthotic devices. Basic principles of mechanical physics and material characteristics will be applied.

### **Course Learning Outcomes**

1. At the end of the semester students should be able to
2. Manage a variety of patient populations using prosthetic and orthotics across a life-span
3. Formulate appropriate patient examinations, evaluation, diagnosis, prognosis and interventions that are consistent with physical therapy practice guidelines.

### **Course Learning Objectives:**

1. Define basic terminology, biomechanical principles and manufacturing methods of orthotics.
2. Evaluation procedures of orthotics and prosthesis for different joints of the body
3. Define prosthesis design of the upper and lower limb
4. Describe amputation and their rehabilitation
5. Design goal setting and treatment plan.

## **COURSE CONTENTS**

### **ORTHOTICS**

#### **INTRODUCTION TO ORTHOTICS**

- Basic Terminology
- Historical Background
- Factors In Prescription Orthotics
- Nomenclature of Orthotics
- Biomechanical Principles
- Materials Used in Orthotics Manufacturing
- Methods of Construction.

#### **FOOT ORTHOSES**

- Shoe Style
- Parts of Shoes

- Special Purpose Shoes
- Foot Examination
- Orthotics Interventions
- Fabrication Options
- Pediatric Foot Orthoses
- Guideline for Prescription Foot Orthoses.

### **ANKLE FOOT ORTHOSES**

- Plastic Ankle Foot Orthoses
- Lather Metal Ankle Foot Orthoses
- Composite Materials
- Weight Relieving Ankle Foot Orthoses
- Support (Fabric , Leather, Gel And Air )
- Contracture Reducing Ankle Foot Orthoses
- Guidelines for Prescription Ankle Foot Orthoses.

### **KNEE ANKLE FOOT ORTHOSES AND KNEE ORTHOSES**

- Plastic Metal Knee Ankle Foot Orthoses
- Knee Immobilizer
- Supra- Condylar Knee Ankle Foot Orthoses
- Weight Relieving Orthoses, Fracture Orthoses
- Lather Metal Knee Ankle Foot Orthoses
- Knee Orthoses
- Guidelines for Prescription Knee Ankle Foot Orthoses.

### **ORTHOSES FOR PARAPLEGIA AND HIP DISORDERS**

- Paraplegia
- Standing Frames
- Orthoses Designed For Ambulation
- Functional Electrical Stimulation
- Specific Devices for Paraplegia
- Hip Orthoses
- Guidelines for Prescription.

### **EVALUATION PROCEDURES FOR LOWER LIMB ORTHOSES**

- Need of Evaluation
- Static Evaluation
- Dynamic Evaluation
- Gait Disorders with Orthoses Usage.

### **TRUNK AND CERVICAL ORTHOSES**

- Trunk Orthoses
- Trunk Orthoses Evaluation
- Scoliosis and Kyphosis Orthoses
- Scoliosis And Kyphosis Orthoses Evaluation

- Cervical Orthoses
- Cervical Orthoses Evaluation
- Guideline for Prescription.

### **UPPER LIMB ORTHOSES**

- Hand And Wrist Hand Orthoses
- Forearm And Elbow Orthoses
- Shoulder Orthoses, Fabrication Option
- Upper limb Orthoses Evaluation (Hand, Wrist, Fingers, Shoulder and Elbow)
- Guideline for Prescription.

### **ORTHOSES FOR BURNS AND OTHER SOFT TISSUE DISORDERS**

- Importance of Orthoses for Burns and Other Soft Tissue Disorders
- Orthoses for Burn Management
- Orthoses for Patients with Soft Tissues Problem Associated With Neuromuscular Disorders.

### **GOAL SETTING AND TREATMENT PLAN**

- Long-Term Goals
- Short-Term Goals
- Treatment Planning
- Criteria for Discharge
- Care of Orthoses.

### **PROSTHETICS**

#### **EARLY MANAGEMENT**

- Clinic Team Approach to Rehabilitation
- Amputation Surgery: Osteomyoplastic Reconstructive Technique
- Postoperative Management
- Pain Management
- Skin Disorders and Their Management
- Psychological Consequences of Amputation.

#### **REHABILITATION OF ADULTS WITH LOWER-LIMB AMPUTATIONS**

- Partial Foot and Syme's Amputations and Prosthetic Designs
- Transtibial Prosthetic Designs
- Transfemoral Prosthetic Designs
- Hip Disarticulations and Transpelvic Prosthetic Designs
- Basic Lower-Limb Prosthetic Training.

#### **REHABILITATION OF ADULTS WITH UPPER-LIMB AMPUTATIONS**

- Body-Powered Upper-Limb Prosthetic Designs
- Upper-Limb Externally Powered Prosthetic Designs
- Training Patients with Upper-Limb Amputations.

## **BEYOND THE BASICS**

- Special Considerations with Children
- Rehabilitation Outcomes
- Adaptive Prostheses for Recreation
- Future Prosthetic Advances and Challenges
- Future Surgical and Educational Advances and Challenges.

## **RECOMMENDED BOOKS**

1. Prosthetics and Patient Management: A Comprehensive Clinical Approach By: Kevin Carroll; Joan Edelstein.
2. Orthotics a comprehensive clinical approach By: Joan E Eldestein& Jan Bruckner.



## **CLINICAL DECISION MAKING & DIFFERENTIAL DIAGNOSIS**

**CREDIT HOURS 3(3-0)**

### **COURSE DESCRIPTION**

The course will cover the principles and methods of clinical screening in physical therapy practice. A basic format for musculoskeletal, neuromuscular, Integumentary, and cardiopulmonary screening in physical therapy will be presented, with a focus on differential diagnosis within the scope of physical therapy practice, and incorporation of the role of the physical therapist as it interfaces with the role of the physician. A clarification of red-flags that differentiate a systemic condition from a neuro-musculoskeletal condition will be a continuing theme throughout the course. Decision-making skills related to physical therapy will be emphasized through the use of patient case scenarios with a focus on when to treat, and when to refer. Strategies to effectively and appropriately communicate with health care colleagues and patients regarding medical diagnostic information and medical status will be introduced.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Discuss screening and differentiate medical conditions
3. Discuss clinical decision making in physical therapy

### **Course Learning Objectives:**

1. Understand an in-depth exploration of the assessment and intervention procedures used with persons with various neurological pathologies
2. Understand the principles and methods of clinical screening in physical therapy practice
3. Understand the basic format for musculoskeletal, neuromuscular, integumentary, and cardiopulmonary screening in physical therapy that will be presented, with a focus on differential diagnoses within the scope of physical therapy practice, and incorporation of the role of the physical therapist as it interfaces with the role of the physician
4. Understand clarification of red flags that differentiate a systemic condition from a neuroma musculoskeletal condition will be a continuing theme throughout the course.
5. Understand decision-making skills related to physical therapy which will be emphasized through the use of patient case scenarios with a focus on when to treat, and when to refer
6. Understand strategies to effectively and appropriately communicate with health-care colleagues and patients regarding medical diagnostic information.

## **COURSE CONTENTS**

### **SCREENING AND INTERVIEWING, THE PT SCOPE OF PRACTICE: TO REFER OR TREATINTRODUCTION TO SCREENING FOR REFERRAL IN PHYSICAL THERAPY**

- Reasons to Screen
- Screenings and Surveillance
- Diagnosis by the Physical Therapist
- Differential Diagnosis Versus Screening
- Direct Access
- Decision-Making Process
- Case Examples and Case Studies.

### **INTRODUCTION TO THE INTERVIEWING PROCESS**

- Concepts in Communication
- Cultural Competence
- The Screening Interview
- Subjective Examination
- Core Interview
- Hospital Inpatient Information
- Physician Referral.

### **OVERVIEW OF THE PHYSIOLOGY OF PAIN AND SYSTEMIC CAUSES OF PAIN**

- Mechanisms of Referred Visceral Pain
- Multi segmental Innervations
- Assessment of Pain and Symptoms
- Sources of Pain
- Types of Pain
- Comparison of Systemic Versus Musculoskeletal Pain
- Patterns
- Characteristics of Viscerogenic Pain,
- Screening for Emotional and Psychologic Overlay
- Screening for Systemic Versus Psychogenic
- Symptoms
- Physician Referral.

### **PHYSICAL ASSESSMENT AS A SCREENING TOOL**

- General Survey
- Techniques of Physical Examination
- Integumentary Screening Examination
- Nail Bed Assessment
- Lymph Node Palpation

- Musculoskeletal Screening Examination
- Neurologic Screening Examination
- Regional Screening Examination
- Systems Review
- Physician Referral.

#### **SCREENING FOR HEMATOLOGIC DISEASE**

- Signs and Symptoms of Hematologic Disorders
- Classification of Blood Disorders
- Physician Referral.

#### **SCREENING FOR CARDIOVASCULAR DISEASE**

- Signs and Symptoms of Cardiovascular Disease
- Cardiac Pathophysiology
- Cardiovascular Disorders
- Laboratory Values.

#### **SCREENING FOR THE EFFECTS OF CARDIOVASCULAR MEDICATIONS**

- Physician Referral.

#### **SCREENING FOR PULMONARY DISEASE**

- Signs and Symptoms of Pulmonary Disorders
- Inflammatory/Infectious Disease
- Genetic Disease of the Lung
- Occupational Lung Diseases
- Pleuropulmonary Disorders
- Physician Referral.

#### **SCREENING FOR GASTROINTESTINAL DISEASE**

- Signs and Symptoms of Gastrointestinal Disorders
- Gastrointestinal Disorders
- Physician Referral.

#### **SCREENING FOR HEPATIC AND BILIARY DISEASE**

- Hepatic and Biliary Signs and Symptoms
- Hepatic and Biliary Pathophysiology
- Gallbladder and Duct Diseases
- Physician Referral.

#### **SCREENING FOR UROGENITAL DISEASE**

- Signs and Symptoms of Renal and Urological Disorders,
- The Urinary Tract
- Renal and Urological Pain
- Renal and Urinary Tract Problems
- Physician Referral.

#### **SCREENING FOR ENDOCRINE AND METABOLIC DISEASE**

- Associated Neuromuscular and Musculoskeletal Signs and Symptoms
- Endocrine Pathophysiology
- Introduction to Metabolism
- Physician Referral.

### **SCREENING FOR IMMUNOLOGIC DISEASE**

- Using the Screening Model
- Immune System Pathophysiology
- Physician Referral
- Screening for Cancer
- Cancer Statistics
- Risk Factor Assessment
- Cancer Prevention
- Major Types of Cancer
- Metastases
- Clinical Manifestations of Malignancy
- Oncologic Pain
- Side Effects of Cancer Treatment
- Cancers of the Musculoskeletal System
- Primary Central Nervous System Tumors
- Cancers of the Blood and Lymph System
- Physician Referral.

### **SCREENING THE HEAD, NECK, AND BACK**

- Using the Screening Model to Evaluate the Head, Neck, or Back,
- Location of Pain and Symptoms
- Sources of Pain and Symptoms
- Screening for Oncologic Causes of Back Pain
- Screening for Cardiac Causes of Neck and Back Pain
- Screening for Peripheral Vascular Causes of Back Pain
- Screening for Pulmonary Causes of Neck and Back Pain
- Screening for Renal and Urologic Causes of Back Pain,
- Screening for Gastrointestinal Causes of Back Pain
- Screening for Liver and Biliary Causes of Back Pain
- Screening for Gynecologic Causes of Back Pain
- Screening for Male Reproductive Causes of Back Pain
- Screening for Infectious Causes of Back Pain
- Physician Referral.

### **SCREENING THE SACRUM, SACROILIAC, AND PELVIS**

- The Sacrum and Sacroiliac Joint
- The Coccyx
- The Pelvis

- Physician Referral.

### **SCREENING THE LOWER QUADRANT: BUTTOCK, HIP, GROIN, THIGH, AND LEG**

- Using the Screening Model to Evaluate the Lower Quadrant
- Trauma as a Cause of Hip, Groin, or Lower Quadrant Pain
- Screening for Systemic Causes of Sciatica
- Screening for Oncologic Causes of Lower Quadrant Pain
- Screening for Urologic Causes of Buttock, Hip, Groin, or Thigh Pain
- Screening for Male Reproductive Causes of Groin Pain
- Screening for Infectious and Inflammatory Causes of Lower Quadrant Pain
- Screening for Gastrointestinal Causes of Lower Quadrant Pain
- Screening for Vascular Causes of Lower Quadrant Pain
- Screening for Other Causes of Lower Quadrant Pain
- Physician Referral.

### **SCREENING THE CHEST, BREASTS, AND RIBS**

- Using the Screening Model to Evaluate the Chest, Breasts, or Ribs
- Screening for Oncologic Causes of Chest or Rib Pain
- Screening for Cardiovascular Causes of Chest, Breast, or Rib Pain
- Screening for Pleuropulmonary Causes of Chest, Breast, or Rib Pain
- Screening for Gastrointestinal Causes of Chest, Breast, or Rib Pain
- Screening for Breast Conditions that Cause Chest or Breast Pain
- Screening for Other Conditions as a Cause of Chest, Breast, or Rib Pain
- Screening for Musculoskeletal Causes of Chest, Breast, or Rib Pain
- Screening for Neuromuscular or Neurologic Causes of Chest, Breast, or Rib Pain
- Physician Referral.

### **SCREENING THE SHOULDER AND UPPER EXTREMITY**

- Using the Screening Model to Evaluate Shoulder and Upper Extremity
- Screening for Pulmonary Causes of Shoulder Pain
- Screening for Cardiac Causes of Shoulder Pain
- Screening for Gastrointestinal Causes of Shoulder Pain
- Screening for Liver and Biliary Causes of Shoulder Pain
- Screening for Rheumatic Causes of Shoulder Pain
- Screening for Infectious Causes of Shoulder Pain
- Screening for Oncologic Causes of Shoulder Pain
- Screening for Gynecologic Causes of Shoulder Pain
- Physician Referral.

## **CLINICAL DECISION MAKING (CDM)**

- Definition
- Process of CDM
- Skills required for CDM
- Models of CDM

## **RECOMMENDED BOOKS**

1. Goodman CC, Snyder TEK. *Differential Diagnostics for Physical Therapists: Screening for Referral*. Saint Louis, MO: Saunders: Elsevier; 2006. ISBN: 978-0-7216-0619-4.
2. APTA. *Guide to Physical Therapy Practice: Revised second edition*. Alexandria, VA: American Physical Therapy Association; 2003. ISBN: 978-1-887759-85.
3. Additional readings as assigned by the instructors.

## **MANUAL THERAPY**

**CREDIT HOURS 3(2-1)**

### **COURSE DESCRIPTION**

This course provides review of all Manual Therapy techniques, covering spine, peripheral joint mobilizations, Temporo-Mandibular joint, advanced myofascial trigger point therapy, Proprioceptive training, muscle energy techniques, strain counter strain techniques, neuromobilization combination techniques and mobilization, manipulation techniques.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Provide the best evidence in state-of-the-art advanced manual therapy. A detailed overall review of all manual therapy techniques, thorough evaluation, assessment, and technique selection training will take place
3. On-site demonstration and hands-on practice

### **COURSE LEARNING OBJECTIVES:**

1. Perform Maitland, mulligan and NAGS and SNAGS mobilization techniques and also know about their grades
2. Explain cervical, thoracic, and lumbar syndromes
3. Perform physical examination of the patient
4. Demonstrate translatory joint play movements.
5. Perform OMT evaluation, their indications and contraindications and treatment.
6. Integration of manual therapy

### **COURSE CONTENTS**

#### **FOUNDATION CONCEPTS TO MANUAL THERAPY**

#### **OMT KALTENBORN-EVJENTH CONCEPT**

- History
- Special features
- Overview.

### **PRINCIPLES**

#### **SPINAL MOVEMENT**

- The mobile segment
- Spinal range of movement
- Joint positioning for evaluation and treatment
- Three-dimensional joint positioning
- Resting position
- Actual resting position
- Non resting positions

- Joint locking
- Bone and joint movement
- Rotations of a vertebral bone
- Standard bone movements
- Combined bone movements
- Coupled movements
- Non coupled movements
- Joint roll-gliding associated with bone rotations
- Joint roll-gliding
- Abnormal roll-gliding
- Translation of vertebral bone
- Joint play associated with bone translation.

### **TRANSLATORIC JOINT PLAY**

- The Kaltenbom Treatment Plane
- Translatoric Joint Play Movements
- Determining the direction of restricted gliding
- Glide test
- Kaltenbom Convex-Concave Rule
- Grades of translatoric movement
- Normal grades of translatoric movement (Grades I - III)
- Palpating resistance to normal movement
- Pathological grades of translatoric movement
- Using translatoric grades of movement.

### **TESTS OF FUNCTION**

- Principles of function testing
- Assessing quantity of movement
- Measuring rotatoric movement with a device
- Manual grading of rotatoric movement ( - scale)
- Assessing quality of movement
- Quality of movement to the first stop
- End-feel: Quality of movement after the first stop
- Elements of function testing
- Active and passive rotatoric movements
- Testing rotatoric movement
- Localization tests
- Differentiating articular from extra-articular dysfunction
- Differentiating muscle shortening from muscle spasm
- Translatoric joint play tests
- Resisted movements
- Passive soft tissue movements



- Additional tests.

### **OMT EVALUATION**

- Goals of the OMT evaluation
- Physical diagnosis
- Indications and contraindications
- Measuring progress
- Elements of the OMT evaluation
- Screening exam
- Detailed exam
- History
- inspection
- Tests of function
- Palpation
- Neurologic and vascular tests
- Medical diagnostic studies
- Diagnosis and trial treatment.

### **SPINAL JOINT MOBILIZATION**

- Goals of joint mobilization
- Mobilization techniques
- Pain relief mobilization
- Pain-relief traction mobilization (Grade I -IISZ)
- Vibrations and oscillations
- Relaxation mobilization
- Relaxation-traction mobilization (Grade I -II)
- Stretch mobilization
- Stretch-traction mobilization (Grade III)
- Stretch-glide mobilization (Grade /)
- Manipulation
- If traction exacerbates symptoms
- A voiding high-risk manual treatment
- Rotation mobilization
- Joint compression.

### **OMT TREATMENT**

- Elements of OMT
- Treatment to relieve symptoms
- Immobilization
- Thermo-Hydro-Electric (T-H-E) therapy
- Pain-relief mobilization
- Special procedures for pain relief

- Treatment to increase mobility
- Soft tissue mobilization
- Passive soft tissue mobilization
- Active-facilitated soft tissue mobilization
- Muscle stretching principles
- Joint mobilization to increase mobility
- Neural tissue mobilization
- Specialized exercise to increase mobility
- Treatment to limit movement
- To inform, instruct and train
- Research.

### **SPINAL SYNDROMES**

- Notes on spinal syndromes
- Cervical syndromes
- Thoracic syndromes
- Lumbar syndromes
- Neurologic evaluation of nerve root syndromes
- Sensory innervation of the skin
- Sensory innervation of deep structures
- Motor innervation
- Common nerve root syndromes.

### **MANUAL THERAPY ASSESSMENT**

- The Maitland's and Mulligan concept
- Subjective examination
- Physical examination
- Examination of the temporomandibular joint
- Examination of the upper cervical spine
- Examination of the cervicothoracic spine
- Examination of the thoracic spine
- Examination of the lumbar spine.

### **THE SUBJECTIVE EXAMINATION STEP BY STEP**

- Introduction
- Body chart
- Behavior of symptoms
- Special questions
- History of the present condition (HPC)
- Past medical history (PM H)
- Social and family history (SH, FH)
- Plan of the physical examination
- Case scenarios

- Counterfeit clinical presentations.

## **PHYSICAL EXAMINATION STEP- BY-STEP**

- Introduction
- Observation
- Joint tests
- Muscle tests
- Neurological tests
- Special tests
- Functional ability
- Palpation
- Accessory movements
- Completion of the physical examination.

## **TECHNIQUE PRINCIPLES**

- Learning manual techniques
- Applying manual techniques
- Objective
- Starting position
- Patient's position
- Therapist's position
- Hand placement and fixation/stabilization
- Grip
- Therapist 's stable hand
- Therapist's moving hand
- Procedure
- Joint pre-positioning
- Mobilization technique
- Symbols
- Recording
- Identifying an intervertebral segment
- The Star Diagram.

## **PELVIS**

- Functional anatomy and movement
- Notes on evaluation and treatment
- Pelvis tests and mobilizations

## **LUMBAR SPINE**

- Functional anatomy and movement
- Notes on evaluation and treatment
- Lumbar tests and mobilizations

## **THORACIC SPINE AND RIBS**

- Functional anatomy and movement

- Notes on evaluation and treatment
- Thoracic tests and mobilizations.

### **CERVICAL SPINE**

- Functional anatomy and movement
- Notes on evaluation and treatment
- Cervical tests and mobilizations.

### **UPPER CERVICAL SPINE**

- Functional anatomy and movement
- Notes on evaluation and treatment
- Upper cervical tests and mobilizations.

### **JAW**

- Functional anatomy and movement
- Jaw examination scheme
- Jaw tests and mobilizations.

### **SPINAL MOBILIZATIONS**

#### **THE CERVICAL AND UPPER THORACIC SPINES**

- NAGS
- REVERSE NAGS
- SNAGS
- SELF SNAGS
- Spinal Mobilization with arm Movement
- Other mobilization with movement techniques (MWMS) for the Cervical and Upper Thoracic Spines.

#### **THE UPPER CERVICAL SPINE SPECIAL TECHNIQUES**

- The acute Wry Neck
- Headaches
- Vertigo, Nausea and other vertebral artery Signs.

#### **THE LUMBAR SPINE**

- SNAGS
- SELF SNAGS

#### **THE SACROILIAC JOINTS (S/I) JOINTS**

#### **THE THORACIC SPINE**

#### **THE RIB CAGE**

#### **PERIPHERAL JOINT MOBILIZATION TECHNIQUES**

#### **INTEGRATIVE MANUAL THERAPY**

- Postural Compensations of the spine
- Muscle Energy and 'Beyond' Technique for the spine
- Treatment of spine Hypertonicity for Synergic Pattern
- Release with Strain and Counter strain Technique
- Myofascial Release

- Tendon Release Therapy for Treatment of Tendon Tissue Tension with Advanced Strain and Counter strain Technique
- Ligaments: a Tensile Force Guidance System: Treatment with Ligament Fiber Therapy
- Procedures and Protocols to correct spinal Dysfunction with Integrative Manual Therapy.

## LAB WORK

In the laboratory sessions, Supervised evaluation and manual therapy treatment techniques will be demonstrated and practiced, including joint and soft-tissue mobilization, manipulations, and posture and movement retraining in the physiotherapy clinic/Ward and Orthopaedic clinic/Ward, Indoor as well as outdoor. Various reflective case studies related to manual therapy of the spine and TM joint will be assigned to the students.

## RECOMMENDED BOOKS

1. *Manual Mobilization of the Joints TheKaltenborn Method of Joint. Examination and Treatment Volume I, The Extremities* By: Freddy M. Kaltenbom in collaboration with Olaf Evjenth, TraudiBaldauf. Kaltenbom, Dennis Morgan, and Eileen Vollowitz,OPTP Minneapolis, Minnesota, USA.
2. *Manual Therapy* By: Ola Grimsby, the Ola Grimsby institute San Diego.
3. *Integrative Manual therapy for the upper and lower extremities* By: Sharon weiselfish, North Atlantic books Berkeley, California.
4. *Orthopedic manual therapy an evidence-based approach* by: Chad Cook.
5. *Orthopaedic Manual Therapy Diagnosis Spine and Temporomandibular Joints* By: Aad van der.
6. *Translatory Spinal Manipulation* By: John R. Krauss, Olaf Evjenth, and Doug Creighton John R. Krauss A Lakeview Media L. L.C. Publication.
7. *euromusculoskeletal Examination and Assessment A Handbook for Therapists.*
8. By: Nicola J Petty, Ann P Moore &G D Maitland, Second Edition Churchill Livingstone.
9. *Myofascial Manipulation Theory and Clinical Application*, Second Edition By: Robert I. Cantu, Alan J. Grodin an Aspen Publication Aspen Publishers, Inc. Gaithersburg, Maryland 2001.
10. *Maitland's Vertebral Manipulation* Seventh Edition By: Geoffrey D. Maitland.
11. *Musculoskeletal manual medicine, diagnosis and treatment* by Jiri Dovark, Vaclav Dovark, Werneir Schneider etc.
12. *Manual therapy, NAGS, SNAGS, MWMS etc*by Brian R Mulligan fifth edition.

## **PROFESSIONAL PRACTICE IN PHYSICAL THERAPY**

### **CREDIT HOURS 2(2-0)**

#### **COURSE DESCRIPTION**

The course will discuss the role, responsibility, ethics administration issues and accountability of the physical therapists. The course will also cover the changes in the profession and its responsibilities to the profession, the public and to the health care team.

#### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Discuss the role, responsibility, ethics administration issues and accountability of the physical therapists

#### **Course Learning Objectives:**

1. Discuss cultural competencies
2. Discuss education techniques
3. Discuss ethics, law and administration in physical therapy practices.

### **COURSE CONTENTS**

#### **THE PHYSICAL THERAPIST AS PROFESSIONAL**

- What does professional mean?
- Preliminary definitions of profession and professional
- Sociological perspective
- Structural approach
- Processual approach
- Characteristics of professions cited in the literature
- Power approach
- Dimensions of occupation & profession
- Autonomy, self-regulation of ethical standards, and accountability
- Privileges of autonomous practice in 2020
- Self-regulation of ethical standards
- Accountability of professionals
- Individual professionalism—professionalism without professions?
- The history of a profession
- Professional recognition.

#### **CONTEMPORARY PRACTICE ISSUES**

- A vision for the future
- The doctorate in physical therapy
- Perspective of the profession
- Perspective of the practitioner
- Direct access issue

- Selected curriculum requirements from evaluative criteria for physical therapist
- Plan of care
- Social responsibility
- Career development
- Physical therapy practice patterns
- Components of a practice pattern
- Important factors that affect health.

## **THE FIVE ROLES OF THE PHYSICAL THERAPIST**

### **THE PHYSICAL THERAPIST AS PATIENT/CLIENT MANAGER**

- evaluation and diagnosis
- Diagnosis as clinical decision making
- Prognosis
- Discharge planning and discontinuance of care
- Discontinuance of care
- Outcomes
- Clinical decision making
- Referral relationships
- Interpersonal relationships
- Ethical and legal issues
- Informed consent
- Managed care and fidelity.

### **THE PHYSICAL THERAPIST AS CONSULTANT**

- Physical therapy consultation
- Building a consulting business
- The consulting process
- The skills of a good consultant
- Trust in the consultant/client relationship
- Ethical and legal issues in consultation
- Components of a consulting agreement.

### **THE PHYSICAL THERAPIST AS CRITICAL INQUIRER**

- History of critical inquiry
- Evidence-based medicine
- Outcomes research
- Whose responsibility is research?
- Roles of the staff physical therapist in critical inquiry
- Collaboration in clinical research
- Ethical and legal issues in critical inquiry.

## **THE PHYSICAL THERAPIST AS EDUCATOR**

- History of physical therapy education
- Contemporary educational roles of the physical therapist
- Teaching opportunities in continuing education
- Academic teaching opportunities
- Theories of teaching and learning in professional education
- Ethical and legal issues in physical therapy education.

## **THE PHYSICAL THERAPIST AS ADMINISTRATOR**

- History of physical therapy administration
- Contemporary physical therapy administration
- Patient/client management
- First-line management
- Midlevel managers and chief executive officers
- Leadership
- Ethical and legal issues.

## **PROFESSIONAL DEVELOPMENT, COMPETENCE, AND EXPERTISE**

- Lifelong process of skill enhancement
- The professional development continuum: from competence to expertise
- Activities that promote professional development
- Evaluation of competence and professional development
- Professional development planning
- Possible evaluators of professional achievement
- Career advancement
- Organizational impact on professional development.

## **FUTURE CHALLENGES IN PHYSICAL THERAPY**

### **PHYSICAL THERAPY'S MORAL MISSION**

- The future in three realms, individual, institutional& societal.
- Professionalism and the physical therapist.
- Practical related to the course work

### **CONSULTATION IN PHYSICAL THERAPY**

- Introduction to Consultation in Physical Therapy:
- The Way the Consultation is Carried out:
- Patient-Related Consultation:
- Client-Related Consultation:
- Consultation Activities of Physical Therapist:
- Responding to a request for a second opinion:
- Advising a referring practitioner about the indications for intervention:
- Advising employers about the requirements of the Patients/Clients with Disabilities:



- Instructing employers about pre-placement in accordance with provisions of the Patients/Clients with Disabilities:
- Educating other health practitioners (eg, in injury prevention):
- Performing environmental assessments to minimize the risk of falls:
- Conducting a program to determine the suitability of employees for specific job assignments:
- Examining school environments and recommending changes to improve accessibility for students with disabilities:
- Developing programs that evaluate the effectiveness of an intervention plan in reducing work-related injuries:
- Working with employees, labor unions, and government agencies to develop injury reduction and safety programs:
- Participating at the local, state, and federal levels in policymaking for physical therapy services:
- Providing expert legal opinion:

## **SCREENING IN PHYSICAL THERAPY**

- Introduction to Screening in Physical Therapy
- The Way the Screening is Carried Out
- The Basis of Screening
- Problem-focused, systematic collection and analysis of data to
- Identify individuals at risk in order to provide primary Prevention:
- Identify those in need of physical therapy intervention or other rehabilitative services
- Ascertain the presence of positive findings that require attention by another health care practitioner in order to provide secondary or tertiary prevention
- Candidates for Screening
- Screening Activities of Physical Therapist
  - Identifying children who may need an examination for idiopathic scoliosis
  - Identifying risk factors in the workplace
  - Pre-performance testing of individuals active in sports
  - Identifying an individual's lifestyle factors (eg, exercise, stress, weight) that may lead to increased risk for serious health problems
  - Identifying elderly individuals in a community center or nursing home who are at high risk for slipping, tripping, or falling

## **DELEGATION IN PHYSICAL THERAPY**

- Introduction to Delegation in Physical Therapy:
- Delegation Pertinent Responsibilities of Physical Therapist:
- Interpretation of record of patient referred by health care provider:
- Initial evaluation and problem identification of patient:

- Development of plan of care and goals of treatment:
- Determination of appropriate portion of treatment program to be delegated to a physical therapist's assistant:
- Delegation of treatment to be administered by physical therapist's assistant:
- Instruction to the physical therapist's assistant regarding:
  - The specific program of treatment of a patient:
  - Any precaution to be taken to protect a patient:
  - Any special problem of a patient:
  - Any procedure which should not be administered to a patient:
  - The proper methods for documenting the treatment that is administered to the patient:
  - Any other information required to treat a patient:
  - Treatment review in a timely manner:
  - Documentation of goal of treatment:
  - Revision of plan of care when indicated:
  - Revision of Documentation done by PTA during periodic reviews of the patient and make note of those reviews in the evaluation or reassessment of the patient:
  - Case management and dissemination of any written and oral reports:
  - Performance of final evaluation upon the discharge:
- When and When Not to Delegate:
  - National Perspectives:
  - International Perspectives:
- To Whom and to Whom Not to Delegate:
  - National Perspectives:
  - International Perspectives:
- Supervision of Treatment Program Delegated to a Physical Therapist's Assistant by Physical Therapist:

## **CULTURAL COMPETENCY IN PHYSICAL THERAPY**

- General Consideration of Cultural Competence in Physical Therapy
  - Cultural Competence
  - Key Concepts
- Culture
- Principles and Assumptions
- Power and Privilege
- Exploring Differences
- Equitable Access
- Racism & Oppression
  - Elements of Cultural Competence
  - National Diverse Communities

- International Diverse Communities
- Providing Health Care in a Multicultural Society
- Patient and Client Encounter Questions
- LIAASE: A General Cultural Competence Tool
- Health Professional Self-Assessment Tool
- Steps to Cultural Study and Cultural Competence
- Therapist's vs Patient's Culture
- Physical Therapist's Culture
- Understanding Patient's Culture
- Addressing Conflict
- LIAASE (Learn, Inquire, Avoid Polarization, Avoid Arguing and Defending, Show Empathy ): A General Cultural Competence Tool
- Health Professional Self-Assessment Tool

## **STANDARDS OF COMPETENCE IN PHYSICAL THERAPY**

- Need for developing standards of competence
- Assumptions behind the standards
- Why have standards not been developed for the physical therapist assistant
- Continuing competence
- How were these standards developed
- How are the standards presented
- To whom do these standards apply
- Domain 1-Professional Practice
  - Professional Accountability
  - Professional Behavior
  - Professional Development
- Domain 2-Patient/Client Management
  - Examination, Evaluation And Diagnosis
  - Plan Of Care
  - Implementation
  - Education
  - Discharge
- Cultural Heritage
- Communication in Cultural Context
- Family Roles and Organization Within Culture
- Cultural Workforce Issues
- High Risk Health Behaviors, Biocultural Ecology, and Nutrition in Light of Culture:
- Spirituality and Cultural Death Rituals
- Cultural Healthcare Practices and Roles of Healthcare Practitioners
- Selected Ethnic Cultures

- Cultural Considerations for
  - Pakistani Cultures:
  - American / Black Cultures
  - Chinese Culture
  - Latino/Hispanic Client
  - American Indian Cultures
  - Middle Eastern Cultures
  - Jewish Clients
- Culture of Various Physical Therapy Populations
  - Disability across Cultures
  - Veteran and Military Culture and Physical Therapy
  - The Challenge and Culture of Poverty and Homelessness
  - Physical Therapy Cultural Encounters in Pediatrics
  - Physical Therapy Cultural Encounters in Geriatrics
- Professional Development, Competence, and Expertise
- Lifelong process of skill enhancement
- The professional development continuum: from competence to expertise
- Activities that promote professional development
- Evaluation of competence and professional development:
- Professional development planning
- Possible evaluators of professional achievement
- Career advancement
- Organizational impact on professional development
- Future Challenges in Physical Therapy
- Physical therapy's moral mission
- The future in three realms, individual, institutional& societal
- Professionalism and the physical therapist

## **LAWS, REGULATIONS, AND POLICIES FOR PHYSICAL THERAPY**

- National Laws, Regulations, and Policies for Physical Therapy:
- International Laws, Regulations, and Policies for Physical Therapy:
  - Arab Countries' Laws, Regulations, and Policies for Physical Therapy (e.g., UAE and KSA etc):
  - European Laws, Regulations, and Policies for Physical Therapy:
  - Australian&NewZealanderLaws, Regulations, and Policies for Physical Therapy:
  - American Laws, Regulations, and Policies for Physical Therapy:
- Statutes and Regulations:
- Statutes:
- Regulations
- Creating Statutes and regulation:
- The Court System:

- Criminal versus Civil Law
- Criminal Law:
- Civil Law:
- Policies:
- The American Physical Therapy Association:
- Payer Reimbursement Policies:
- Employer Policies:
- An Overview of Laws, Regulations, and Policies of different States for Physical Therapy:
  - The roles of World Confederation for Physical Therapy (WCPT)

## **EDUCATION TECHNIQUES**

### **THE TEACHING-LEARNING PROCESS**

- Teaching Responsibilities:
- Components of the Teaching Process:
  - Analysis of the learner / assessment:
  - Analysis of data, formulation of objectives of instruction:
  - Analysis of instruction / planning:
  - Implantation:
  - Evaluation:
  - Documentation:

### **EDUCATIONAL THEORY**

- Learning Theories:
  - Behaviorist:
  - Cognitive:
  - Humanist:
  - Adult learning:
- Behavioral Objectives from the Educational Domains:
  - Cognitive:
  - Affective:
  - Psychomotor:

### **EDUCATION IN THE ACADEMIC ENVIRONMENT**

- Curriculum Design for Physical Therapy Educational Programs:
- From Curricular Goals to Instruction: Preparing to Teach:
- Teaching and Learning in Academic Settings:
- Physical Therapy Education in the Digital Age: Leveraging: Technologies to Promote Learning:
- Assessing and Improving the Teaching and Learning Process in Academic Settings:
- Authentic Assessment: Simulation-Based Education:
- Strategies for Planning and Implementing Inter-professional Education

## **EDUCATION IN PRACTICE ENVIRONMENTS**

- Preparation for Teaching in Clinical Settings:
- Techniques for Teaching in Clinical Settings:
- Qualities of a Good Clinical Teacher:
- Facilitating the Teaching and Learning of Clinical Reasoning:
- Patient Education and Health Literacy:
- Applied Behavioral Theory and Adherence: Models for
  - Practice:
- Teaching and Learning Psychomotor Skills:

## **RECOMMENDED BOOKS**

1. *Professionalism in Physical Therapy: History, Practice, & Development*, Lisa L. Dutton, PT, PhD.
2. APTA. *Guide to Physical Therapy Practice: Revised second edition*. Alexandria, VA: American Physical Therapy Association; 2003. ISBN: 978-1-887759-85.
3. *Handbook of Teaching for Physical Therapists*
4. Katherine Shepard, Gail Jensen, 2011, ISBN: 978-1-4557-3470-2

## **INTEGUMENTARY PHYSICAL THERAPY CREDIT HOURS 2(2-0)**

### **COURSE DESCRIPTION**

This course includes a study of anatomy and physiology of the Integumentary system and pathological changes of the system and function, including diagnostic tests and measurements. The use of evidence-based physical therapy intervention for Integumentary conditions is emphasized. Topics will focus on comparing contemporary, traditional interventions and the impact of evolving technology in this area. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Assess a patient's wound
3. Explain different types of wounds and their management options
4. Explain classification of burns and scar management of burns patients
5. Demonstrate documentations in SOAP format.

### **Course Learning Objectives:**

1. Explain anatomy and physiology of the integumentary system.
2. Describe pathological changes of the system and function, including the use of evidence-based physical therapy intervention for integumentary conditions
3. Explain wound assessment and pain management
4. Describe acute and chronic wound healing, wound classifications, and management strategies
5. Explain burns classifications and management strategies
6. Demonstrate seating, positioning, and support surfaces
7. Demonstrate documentation in SOAP notes format.

## **MEDICAL TERMINOLOGY REGARDING INTEGUMENTARY SYSTEM**

### **WOUND CARE CONCEPTS**

- Quality of Life and Ethical Issues
- Regulation and wound Care
- Skin, an Essential Organ
- Acute and Chronic Wound Healing
- Wound assessment
- Wound Bioburden
- Wound Debridement
- Wound Treatment Options
- Nutrition and wound care
- Seating, Positioning and support surfaces
- Pain Management and wounds.

## **WOUND CLASSIFICATIONS AND MANAGEMENT STRATEGIES**

- Pressure Ulcers
- Vascular Ulcers
- Diabetic Foot Ulcers
- Sickle Cell Ulcers
- Wounds in special Populations
- Complex wounds
- Atypical Wounds
- Wound Care; where we were, where we are, and where we are going

## **BURNS**

- Skin and appendage
- Classification of burns
- Types of burns
- Criteria of care in burn center
- Physical therapy in different phases of burns

## **CASE HISTORIES**

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based integumentary Physical Therapy Treatment protocols.

## **RECOMMENDED BOOKS**

1. Wound Care Essentials, practice principles, By Sharon Baranoski& Elizabeth A. Ayello.
2. APTA. *Guide to Physical Therapy Practice: Revised second edition*. Alexandria, VA: American Physical Therapy Association; 2003. ISBN: 978-1-887759-85.



**SUPERVISED CLINICAL PRACTICE – V      CREDIT HOURS   3(0-3)****CARDIOVASCULAR AND PULMONARY**

<b>SEMESTER</b>	<b>SUPERVISION</b>	<b>FOCUS</b>	<b>WARDS</b>	<b>COMPETENCIES</b>
9	Supervised by trained PT	Evaluation, Examination, and Intervention	Cardiovascular and pulmonary (IPD/OPD; surgical & nonsurgical)	Listed below

**COURSE DESCRIPTION**

During this supervised clinical practice, students are responsible for successful execution of examination, evaluation, and interventions relating to cardiovascular and pulmonary disorders. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, pediatric and geriatric,) Students learn to objectively perform these skills under the supervision of trained physical therapists. Student is required to keep a performance record of all listed competencies and successfully perform on real patients during the final evaluation of the course

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Execute examination, evaluation and interventions relating to cardiovascular and pulmonary disorders
3. Performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, pediatric and geriatric)
4. Learn to objectively perform these skills under the supervision of trained physical therapists
5. Making a record of all listed competencies and successfully perform these on real patients during the final evaluation of the course.

**Course learning Objectives:**

1. Design the best available evidence for selected examination tests and measures that are appropriate for the patient/client
2. Perform cardiovascular/pulmonary tests and measures including, heart rate, respiratory rate, pattern and quality blood pressure, Aerobic capacity test\* (functional or standardized) such as the 6-minute walk test, pulse oximetry, breath sounds – normal/abnormal, response to exercise (RPE),

signs and symptoms of hypoxia, peripheral circulation (deep vein thrombosis, pulse, venous stasis, lymphedema)

3. Synthesize available data on a patient/client expressed in terms of the International Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation
4. Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (i.e, practice patterns in the guide)
5. Determine the predicted level of optimal functioning and the amount of time required to achieve that level
6. Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame
7. Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes
8. Consult patient/client and/or caregivers to develop a mutually agreed upon plan of care
9. Identify patient/client goals and expectations
10. Identify indications for consultation with other professionals
11. Make referral to resources needed by the patient/client (assumes knowledge of referral sources) - select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care
12. Establish criteria for discharge based on patient goals and current functioning and disability
13. Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with re-evaluation
14. Prepare needed resources for the patient/client to ensure timely discharge, including follow-up care including patient/client and family/caregiver as a partner in discharge.

### **CLINICAL COMPETENCIES EXAMINATION**

- Based on best available evidence select examination tests and measures that are appropriate for the patient/client
- Perform posture tests and measures of postural alignment and positioning.
- Perform gait, locomotion and balance tests including quantitative and qualitative measures such as:
- Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment

- Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
- Gait and locomotion during functional activities with or without the
- Use of assistive, adaptive, orthotic, protective, supportive, or
- prosthetic devices or equipment to include:
- Bed mobility
- Transfers (level surfaces and floor)
- Wheelchair management
- Uneven surfaces
- Safety during gait, locomotion, and balance
- Perform gait assessment including step length, speed, characteristics of gait, and abnormal gait patterns.
- Characterize or quantify body mechanics during self-care, home management, work, community, tasks, or leisure activities.
- Characterize or quantify ergonomic performance during work (job/school/play):
- Dexterity and coordination during work
- Safety in work environment
- Specific work conditions or activities
- Tools, devices, equipment, and workstations related to work actions, tasks, or activities
- Characterize or quantify environmental home and work (job/school/play) barriers:
- Current and potential barriers
- Physical space and environment
- Community access
- Observe self-care and home management (including ADL and IADL)
- Measure and characterize pain to include:
- Pain, soreness, and nociception
- Specific body parts
- Recognize and characterize signs and symptoms of inflammation.
- Perform cardiovascular/pulmonary tests and measures including:
- Heart rate
- Respiratory rate, pattern and quality
- Blood pressure
- Aerobic capacity test\* (functional or standardized) such as the 6-minute walk test
- Pulse Oximetry
- Breath sounds – normal/abnormal

- Response to exercise (RPE)
- Signs and symptoms of hypoxia
- Peripheral circulation (deep vein thrombosis, pulse, venous stasis, lymphedema).

## **EVALUATION**

- Clinical reasoning
- Clinical decision making
- Synthesize available data on a patient/client expressed in terms of the International Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation.
- Use available evidence in interpreting the examination findings.
- Verbalize possible alternatives when interpreting the examination findings.
- Cite the evidence (patient/client history, lab diagnostics, tests and measures and scientific literature) to support a clinical decision

## **DIAGNOSIS**

- Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (ie, practice patterns in the Guide)
- Identify and prioritize impairments in body functions and structures, and activity limitations and participation restrictions to determine specific body function and structure, and activities and participation towards which the intervention will be directed.

## **PROGNOSIS**

- Determine the predicted level of optimal functioning and the amount of time required to achieve that level.
- Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame including
- Age
- Medication(s)
- Socioeconomic status
- Co-morbidities
- Cognitive status
- Nutrition
- Social Support
- Environment.

## **PLAN OF CARE**

- Goal setting
- Coordination of Care

- Progression of care
- Discharge
- Design a Plan of Care
- Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes
- Consult patient/client and/or caregivers to develop a mutually agreed to plan of care.
- Identify patient/client goals and expectations
- Identify indications for consultation with other professionals
- Make referral to resources needed by the patient/client (assumes knowledge of referral sources)
- Select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care (ie, (a) identify precautions and contraindications, (b) provide evidence for patient-centered interventions that are identified and selected, (c) define the specificity of the intervention (time, intensity, duration, and frequency), and (d) set realistic priorities that consider relative time duration in conjunction with family, caregivers, and other health care professionals)
- Establish criteria for discharge based on patient goals and current functioning and disability
- Coordination of Care
- Identify who needs to collaborate in the plan of care.
- Identify additional patient/client needs that are beyond the scope of physical therapist practice, level of experience and expertise, and warrant referral.
- Refer and discuss coordination of care with other health care professionals.
- Articulate a specific rationale for a referral.
- Advocate for patient/client access to services.
- Progression of Care
- Identify outcome measures of progress relative to when to progress the patient further.
- Measure patient/client response to intervention.
- Monitor patient/client response to intervention.
- Modify elements of the plan of care and goals in response to changing patient/client status, as needed
- Make on-going adjustments to interventions according to outcomes including environmental factors and personal factors and, medical therapeutic interventions.
- Make accurate decisions regarding intensity and frequency when adjusting interventions in the plan of care.

- Discharge Plan
- Re-examine patient/client if not meeting established criteria for discharge based on the plan of care.
- Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with re-evaluation.
- Prepare needed resources for patient/client to ensure timely discharge, including follow-up care
- Include patient/client and family/caregiver as a partner in discharge
- Discontinue care when services are no longer indicated.
- When services are still needed, seek resources and/or consult with others to identify alternative resources that may be available.
- Determine the need for equipment and initiate requests to obtain.

## **INTERVENTIONS**

- Safety, Emergency Care, CPR and First Aid
- Standard Precautions
- Body Mechanics and
- Positioning
- Categories of Interventions
  - Safety, Cardiopulmonary Resuscitation Emergency Care, First Aid
- Ensure patient safety and safe application of patient/client care.
- Perform first aid.
- Perform emergency procedures.
- Perform Cardiopulmonary Resuscitation (CPR).
- Precautions
- Demonstrate appropriate sequencing of events related to universal precautions.
- Use Universal Precautions.
- Determine equipment to be used and assemble all sterile and non-sterile materials.
- Use transmission-based precautions.
- Demonstrate aseptic techniques.
- Apply sterile procedures
- Properly discard soiled items
- Body Mechanics and Positioning
- Apply proper body mechanics (utilize, teach, reinforce, and observe)
- Properly position, drape, and stabilize a patient/client when providing physical therapy

- Coordination, communication, and documentation may include:  
Addressing required functions:
- Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services.
- Discern the need to perform mandatory communication and reporting (eg, incident reports, patient advocacy and abuse reporting).
- Follow advance directives.
- Admission and discharge planning.
- Case management.
- Collaboration and coordination with agencies, including:
  - Home care agencies
  - Equipment suppliers
  - Schools
  - Transportation agencies
  - Payer groups
- Communication across settings, including:
  - Case conferences
  - Documentation
  - Education plans
  - Cost-effective resource utilization.
  - Data collection, analysis, and reporting of:
    - Outcome data
    - Peer review findings
    - Record reviews
- Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including:
  - Elements of examination, evaluation, diagnosis, prognosis, and Intervention
  - Changes in body structure and function, activities and participation
  - Changes in interventions
  - Outcomes of intervention
    - Interdisciplinary teamwork
    - Patient/client family meetings
    - Patient care rounds
    - Case conferences
- Referrals to other professionals or resources.
- Patient/client-related instruction may include:
  - Instruction, education, and training of patients/clients and caregivers regarding:

- Current condition, health condition, impairments in body structure and function, and activity limitations, and participation restrictions)
- Enhancement of performance
- Plan of care:
- Risk factors for health condition, impairments in body structure and function, and activity limitations, and participation restrictions.
- Preferred interventions, alternative interventions, and alternative modes of delivery
- Expected outcomes
- Health, wellness, and fitness programs (management of risk factors)
- Transitions across settings.

### **THERAPEUTIC EXERCISE MAY INCLUDE PERFORMING**

#### **Aerobic capacity/endurance conditioning or reconditioning**

- Gait and locomotor training
- Increased workload over time (modify workload progression)
- Movement efficiency and energy conservation training
- Walking and wheelchair propulsion programs
- Cardiovascular conditioning programs

#### **RELAXATION**

- Breathing strategies
- Movement strategies
- Relaxation techniques
- C. Airway clearance techniques may include
  - Breathing strategies
- Active cycle of breathing or forced expiratory techniques
- Assisted cough/huff techniques
- Paced breathing
- Pursed lip breathing
- Techniques to maximize ventilation (e.g., maximum inspiratory hold, breath stacking, manual hyperinflation)
- Manual/mechanical techniques
- Assistive devices.
- Positioning
- Positioning to alter work of breathing
- Positioning to maximize ventilation and perfusion.
- Functional training in self-care and home management may include
- Functional training in work (job/school/play), community, and leisure integration or reintegration may include
- Activities of daily living (ADL) training



- Bed mobility and transfer training
- Age appropriate functional skills
  - Barrier accommodations or modifications
  - Device and equipment use and training:
- Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)
- Orthotic, protective, or supportive device or equipment training during self-care and home management
- Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)
- Functional training programs
- Simulated environments and tasks
- Task adaptation
- Injury prevention or reduction
  - Safety awareness training during self-care management
  - Injury prevention education during self-care management
  - Injury prevention or reduction with use of equipment
- Prescription, application, and, as appropriate, fabrication of devices and equipment may include
  - Adaptive devices
  - Hospital beds
  - Raised toilet seats
  - Seating systems – prefabricated
  - Assistive devices
  - Canes
  - Crutches
  - Long-handled reachers
  - Static and dynamic splints – prefabricated
  - Walkers
  - Wheelchairs
  - Orthotic devices
  - Prefabricated braces
  - Prefabricated shoe inserts
  - Prefabricated splints.
  - Prosthetic devices (lower-extremity)
  - Protective devices
  - Braces
  - Cushions
  - Helmets

- Protective taping
- Supportive devices
- Prefabricated compression garments
- Corsets
- Elastic wraps
- Neck collars
- Slings
- Supplemental oxygen - apply and adjust
- Supportive taping
- Electrotherapeutic modalities may include
- Biofeedback
- Electrotherapeutic delivery of medications (eg, iontophoresis)
- Electrical stimulation
- Electrical muscle stimulation (EMS)
- Functional electrical stimulation (FES)
- High voltage pulsed current (HVPC)
- Neuromuscular electrical stimulation (NMES)
- Transcutaneous electrical nerve stimulation (TENS)
- Physical agents and mechanical modalities may include: *Physical agents:*
- Cryotherapy
- Cold packs
- Ice massage
- Vapocoolant spray
- Hydrotherapy
- Contrast bath
- Pools
- Whirlpool tanks
- Sound agents
- Phonophoresis
- Ultrasound
- Thermotherapy
- Dry heat
  - Hot packs
  - Paraffin baths

## **MECHANICAL MODALITIES**

- Compression therapies (prefabricated)
- Compression garments
- Skill Category Description of Minimum Skills
- Vaso pneumatic compression devices
- Taping

- Compression bandaging (excluding lymphedema)
- Gravity-assisted compression devices
- Standing frame
- Tilt table
- Mechanical motion devices
  - Continuous passive motion (CPM)
- Traction devices
- Intermittent
- Positional
- Sustained
- Documentation of all listed competency in SOAP notes format

### **Note**

It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical logbook duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

## TENTH SEMESTER

Sr.No.	Course Title	Credit Hours
01	OBSTETRICS & GYNAECOLOGICAL PHYSICAL THERAPY	2(2-0)
02	PAEDIATRIC PHYSICAL THERAPY	2(2-0)
03	GERONTOLOGY & GERIATRIC PHYSICAL THERAPY	2(2-0)
04	SPORTS PHYSICAL THERAPY	2(2-0)
05	SUPERVISED CLINICAL PRACTICE VI (Practical)	4(0-4)
06	RESEARCH PROJECT	6
<b>Total Credit Hours in Semester-10</b>		<b>18</b>

## **OBSTETRICS & GYNEACOLOGICAL PHYSICAL THERAPY**

### **CREDIT HOURS 2(2-0)**

#### **COURSE DESCRIPTION**

This course intends to provide Introduction to physical therapy practice for evaluation and treatment of pelvic floor dysfunction, pregnancy, osteoporosis, and other disorders specific to women. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

## **OBSTETRICS AND GYNAECOLOGICAL PHYSICAL THERAPY:**

### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Discuss common gynecological conditions relevant to physical therapy
3. Evaluate the woman's health problems
4. Discuss rehabilitation plan for gynecological patients

### **Course Learning Objectives:**

1. Understand the anatomy of the female reproductive system
2. Understand the physiology of these reproductive organs
3. Understand the pathological conditions associated with female reproductive system.
4. Describe management of oncological conditions.
5. Understand women's health and its associated medical conditions
6. Understand the demands of female athletes with the active role of exercise
7. Understand the effects of aquatic therapy on women of every age.
8. Understand the long-term disabilities with its role in physical therapy
9. Assessment and management protocols in specific gynecological conditions
10. Explain the latest and advances and research in women's health
11. Demonstrate evidence-based practice in different obstetrical and gynecological conditions.

## **COURSE CONTENTS**

### **MEDICAL TERMINOLOGY REGARDING GYNECOLOGY, OBSTETRICS AND WOMEN'S HEALTH**

- Anatomy
- Physiology of pregnancy
- Physical and physiological changes of labour and the puerperium
- The antenatal period
- Relieving the discomforts of pregnancy
- Preparation of labor
- Postnatal period
- The climacteric

- Common gynecological conditions
- Gynecological surgery
- Urinary function and dysfunction
- Bowel and anorectal function and dysfunction.

### **ONCOLOGICAL ISSUE WITH WOMEN'S HEALTH**

- Management of breast cancer
- Management of lymph odema.

### **SPECIAL TOPIC IN WOMEN'S HEALTH**

- Female athletes
- Exercise issues and aging
- Aquatic therapy services in women health
- Physical therapy management for women with long term physical disabilities.

### **CASE HISTORIES**

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based obstetrics and gynecological Physical Therapy Treatment protocols.

### **RECOMMENDED BOOKS**

1. Physiotherapy in Obstetrics and Gynecology By: Jill Mantle, Jeanette Haslam, Sue Barton, 2<sup>nd</sup> edition.
2. Textbook of Physiotherapy for Obstetric and Gynecological Conditions (Paperback) By (author) G.B. Madhur.

## **PEDIATRIC PHYSICAL THERAPY**

**CREDIT HOURS 2 (2-0)**

### **COURSE DESCRIPTION**

- This course addresses both the medical and rehabilitation management of the pediatric patients using an interdisciplinary approach. The etiology and clinical features of common diseases/ disorders observed in the pediatric population will be emphasized. Students will participate in case studies and an interdisciplinary evaluation project.

### **LEARNING OBJECTIVES:**

- Discuss common Pediatric conditions relevant to physical Therapy
- Evaluate the pediatric problems
- Formulate effective rehabilitation plan for pediatric patients.

### **COURSE CONTENTS**

#### **MEDICAL TERMINOLOGY REGARDING PEDIATRICS**

- History and Examination / Pediatric Examination
- Assessment and outcome measurement
- Theories of Development
- Medical Care of Children with Disabilities
- Psychological Assessment in Pediatric Rehabilitation
- Approaches to working with children
- Normal Developmental Milestones
- Language Development in Disorders of Communication and Oral Motor Function Adaptive Sports and Recreation
- Orthotic and Assistive Devices
- Electro diagnosis in Pediatrics
- Motor Learning & Principles of Motor Learning
- The Child Parents and Physiotherapist
- Aging With Pediatric Onset Disability and Diseases
- The Assessment of Human Gait, Motion, and Motor Function
- Psychosocial Aspects of Pediatric Rehabilitation
- Pediatric and Neonatal Intensive Therapy
- Disorders of Respiratory System
- Cystic Fibrosis Duchenne Muscular
- Hemophilia
- Lower Limb Deformities
- Orthopedics and Musculoskeletal Conditions
- Talipes Equino Varus
- Torticollis
- Pediatric Limb Deficiencies
- Neuromuscular Diseases
- Myopathies

- Traumatic Brain Injury
- Cerebral Palsy
- Spinal Cord Injuries
- Spina Bifida
- Oncology and palliative care.

### **CASE HISTORIES**

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based pediatric Physical Therapy Treatment protocols

### **RECOMMENDED BOOKS**

1. *Physical Therapy for Children* By, Suzann K. Campbell, Robert J. Palisano&Darl W. Vander Linden.
2. *Paediatric Rehabilitation Principles and practice* (Fourth Edition) By, Michael A Alexander & Dennis j. Matthews.
3. *Additional reading material as assigned.*



## **GERONTOLOGY & GERIATRIC PHYSICAL THERAPY**

### **CREDIT HOURS 2 (2-0)**

#### **COURSE DESCRIPTION**

The course covers normal aging process, physiological and psychological changes and their effects on daily living activities (ADL) and instrumental daily living activities (IADL). Relevant tests and measures for determining impairment and differentiating the diagnosis based on the specificity and sensitivity of the assessment instruments as related to patients with geriatric conditions are discussed. The use of evidence-based physical therapy intervention for geriatric conditions is emphasized. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

#### **Course Outcomes:**

1. At the end of the semester students should be able to
2. Discuss common gynecological conditions relevant to physical therapy
3. Evaluate the woman's health problems
4. Discuss rehabilitation plan for gynecological patients

#### **Course Learning Objectives:**

1. Understand the anatomy of the female reproductive system
2. Understand the physiology of these reproductive organs
3. Understand the pathological conditions associated with female reproductive system.
4. Describe management of oncological conditions.
5. Understand women's health and its associated medical conditions
6. Understand the demands of female athletes with the active role of exercise
7. Understand the effects of aquatic therapy on women of every age.
8. Understand the long-term disabilities with its role in physical therapy
9. Assessment and management protocols in specific gynecological conditions
10. Explain the latest and advances and research in women's health
11. Demonstrate evidence-based practice in different obstetrical and gynecological conditions

## **COURSE CONTENTS**

### **GERONTOLOGY**

- Introduction to Gerontology
- Demographic Trends of an Aging Society
- Social Gerontology
- The Physiology and Pathology of Aging
- The Cognitive and Psychological Changes Associated with Aging
- Functional Performance in Later Life: Basic Sensory, Perceptual, and Physical Changes Associated with Aging

- Geriatric Pharmacotherapy
- Sexuality and Aging
- Living Options and the Continuum of Care
- Legal and Financial Issues Related to Health Care for Older People
- Health Care Providers Working With Older Adults
- Future Concerns in an Aging Society
- Health Literacy and Clear Health Communication

## **GERIATRIC PHYSICAL THERAPY**

### **MEDICAL TERMINOLOGY REGARDING GERIATRICS ATTITUDES AND AGEISM**

- Ageism
- Myths and Facts about Older Adults
- Age Bias in Healthcare
- Geriatric Training and Role of Physical Therapist

### **NORMAL PHYSICAL CHANGES IN OLDER ADULTS**

- Breathing — the Respiratory System
- Beating — the Cardiovascular System
- Thinking and Reacting — the Nervous System
- Moving — the Musculoskeletal System
- Eating & Eliminating — the Gastrointestinal and Urinary Systems
- Metabolizing — the Endocrine System
- Responding — the Sensory System
- Sleeping and Other Physical Changes

### **PSYCHOLOGICAL CHANGES**

- The 3 Ds and Suicide in Older Adults
- Delirium
- Dementia
- Depression

### **OLDER ADULT ABUSE AND NEGLECT**

- Scope of Older Adult Abuse and Neglect
- Clues to Abuse and Interventions

### **TRIAGE AND ASSESSMENT**

- ABCs of Geriatric Assessment
- Assessment Techniques and Atypical Presentations

### **PAIN**

- Pain in Older Adults
- Pain Assessment and Challenges
- Impact of Physiological Changes
- Medication and Pain Management
- Medication Interactions

- Medication and Food

## **EFFECTS OF AGE**

- Task Complexity,
- Exercise
- Ambulation.

## **PHYSICAL THERAPY FOR GERIATRICS IN VARIOUS NEUROMUSCULAR DISORDERS**

- Alzheimer's disease
- Parkinsonism
- Cerebrovascular accident (C.V.A)
- Poly neuropathies etc.

## **PRE-OPERATIVE AND POST OPERATIVE PHYSICAL THERAPY FOR GERIATRICS IN VARIOUS MUSCULOSKELETAL DISORDERS**

- Hip & Knee Joint replacements
- Soft tissue injuries.

## **BALANCE AND FALL IN ELDERLY: ISSUES IN EVALUATION AND TREATMENT**

- Introduction
- Defining the problem of falls, risk factors, aging theory concept pertinent to falls in the elderly
- Multi-faceted approach to the falls problem
- Postural control theory, physiology of balance ,
- Summary influence of age on postural control, relationship between postural control and falls, A model, examination and evaluation, history, biological assessment, sensory effectors, strength, ROM, endurance, central processing, functional assessment, environmental assessment, psychosocial assessment, intervention

## **MEDICATIONS**

### **NUTRITIONAL DEFICIENCIES**

- Primary nutritional problems, limited fixed incomes, severely limited food choices and availability.

### **CASE HISTORIES**

- Principles of assessment and outcome measures.
- Documentation in SOAP notes format.
- Evidence based geriatric Physical Therapy Treatment protocols.

### **RECOMMENDED BOOKS**

1. *Geriatric Physical Therapy* by Andrew A. Guccione.
2. *Fundamentals of Geriatric Medicine.*
3. *Gerontology for health care professional* by regala H robbnet/ walter.
4. *Handbook of gerontology* by James A Blackburn and Catherine N Dulmus.

**SPORTS PHYSICAL THERAPY**  
**COURSE DESCRIPTION****CREDIT HOURS 2 (2-0)**

The main focus of this course is related to the understanding of the role that physical therapists play in both the industrial continuum and sports physical therapy. Emphasis is placed on acute management of traumatic injuries and/or sudden illness. In addition, injury prevention with an emphasis on the advanced clinical competencies related to the practice of sports physical therapy will also be covered.

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Discuss common pediatric conditions relevant to physical therapy
3. Evaluate pediatric problems
4. Formulate an effective rehabilitation plan for pediatric patients

**Course Learning Objectives:**

1. Demonstrate medical and rehabilitation management of pediatric patients using an interdisciplinary approach
2. Discuss the etiology of common diseases/disorders observed in the pediatric population
3. Discuss clinical features of common diseases/disorders observed in the pediatric population
4. Participation in case studies
5. Design a rehabilitation plan based on current evidence
6. Examination, evaluation and comparing contemporary traditional interventions
7. 7. Discuss the impact of evolving technology in pediatric rehabilitation

**COURSE CONTENTS****MEDICAL TERMINOLOGY RELATED TO SPORTS PHYSICAL THERAPY****INTRODUCTION TO SPORTS REHABILITATION**

- Introduction to sport injury management.

**INJURY SCREENING AND ASSESSMENT OF PERFORMANCE**

- Injury prevention and screening
- Assessment and needs analysis.

**PATHOPHYSIOLOGY OF MUSCULOSKELETAL INJURIES**

- Pathophysiology of skeletal muscle injuries
- Pathophysiology of tendon injuries
- Pathophysiology of ligament injuries
- Pathophysiology of skeletal injuries

- Peripheral nerve injuries.

## **EFFECTIVE CLINICAL DECISION MAKING**

- An introduction to periodisation
- Management of acute sport injury
- Musculoskeletal assessment
- Progressive systematic functional rehabilitation
- Strength and conditioning
- Nutritional considerations for performance and rehabilitation
- Psychology and sports rehabilitation
- Clinical reasoning.

## **JOINT SPECIFIC SPORT INJURIES AND PATHOLOGIES**

- Shoulder injuries in sport
- The elbow
- Wrist and hand injuries in sport
- The groin in sport
- The knee
- Ankle complex injuries in sport
- The foot in sport.

## **TRAVELING WITH A TEAM DRUGS AND THE ATHLETE ETHICS AND SPORTS MEDICINE CASE HISTORIES**

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based sports Physical Therapy Treatment protocols.

## **RECOMMENDED BOOKS**

1. *Sports Rehabilitation and Injury Prevention* by: Paul Comfort & Earle Abrahamson, 1<sup>st</sup> Edition, 2010, Wiley Blackwell Publishers.
2. *Clinical Sports Medicine* by: Brukner & Khan, 4ed, McGraw-Hill Publishers.
3. *A guide to sports and injury management* by: Mike Bundy & Andy Leaver, 1<sup>st</sup> edition, 2010, Churchill Livingstone

**SUPERVISED CLINICAL PRACTICE-VI****CREDIT HOURS 4 (0-4)**

<b>SEMESTER</b>	<b>SUPERVISION</b>	<b>FOCUS</b>	<b>WARDS</b>	<b>COMPETENCIES</b>
10	Supervised by trained PT	Evaluation, Examination, and Intervention	Integumentary, gynecology& obstetrics, Geriatric, sports and metabolic disorders (IPD/OPD; surgical & non-surgical)	Listed below

**COURSE DESCRIPTION**

During this supervised clinical practice, students are responsible for successful execution of examination, evaluation, and interventions relating to Integumentary, gynecology and obstetrics, sports and metabolic disorders. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, nonsurgical, pediatric, geriatric, obstetrics & gynecology, sports etc.) Students learn to objectively perform these skills under the supervision of trained physical therapists. Student is required to keep a performance record of all listed competencies and successfully perform on real patients during the final evaluation of the course.

**Course Outcomes:**

1. At the end of the semester students should be able to
2. Examine interventions relating to integumentary, pediatrics, gynecology and obstetrics, sports and metabolic disorders
3. Evaluate interventions relating to integumentary, pediatrics, gynecology and obstetrics, sports and metabolic disorders
4. Demonstrate treatment in all settings (inpatient and outpatient) under the supervision of a trained physical therapist
5. Demonstrate the documentation of all listed competencies in SOAP notes format

**Course Learning Objectives:**

1. Examination related to the integumentary system
2. Examination related to paediatrics
3. Examination related to gynecology and obstetrics
4. Examination related to sports and metabolic disorders
5. Evaluation related to the integumentary system

6. Evaluation related to paediatrics
7. Evaluation related to gynecology and obstetrics
8. Evaluation related to sports and metabolic disorders
9. Demonstration of skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, paediatric, geriatric, obstetrics and gynecology, sports etc.)
10. Objectively perform these skills under the supervision of trained physical therapists
11. Performance record of all listed competencies and successfully performing them on real patients

### **CLINICAL COMPETENCIES and EXAMINATION**

1. Based on best available evidence select examination tests and measures that are appropriate for the patient/client.
  2. Perform posture tests and measures of postural alignment and positioning.
  3. Perform gait, locomotion and balance tests including quantitative and qualitative measures such as;
  4. Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
  5. Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
  6. Gait and locomotion during functional activities with or without the
  7. use of assistive, adaptive, orthotic, protective, supportive, or
  8. prosthetic devices or equipment to include:
  9. Bed mobility
    - a. Transfers (level surfaces and floor)
    - b. Wheelchair management
    - c. Uneven surfaces
    - d. Safety during gait, locomotion, and balance
- Perform gait assessment including step length, speed, characteristics of gait, and abnormal gait patterns.
  - Characterize or quantify body mechanics during self-care, home management, work, community, tasks, or leisure activities.
  - Characterize or quantify ergonomic performance during work (job/school/play)
  - Dexterity and coordination during work
  - Safety in work environment
  - Specific work conditions or activities
  - Tools, devices, equipment, and workstations related to work actions, tasks, or activities

- Characterize or quantify environmental home and work (job/school/play) barriers:
- Current and potential barriers
- Physical space and environment
- Community access
- Observe self-care and home management (including ADL and IADL)
- Measure and characterize pain\* to include
- Pain, soreness, and nociception
- Specific body parts
- Recognize and characterize signs and symptoms of inflammation.
- Perform integumentary integrity tests and measures including
- Activities, positioning, and postures that produce or relieve trauma to the skin.
- Assistive, adaptive, orthotic, protective, supportive, or prosthetic devices and equipment that may produce or relieve trauma to the skin.
- Skin characteristics, including blistering, continuity of skin color, dermatitis, hair growth, mobility, nail growth, sensation, temperature, texture and turgor.
- Activities, positioning, and postures that aggravate the wound or scar or that produce or relieve trauma.
- Signs of infection.
- Wound characteristics: bleeding, depth, drainage, location, odor, size, and color.
- G. Wound scar tissue characteristics including banding, pliability, sensation, and texture.

## **EVALUATION**

- Clinical reasoning
- Clinical decision making
- Synthesize available data on a patient/client expressed in terms of the International Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation.
- Use available evidence in interpreting the examination findings.
- Verbalize possible alternatives when interpreting the examination findings.
- Cite the evidence (patient/client history, lab diagnostics, tests and measures and scientific literature) to support a clinical decision.

## **DIAGNOSIS**

- Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (ie, practice patterns in the Guide)



- Identify and prioritize impairments in body functions and structures, and activity limitations and participation restrictions to determine specific body function and structure, and activities and participation towards which the intervention will be directed.

## **PROGNOSIS**

- Determine the predicted level of optimal functioning and the amount of time required to achieve that level
- Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame including
  - Age
  - Medication(s)
  - Socioeconomic status
  - Co-morbidities
  - Cognitive status
  - Nutrition
  - Social Support
  - Environment.

## **PLAN OF CARE**

- Goal setting
- Coordination of Care
- Progression of care
- Discharge
- Design a Plan of Care
- Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes.
- Consult patient/client and/or caregivers to develop a mutually agreed to plan of care.
- Identify patient/client goals and expectations.
- Identify indications for consultation with other professionals
- Make referral to resources needed by the patient/client (assumes knowledge of referral sources)
- Select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care (ie, (a) identify precautions and contraindications, (b) provide evidence for patient-centered interventions that are identified and selected, (c) define the specificity of the intervention (time, intensity, duration, and frequency), and (d) set realistic priorities that consider relative time duration in conjunction with family, caregivers, and other health care professionals).
- Establish criteria for discharge based on patient goals and current functioning and disability
- Coordination of Care

- Identify who needs to collaborate in the plan of care.
- Identify additional patient/client needs that are beyond the scope of physical therapist practice, level of experience and expertise, and warrant referral
- Refer and discuss coordination of care with other health care professionals
- Articulate a specific rationale for a referral.
- Advocate for patient/client access to services. □ Progression of Care
- Identify outcome measures of progress relative to when to progress the patient further
- Measure patient/client response to intervention
- Monitor patient/client response to intervention.
- Modify elements of the plan of care and goals in response to changing patient/client status, as needed
- Make on-going adjustments to interventions according to outcomes including environmental factors and personal factors and, medical therapeutic interventions.
- Make accurate decisions regarding intensity and frequency when adjusting interventions in the plan of care.
- **Discharge Plan**
- Re-examine patient/client if not meeting established criteria for discharge based on the plan of care.
- Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with reevaluation.
- Prepare needed resources for patient/client to ensure timely discharge, including follow-up care.
- Include patient/client and family/caregiver as a partner in discharge
- Discontinue care when services are no longer indicated.
- When services are still needed, seek resources and/or consult with others to identify alternative resources that may be available.
- Determine the need for equipment and initiate requests to obtain.

## **INTERVENTIONS**

- Safety, Emergency Care, CPR and First Aid
- Standard Precautions
- Body Mechanics and
- Positioning
- Categories of Interventions
- Safety, Cardiopulmonary Resuscitation Emergency Care, First Aid
- Ensure patient safety and safe application of patient/client care.
- Perform first aid

- Perform emergency procedures
- Perform Cardiopulmonary Resuscitation (CPR)
- Precautions
- Demonstrate appropriate sequencing of events related to universal precautions
- Use Universal Precautions.
- Determine equipment to be used and assemble all sterile and non-sterile materials
- Use transmission-based precautions.
- Demonstrate aseptic techniques
- Apply sterile procedures.
- Properly discard soiled items.
- Body Mechanics and Positioning
- Apply proper body mechanics (utilize, teach, reinforce, and observe)
- Properly position, drape, and stabilize a patient/client when providing physical therapy
- Interventions
- Coordination, communication, and documentation may include:
  - Addressing required functions:
- Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services
- Discern the need to perform mandatory communication and reporting (eg, incident reports, patient advocacy and abuse reporting).
- Follow advance directives.
- Admission and discharge planning.
- Case management.
- Collaboration and coordination with agencies, including:
  - Home care agencies
  - Equipment suppliers
  - Schools
  - Transportation agencies
  - Payer groups
- Communication across settings, including:
  - Case conferences
  - Documentation
  - Education plans
  - Cost-effective resource utilization.
  - Data collection, analysis, and reporting of:
  - Outcome data

- Peer review findings
- Record reviews
- Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including:
  - Elements of examination, evaluation, diagnosis, prognosis, and Intervention
  - Changes in body structure and function, activities and participation.
  - Changes in interventions
  - Outcomes of intervention
  - Interdisciplinary teamwork:
  - Patient/client family meetings
  - Patient care rounds
  - Case conferences
  - Referrals to other professionals or resources.
  - Patient/client-related instruction may include:
    - Instruction, education, and training of patients/clients and caregivers regarding:
      - Current condition, health condition, impairments in body structure and function, and activity limitations, and participation restrictions)
      - Enhancement of performance
      - Plan of care:
      - Risk factors for health condition, impairments in body structure and function, and activity limitations, and participation restrictions.
    - Preferred interventions, alternative interventions, and alternative modes of delivery
  - Expected outcomes
    - Health, wellness, and fitness programs (management of risk factors)
    - Transitions across settings

#### **THERAPEUTIC EXERCISE MAY INCLUDE PERFORMING**

- Integumentary repair and protection techniques may include
  - Debridement-nonselective
  - Enzymatic debridement
  - Wet dressings
  - Wet-to-dry dressings
  - Wet-to-moist dressings
  - Dressings
  - Hydrogels
  - Wound coverings
  - Topical agents
  - Cleansers

- Creams
- Moisturizers
- Ointments
- Sealants
- Functional training in self-care and home management may include\*:
- Functional training in work (job/school/play), community, and leisure integration or reintegration may include\*:
- Activities of daily living (ADL) training:
- Bed mobility and transfer training\*
- Age appropriate functional skills
- Barrier accommodations or modifications
- Device and equipment use and training:
- Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)
- Orthotic, protective, or supportive device or equipment training during self-care and home management
- Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)
- Functional training programs
- Simulated environments and tasks
- Task adaptation
- Injury prevention or reduction:
- Safety awareness training during self-care and home management
- Injury prevention education during self-care and home management
- Injury prevention or reduction with use of devices and equipment
- Prescription, application, and, as appropriate, fabrication of devices and equipment may include
- Adaptive devices
- Hospital beds
- Raised toilet seats
- Seating systems – prefabricated
- Assistive devices\*:
- Canes
- Crutches
- Long-handled reachers
- Static and dynamic splints – prefabricated
- Walkers
- Wheelchairs
- Orthotic devices

- Prefabricated braces
- Prefabricated shoe inserts
- Prefabricated splints
- Prosthetic devices (lower-extremity)
- Protective devices
- Braces
- Cushions
- Helmets
- Protective taping
- Supportive devices
- Prefabricated compression garments
- Corsets
- Elastic wraps
- Neck collars
- Slings
- Supplemental oxygen - apply and adjust
- Supportive taping
- Electrotherapeutic modalities may include:
- Biofeedback
- Electrotherapeutic delivery of medications (eg, iontophoresis)
- Electrical stimulation
- Electrical muscle stimulation (EMS)
- Functional electrical stimulation (FES)
- High voltage pulsed current (HVPC)
- Neuromuscular electrical stimulation (NMES)
- Transcutaneous electrical nerve stimulation (TENS)
- Physical agents and mechanical modalities may include: *Physical agents:*
  - **Cryotherapy**
- Cold packs
- Ice massage
- Vapocoolant spray
  - **Hydrotherapy**
- Contrast bath
- Pools
- Whirlpool tanks
- **Sound agents**
- Phonophoresis
- Ultrasound
- **Thermotherapy**
- Dry heat

- Hot packs
- Paraffin baths

### **MECHANICAL MODALITIES**

- Compression therapies (prefabricated)
- Compression garments
- Skill Category Description of Minimum Skills
- Vasopneumatic compression devices
- Taping
- Compression bandaging (excluding lymphedema)
- Gravity-assisted compression devices
- Standing frame
- Tilt table
- Mechanical motion devices
- Continuous passive motion (CPM)
- Traction devices
- Intermittent
- Positional
- Sustained
- Documentation of all listed competencies in SOAP notes format

### **Note**

It is mandatory for each student to document minimum 16 cases per semester. (1 cases per week) in clinical logbook duly checked and signed by clinical supervisor on weekly basis and head of institute at completion.

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## **RESEARCH PROJECT:**

### **Course Outcomes:**

1. At the end of their research project students should be able to
2. Design and execute a research proposal and research article

### **Course Learning Objectives:**

10. Demonstrate development of their research title
11. Define their methodology
12. Demonstrate their research write up and literature review
13. Demonstrate data analysis
14. Demonstrate the skills to write up their results and discussions
15. Demonstrate teamwork



## **LEARNING STRATEGIES**

### **Interactive Lectures**

The traditional lecture system is used to introduce a subject and discuss the broad concepts in that specific field of study. Interactive lectures to smaller groups remain an effective and essential way of teaching. More recent methods of learning and teaching, such as case-based learning and small group-based problem-solving sessions are also employed.

### **Small Group Based Learning**

Small group and tutorial sessions are regularly held every week to enable students to discuss the details of a lecture topic. Students are expected to prepare presentations on applied topics and discuss their implications with their fellow students. The lecturer acts as a facilitator. By participating in these group discussions, students can interact and learn from one another.

### **Hands on Training**

Practical sessions are conducted to reinforce concepts developed during theoretical sessions. Laboratory work is a vital part of Anatomy, Physiology, and Kinesiology which provides an opportunity for students to make their own personal observations in relation to the theoretical knowledge they gain. Lectures and tutorials are held for providing clinical orientation on the subjects.

Clinically-oriented topics are identified within the framework of anatomical information, which are structured, and case-based.

### **Clinical/Practical Learning**

Theoretical and practical knowledge is augmented with community services and early integration of clinics.

### **Seminars**

The BUCPT regularly organizes seminars where groups of students are encouraged to independently present topics of general interest before a larger audience. This encourages students to read beyond their textbooks and learn how to support their knowledge with research and help them in improving their communication skills to develop leadership qualities.

## **Community-based Learning**

BUCPT is committed to provide the environment and training that would enable professionalsto successfullycontribute to the improvement ofthe health sector, particularly in less privileged communities under the Community-Oriented Medical Education Program.

**The university involves its students inresearch-developing work inthese designated communities. Students are encouraged to participate in the preventive and curative care and management of patients and their families in Primary Health Care field settings.**

**Head Counselor/Head Mentor:**

BUCPT have student assisting program such as mentoring. Mentors have been already assigned at the start of teaching program. The students will meet the assigned mentor in the mentor's office to discuss academic, non-academic, experiences, problems for advice and guidance.

**Who to contact?**

The class is divided into equal groups of students and each group has a designated teacher, who works as their mentor. The students will meet their mentor once a month, first Friday of the month, in their office to discuss the academic, social, and other problems with them and seek their advice and guidance.

The mentor will report to the head mentor monthly, in case any problem is not resolved even at that level, then the head mentor can refer the case to Vice Principal and then Principal accordingly.

## INTRODUCTION TO DEPARTMENTS

### The College Of Physical Therapy

BUCPT established on 15<sup>th</sup> February 2017. The College Of Physical Therapy is located on the 4<sup>th</sup> Floor in BUHSC building adjacent to PNS Shifa.

The college houses Principal office. P.A to Principal office, faculty rooms, Kinesiology, Medical Physics, Biomechanics & Therapeutics Lab.

Name	Designation
Dr. Khalid Aziz	Principal/Senior Associate Professor
Dr. Abida Arif	Sen. Assistant Professor
Dr. Ghousia Shahid	Sen. Assistant Professor
Dr.M.Usman	Snr. Assistant Professor
Dr. Syeda Rida Baqir	Snr. Assistant Professor
Dr. Rabia Khan	Snr. Assistant Professor
Dr. Komal	Assistant Professor
Dr. Seyyada Tahniyat Ali	Assistant Professor
Dr. Sharjeel Tasneem	Assistant Professor
Dr. Hajra Ameer Shaikh	Senior Lecturer
Dr. Prem Lata	Senior Lecturer
Dr. Syeda Sana Waheed	Lecturer

## THE DEPARTMENT OF ANATOMY

The Department of Anatomy at Bahria Medical and Dental College comprises of well trained and experienced postgraduate faculty members. The subject of Anatomy is one of the core basic science subjects. The teaching methodology adopted is a combination of traditional and newer learning methods.

For student learning, the department includes spacious and well-equipped museum, dissection hall, histology laboratory, and a micro technique section.

### Head of Department

### Facilitators

S.No	Name	Designation
1	Prof.Dr.Yasmeen Mehar	HOD
2	Dr. Aisha Qamar	Senior Professor
3	Dr. Long Umme Dani	Associate Professor
4	Dr. Ayesha Mehwish	Assistant Professor
5	Dr. Shahab Shafi	Lecturer
6	Dr. Bilal	Lecturer

## DEPARTMENT OF PHYSIOLOGY

Human Physiology is the branch of medicine that deals with the study of functions of human body. It is intimately related with Human Anatomy, Biochemistry, Pharmacology, pathology, Behavioral Sciences. For student learning, the physiology laboratory is very well equipped with latest and modern gadgets, apparatus and instruments.

The learning resources include books, interactive CDs, colorful transparencies, and internet facilities.

S.No	Name	Designation
1	Prof.Dr.Shazia Shakoor	Senior Professor (HOD)
2	Dr.Shaikh Abdul Saeed	Senior Professor
3	Prof.Irum Saddique	Senior Professor
4	Dr.Saifullah Shaikh	Professor
5	Dr. Hina Moazzam	Associate Professor
6	Dr. Saasi Kanwal	Assistant Professor
7	Dr. Fatima Zehra	Assistant Professor
8	Dr. Sana Akbar	Senior Lecturer
9	Dr. Rabia Saddique	Senior Lecturer
10	Dr. Zahra Tapal	Senior Lecturer
11	Dr. Noor ul Ain	Senior Lecturer
12	Dr.Shadman Nasreen	Senior Lecturer
13	Dr. Anum	Lecturer
14	Dr. Saira Aslam	Lecturer
15	Dr.Faryal Zaidi	Lecturer
16	Dr. Zakia	Lecturer

## Department of General Education:

According to HEC undergraduate policy and PMDC guideline, a mandatory set of 30 credit hours for general education courses shall be comprised of all undergraduate/equivalent degree programs. The provision of general education courses ensures that every student is acquainted with the broad variety of fields of inquiry and approaches to knowledge and skills. It offers students an intellectual foundation for their academic, professional, and personal attributes while focusing on critical thinking and writing, speaking or quantitative skills.

### Faculty of Department of General Education:

S.No	Name	Designation	Subject
1	Dr. Najmul Sahar Ilyas	<b>Head of Department</b> Senior Assistant professor	Islamic Studies
2	Ms. Uzma Shabbir	Senior Lecturer	English
3	Mr. Yousuf Sajjad	Senior Lecturer	Pakistan Studies
4	Ms. Kubra Bashir	Senior Lecturer	Computer Science
5	Mr. Osama Fakhruddin	Lecturer	Islamic Studies
6	Mr. Ahmed Faraz Ayyubi	Lecturer	Mathematics
7	Muhammad Noman Noorani	Lecturer	English
8	Sabahat Raza	Lecturer	Sociology
9	Sayyeda Mahnoor Zehra	Lecturer	Biostatistics
10	Ms. Yusra Anees	Lecturer	English

**The Gazette of Pakistan**

**EXTRAORDINARY PUBLISH BY AUTHORITY**

ISLAMABAD, THURSDAY, MARCH 11, 2010

[THE PROTECTION AGAINST HARASSMENT OF WOMAN AT THE  
WORKPLACE ACT 2010)

(Summarized Version for students of BUHSC)

1. A special legislation by the Government titled ‘The Protection against Harassment of Woman at Workplace Act 2010’ was passed in 2010 subsequent to which, HEC in 2011 also issued a detailed ‘Policy Guidelines against Sexual Harassment in institutions of Higher Learning’, revised in 2016 and now re-issued afresh on 15 July 2020. The purpose of the act and the HFC Guidelines was to promote the development of working environment free intimidation. Higher Education Institutes (HEIs) are considered to be venues of learning and knowledge, where sexual harassment disrupts the academic environment, while also threatening the teaching and learning process, besides well-being of students, faculty and staff.

Focal Persons

2. Harassment Complaint Cells are to be established at each Campus with two Focal Persons at each Campus. The primary function of Focal Persons is to offer support and immediate assistance to those who have experienced sexual harassment. Focal Persons at BUHSC (K) are as follows:

<b><u>BU Health Sciences Campus (Karachi)</u></b>	
Prof. Dr. Khalid Mustafa Vice Principal (Medical) Ag. HOD of Forensic Medicine	Cell: 0300-2130868 Phone: 021-35319491-9 Ext: 1038 & 1070 Email: <a href="mailto:khalid.bumdc@bahria.edu.pk">khalid.bumdc@bahria.edu.pk</a> <a href="mailto:drkhalidmm@yahoo.com">drkhalidmm@yahoo.com</a>
Prof. Dr. Shazia Shakoore HOD Physiology	Cell: 0300-3408990 Phone: 021-35319491-9 Ext: 1056 Email: <a href="mailto:shazia.bumdc@bahria.edu.pk">shazia.bumdc@bahria.edu.pk</a> <a href="mailto:shazia2304@hotmail.com">shazia2304@hotmail.com</a>



Inquiry Committees for Sexual Harassment Complaint will function i.a.w. the guidelines contained in HEC's Policy Guidelines (Ref C) and Govt Acts (Ref A & Ref B). The details of the Inquiry Committees at each BU Campuses will be as mentioned below:

<b>a. <u>BU Health Sciences Campus (Karachi)</u></b>	
Prof. Shama Asghar Professor of Operative Dentistry Chairperson	Cell: 0334-3078082 Phone: 021-35319491-9 Ext: 1121 Email: <a href="mailto:sham.bumdc@bahria.edu.pk">sham.bumdc@bahria.edu.pk</a> <a href="mailto:sham.asghar24@gmail.com">sham.asghar24@gmail.com</a>
Prof. Dr. Nasim Karim Principal, BUHS-PGI HOD Pharmacology Member	Cell: 0332-3151774 Phone: 021-35319491-9 Ext: 1057 & 1072 Email: <a href="mailto:nasimkarim.bumdc@bahria.edu.pk">nasimkarim.bumdc@bahria.edu.pk</a>
Dr. Aini Samreen Associate Professor, Gyn & Obs Member	Cell: 0333-3763592 Phone: 021-35319491-9 Ext: 1064 Email: <a href="mailto:aini.bumdc@bahria.edu.pk">aini.bumdc@bahria.edu.pk</a> <a href="mailto:drsam222@yahoo.com">drsam222@yahoo.com</a>

## **Appellate Bodies**

1. As per HEC's Policy Guidelines (Ref C), both the complainant and the respondent shall have a right to appeal the decision of the Inquiry Committee within a period of 30 days from the date of notification of the decision. Appellate Bodies for hearing the said appeals at each BU Campuses will be as mentioned below.

<b><u>BU Health Sciences Campus (Karachi)</u></b>	
Capt (R) Noaman Imam PN Director Campus Chairman	Cell: 0336-9369222 Phone: 021-35319491-9 Ext: 1001 Email: <a href="mailto:dac.bumdc@bahria.edu.pk">dac.bumdc@bahria.edu.pk</a>

Dr Farzeen Tanwir HOD Periodontology Member	Cell: 0336-1802464 Phone: 021-35319491-9 Ext: 1104 Email: <a href="mailto:farzeentanwir21@gmail.com">farzeentanwir21@gmail.com</a>
Dr. Saifullah Shaikh AP Physiology Member	Cell: 0333-2279425 Phone: 021-35319491-9 Ext: 1066 Email: <a href="mailto:dr.saif74@yahoo.com">dr.saif74@yahoo.com</a>

Harassment means any unwelcome sexual advance, request for sexual favors or other verbal or written communication or physical conduct of a sexual nature of sexually demeaning attitudes, causing interference with work performing or creating an intimidating, hostile or offensive work environment, or attempt to punish the complainant for refusal to comply to such a request or is made a condition for employment.

The enquiry committee shall submit its findings and recommendations to the Competent Authority within thirty days of the initiation of enquiry. If the Inquiry Committee finds the accused to be guilty it shall recommend to the Competent Authority for imposing one or more of the following penalties:

(i) Minor penalties:

(a) Censure;

(b) Withholding for specific period promotion or increment;

(c) Stoppage, for specific period, of an efficiency bar in the time-scale, otherwise

than for unfitness to cross such bar; and

(d) Recovery of the compensation payable to the complainant from pay of any other source of the accused.

(ii) Major Penalties:

(a) Reduction to a lower post or time-scale, or to a lower stage in a time-scale;

(b) Compulsory retirement

(c) Removal from service

(d) Dismissal from service; and

(e) Fine. A part of the fine can be used as compensation for the complainant. In case of the owner, the fine shall be payable to the complainant

## Inquiry Committee

### **CODE OF CONDUCT FOR PROTECTION AGAINST HARASSMENT OF WOMAN AT THE WORKPLACE**

1. An informal approach to resolve a complaint of harassment may be through mediation between the parties involved and by providing advice and counseling on a strictly confidential basis.
2. A complainant or a staff member designated by the complainant for the purpose may
3. report an incident of harassment informally to her supervisor, or a member of the Inquiry committee, in which case the supervisor or the committee member may address the issue at her discretion in the spirit of this Code. The request may be made orally or in writing.
4. If the incident or the case reported does constitute harassment of a higher degree and
5. the officer or a member reviewing the case feel that its needs to be complainant, the case can be taken as a formal complaint.
6. A complainant does not necessarily have to take a complaint of harassment through the informal channel. She can launch a formal complaint at any time.
7. The harassment usually occurs between colleagues when they are alone, therefore usually it is difficult to produce evidence. It is strongly recommended that staff should report offensive behavior immediately to someone they trust, even if they do not wish to make a formal complaint at the time.
8. **HEC POLICY ON PROTECTION AGAINST SEXUAL HARASSMENT IN HIGHER EDUCATION INSTITUTIONS**
9. Higher Education Institutions (—HEIs) are highly consequential institutions in society that are dedicated to the pursuit and dissemination of knowledge. Members of the HEI community have several important rights and privileges, central among which is the right to pursue inquiry and search for knowledge without hindrance from unlawful or otherwise unacceptable constraints. The HEC takes very seriously the freedom of

teacher<sup>5</sup>, researchers, scholars, students to live and work in a safe environment in which their dignity is protected.

10. Protection /against sexual harassment is important not only because it threatens the freedom and conduciveness of the environment and the institutions of higher learning. At a more fundamental level, such conduct is unacceptable because it violet personal dignity and shall not be tolerated at HEIs in Pakistan under any circumstance.
11. All administrators, deans, managers, faculty, department chairs, directors of schools or program and others in supervisory or leadership positions have an obligation to be familiar with and to uphold this policy and its procedures along with informing members of their staff about its existence.
12. In order to ensure protection of women against harassment complaint may be lodge by any person who has experienced sexual harassment with either the focal person or with any member of the Sexual Harassment Inquiry Committee.
13. XXX ----- XXX

## **INTRODUCTION**

The Study guide serves as a useful handy resource, helping you to navigate your journey at the Health Science Campus

The Study guide is more than an academic guide.

It not only highlights what, as a student, you should aim to achieve as you work through the curriculum, but also provides essential information about various administrative protocols that you as students of Bahria University are expected to follow.

### **SECTION 1: POLICIES AND COMMITTEES**

This section summarizes some key aspects of policies in vogue at Bahria University. The student is advised to read the detail in the latest edition of Bahria University's Student Handbook

#### **STUDENT'S CODE OF CONDUCT**

Every student shall observe the following code of conduct in the University premises, in the University administered hostels (on and off-campus) and places of other activities being held under the auspices of the University:

- Loyalty to Pakistan and refraining from doing anything which is repugnant to its honor and prestige in any way.
- Respect for convictions and traditions of others in matters of religion, conscience and customs while observing own religious duties/customs.
- Truthfulness and honesty in dealing with other people.
- Respect for elders and politeness to all, especially to women, children, elders, the weak and the helpless.

- Special respect for teachers and others in authority in the CUs and BU.
- Cleanliness of body, mind, speech and habits.
- Helpfulness to fellow beings.
- Devotion to studies and prescribed co-curricular activities.
- Observance of thrift and protection of public property.
- Observance of the rules and regulations of the CU in force from time to time.

### **PROHIBITED ACTS & MISCONDUCT/ILL-DISCIPLINE**

The following acts shall be unacceptable, and their commission shall be construed as misconduct or ill-discipline:

- Breach of the Code of Conduct.
- Smoking in the areas prohibited by the University.
- Consumption or possession of alcoholic drinks or other intoxicating drugs within the CU/ vicinity or while attending off-site instructions, sports, cultural tours or survey camps.
- Organizing or taking part in any function inside the campus, or organizing any club or society of students, except where permitted and in accordance with the prescribed rules and regulations.
- Collecting donations or receiving funds or pecuniary assistance for or on behalf of the CU except with the

written permission of the Head of the CU or any other person authorized in this behalf.

- Staging, inciting or participating in or abetting any walk- out, strike or other form of agitation against BU, its CUs or students, teachers, officers or authorities; inciting others to violence; disruption of the peaceful atmosphere in any way; making inflammatory speeches or gestures which may cause resentment; issuing of pamphlets or cartoons which cast aspersions on the students, teachers, staff or University authorities/bodies; doing anything in a way likely to promote rift and hatred amongst the students; issuing statements in the press; making false accusations against or lowering the prestige of BU or its students, teachers, administrators, staff or bodies.
- Disobeys the lawful orders of a teacher or other person in authority.
- Habitually neglects work or absents from the classroom without valid reason.
- Willfully damages public property or the property of fellow students or any teacher or employees of BU and its CUs.
- Does not pay the fees, fines, or other dues payable under the laid down rules and regulations; uses indecent language; wears immodest dress; makes indecent remarks; gestures; behaves in a disorderly manner;



commits any criminal, immoral or dishonorable act (whether committed within the CU or outside) or any act which is prejudicial to the interests of BU and its CUs; and/or

- Commits an act of sexual harassment, as defined in the HEC's document „Policy Guideline against Sexual Harassment in Institutions of Higher Learning“.

### **ACTION AGAINST MISCONDUCT**

Every member of the faculty shall have the power to check any disorder or improper conduct, or any breach of the rules, by students in any part of the campus or outside when the visit is sponsored or organized by it. Misconduct in a classroom when a student is under the charge of a teacher shall not be allowed and a punitive action such as a fine, removal from the classroom or a punishment of greater magnitude may be imposed as decided by the authority so empowered. The Student Advisor, the Admin Officer or any other employee authorized by the Head of the CU shall be responsible for the maintenance of good behavior and law and order amongst the students on the premises of the CU.

### **PENALTIES:**

A student guilty of an act of indiscipline shall be liable to the penalties specified below or promulgated through written orders/notifications:

<b>Penalty Code</b>	<b>Penalty</b>	<b>Awarding Authority</b>	<b>Appellate Authority</b>
1	Removal from classroom, laboratory, or field work, for a maximum period of two contact Hours	Teacher In- Charge	HOD
2	Expulsion from games or field work for not more than one Week	Games/ Field Work In-Charge	Director
3	Expulsion from educational visits and sports tours	DD (Admin & Coord) or an officer authorized by the Head of the CU	Director
4	Suspension from classes for a period not exceeding two	Director/ Principal	Head of the CU

	Weeks		
5	Monetary penalties	Director/ Principal	Head of the CU
6	Removal from a position of authority on the advice of the Student Advisor / HOD	Director/ Principal	Head of the CU
7	Expulsion from the Hostel	Head of the CU	Next Higher Authority
8	Cancellation of remission of fees/assistantship/scholarship etc.	Head of the CU	Next Higher Authority
9	Rustication for one or more semester	Head of the CU with concurrence of BUHO	Rector
10	Expulsion from the CU	Head of the CU with concurrence of BUHO	Rector

### **PROCEDURE IN CASE OF BREACH OF DISCIPLINE:**

A teacher, a staff member or a BU Officer in whose presence or in relation to whom an act of indiscipline has been committed or who gets to know of such act, may deal with the

case him/herself, or if in his/her view the case is one which can be more appropriately dealt by another authority or which warrants a penalty of greater magnitude than they are competent to impose, shall refer the case to the Student Advisor or Deputy Director (Admin & Coord) or the higher authority as the case maybe.

All cases of serious breach of discipline shall be referred to the Disciplinary Committee for investigation which, after due process of investigation, will either impose the penalties if within its powers or recommend them to the Campus Head/Head of the CU/Rector, as the case may be.

When a case against a student is referred to the Disciplinary Committee, it may, if it deems fit, suspend the student from the classes till the finalization of the case, with the approval of the Head of the CU.

### **APPEALS**

An appeal against the penalty may be filed by the student with the Appellate Authority within 30 days of announcement of the punishment. No appeal by a student shall be entertained unless it is presented within 30 days from the date of communication of the decision, provided that the Rector may, for valid reasons, extend this period.

No appeal shall lie against the decision of an authority imposing a penalty other than rustication or expulsion except on the grounds that such authority imposed a penalty which it was not competent to impose.

An appeal on the grounds that an authority imposed a penalty which it was not competent to impose, shall lie with the body or person of higher authority than the one who imposed the 44 penalty.

### **COMPENSATION FOR LOSS**

The Head of the CU, or any teacher or officer to whom he may delegate the powers, may instruct a student to pay compensation for any loss or damage to property belonging to the CU/University, public authority, a fellow student or an employee of the CU/University, caused by a willful act or gross negligence of the student. If the student does not pay such compensation within a specified period, the Head of the CU will proceed against the student in the manner as prescribed in these rules.

### **OFFENCES DURING EXAMINATION**

Cases of indiscipline in or around the Examination Hall, and use of unfair means, shall be dealt with by the Examination Committee.

**DRESS CODE:**

Male students:

1. Dress/Casual Trousers
2. Jeans (Plain blue) without an image, graphics, and write ups
3. Casual Shirts (Half/ Full sleeves)
4. T Shirts without any messages, images, graphics, and write ups
5. Dress/Casual shoes or Joggers with socks (no sandals)
6. Shalwar Kameez with shoes (only on Friday)
7. Suit/ Combination
8. Coat/ Pullovers/ Sweaters/ Jackets in winter

Female students:

1. Shalwar Qameez (no sleeveless)
2. Hijab, Abaya, Chaddar etc
3. Full length Jeans(no tights) with long shirt/ kurta (knee length)
4. Light jewelry and light makeup
5. Shoes, Sandals and Joggers
6. Dupatta/ Scarf is compulsory with all dresses

**NOTE: All BUHSC students are expected to wear white coat during classes, laboratory and hospital rotations, as well as outside the campus, when on official visit.**

**STUDENT CARD:**

Students shall be issued ID Cards. The students shall be required to wear their ID Cards in the campus and show them to the authorized persons on demand.

**LOSS OF ID CARD:**

In case ID Card is lost, it should be immediately reported to the Office of the Dy Director (Academics) who will make arrangements for re-issue of a new card by the University after payment of fine.

**PERSONAL BEHAVIOR.**

The University expects that all students should sustain professional manner when interacting with colleagues and others. The University recognizes that personalities, characters, and management styles may differ but, notwithstanding these differences, as a minimum standard, all are expected to:

- Work co-operatively with each other to achieve objectives and establish good working relationships.
- All should behave and speak professionally, respectfully, and courteously at all times.

- Tidiness and cleanliness must be always adhered to within the BUDC premises which will help us maintain a safe, clean, and professional learning environment.
- Use the college's property, facilities, supplies, and other resources in the most effective and efficient manner.
- Unacceptable behavior such as aggressive or abusive behavior, shouting or personal insults or spreading rumors or gossip, or insulting someone is to be avoided at all costs. All these matters, if experienced, should be reported to the vice principal or your mentor or a senior faculty member.

### **PUNCTUALITY:**

Students are expected to arrive in class well in time. All cell phones, smartphones, and other electronic devices (e.g., pagers, iPods) must be turned off and hidden from view during class time. Talking and other disruptive behaviors are not permitted while classes are in session. If the students miss a class, they are themselves responsible for the missed part of the course. It is the student's responsibility to contact a classmate or teacher to determine and cover what was missed.



At BUDC classes start immediately after holidays. There is no lag period after leave. There will be no relaxation for students who are absent. **Please inform your parents of this and make your travel arrangements accordingly.** Avoid taking leave for personal reasons like weddings during the academic year.

## **CONDUCT IN LIBRARY**

The University campuses have well stocked libraries, and time spent by the students there will meet your research requirements in a calm place. The libraries also provide electronic access through the internet to databases throughout the world.

Library also provides plagiarism detection services

While using the library, Mobile Phones/ iPods/ laptops should be kept on silent mode. Sleeping, listening/ watching drama and music etc, while staying at library is prohibited.

## **RULES FOR BORROWING BOOKS**

1. Students are permitted to borrow 3 books at a time for a maximum period of 14 days. Books borrowed may be re-issued on completion of the time period.

2. A valid University card is must for borrowing the Book(s) and other material
3. Textbooks will be issued for 7 working days only but may be reissued the next day of the due date
4. For the Book(s) returned after the due date, a fine of Rs.10/- per day would be charged.
5. Book Bank books will be issued for a period of whole/ one semester.
6. Writing, underling or marking any book is strictly prohibited. Library books are carefully examined on return and the borrower will be held responsible for any damage
7. Following library material will not be issued and must be consulted in the library:
  - a. Reference Material.
  - b. Thesis/ Project Reports.
  - c. Audio/ Video cassettes/ CDs/ DVD's.
  - d. Magazines and periodicals.
  - e. Newspapers.

### **LIBRARY TIMINGS**

DAY	TIMINGS
WEEKDAYS: MON- FRI	8:30 AM to 8:30 PM
WEEKENDS	9:00 AM to 8:30 Pm

### **CONDUCT IN CAFETERIA AND COMMON ROOMS**

Campus has a cafeterias with a variety of food items and snacks available at reasonable rates

Students are expected to show care, courtesy towards the cafeteria staff as well as to others.

Place garbage and recyclables in the appropriate containers. This behavior will maintain a clean and enjoyable environment for all.

### **ACADEMIC MISCONDUCT AND DISCIPLINARY COMMITTEE**

The Discipline Committee is responsible for maintaining discipline (both academic as well as conduct), and deals with all cases of indiscipline on the part of students.

It recommends award of penalties/ punishments and renders advice to the Director on administrative matters needed to maintain a peaceful environment on the campus. Intimation will be sent to BUHO for all penalties awarded to a student

### **MEMBERS OF THE COMMITTEE**

Chairperson	Brig (Retd) Prof. Syed Pervez Ashgar, BUMC
Secretary	Dr. Jaweria Zeesha, BUMC
Members	Prof. Dr. Khalid Aziz, Principal, BUCPT Prof. Dr. Ahmed Omer, BUDC Prof. Dr. Yasmeen Mehar, BUMC Associate Prof. Abida Razzaq, VP PNNC
Co-opted member	Varies according to the case

### **STUDENTS ARE TO AVOID THE FOLLOWING:**

- a) Unauthorized use of University's name or logo which is property of university.
- b) Harassment, sexual or otherwise, or intimidation of any member of university.
- c) Coming late for classes. The student may be considered absent and marked accordingly.
- d) Improper/inappropriate dress

- e) Loud and aggressive behavior in Cafeteria or Common rooms or within the premises of BUHS or PNS Shifa.
- f) Non clearance of bills/dues. Non-clearance of dues may prevent student from appearing in the professional examination. The student may also be refused permission to attend classes.

#### **USE OF MOBILE PHONE**

- a) Use of mobile phone for photography at cafeteria is restricted.
- b) Library is „NO Mobile Zone“ area.
- c) Use of mobile in class room is prohibited.
- d) Students are not allowed to use mobile phone for photography/ video capturing during farewell parties.
- e) Making videos, images, Vlogs etc are monitored through CCTV cameras installed inside and outside building.

#### **SMOKING**

Student guilty of an act of smoking in the premises of Bahria University/ Constituent Unit or while entering/ attending offsite instructions like sports, cultural tours or survey campus shall be liable to the penalties asunder:

<b>Occasion</b>	<b>Penalties</b>
1st occasion of offence	Fine of Rs.5000/- along with
on act of smoking.	warning letter with copy to parents from Director Campus
2nd or onward occasion of offense(s).	Fine of Rs.10,000/- along with warning letter (s) with copy to parents from DG Campus on each offence.

Student guilty of an act of possession/ consumption/ usage/ supplying of intoxication drugs/ Alcoholic drinks in premises of CU and or entering CU or events of BU being intoxicated and or during official/ informal offsite events of the University shall be liable to expulsion from the CU.

### **CRIMINAL CONVICTION**

- a) Applicants are required to inform BU of any criminal conviction. Full details are to be provided.
- b) The University reserves the right to refuse admission to any applicant with a criminal conviction that may jeopardize the reputation of the University.
- c) Failure to declare any criminal conviction by a student already enrolled in BU shall result in immediate cancellation of his/her admission.

- d) Where admission to the program is denied on the basis of the criminal conviction, the applicant will be notified of the decision in writing by respective Campuses/CUs

## **ACADEMIC MISCONDUCT**

Following acts shall constitute academic misconduct:

- a. Cheating.
- b. Fabrication.
- c. Misuse.
- d. Forgery.
- e. Plagiarism.
- f. Facilitating academic misconduct.
- g. Academic Dishonesty.

The student is advised to refer to their Student Handbook to become fully cognizant of these terms.

## PENALTIES FOR ACADEMIC MISCONDUCT

TYPE OF MISCONDUCT	PENALTY
Attempt (Successful/ unsuccessful) to know contents of question papers through unfair means prior to examination	<p><b><i>Minor punishment</i></b></p> <p>a Warning letter (Copy to parents)</p> <p>b. Fine of Rs.2,000.</p> <p><b><i>Major punishment</i></b></p> <p>a. Expulsion from the University</p> <p>b. Fine Rs. 5000/00.</p> <p>c. Letter to parents</p>
<p>Possession of written material, relevant to the subject/paper concerned.</p> <ul style="list-style-type: none"> <li>• Writing on palm, arm or anywhere on the candidate's body or clothes whether the written material is relevant or irrelevant to the concerned paper.</li> <li>• Possession of Mobile phones, Smartwatches, PDAs and other electronics devices, whether or not carrying any relevant or irrelevant material in the memory.</li> </ul>	<p>a. Grade „F“ in the subject.</p> <p>b. Fine Rs 5,000.</p> <p>c. Warning, copy to parents.</p> <p>d. Mobile phones/electronic devices to be confiscated. (will be returned after investigation)</p>
Giving/receiving assistance or allowing any other candidate to copy from his/her answer books.	<p><b><i>Minor Punishment</i></b></p> <p>a. Cancellation of the relevant paper.</p> <p>b. Fine Rs 2,000/-.</p> <p>c. Letter of Warning.</p>



	<p><b><i>Major Punishment</i></b></p> <p><b>a.</b> Grade „F“ in the subject.(for students involved)</p> <p><b>b.</b> Fine Rs 5,000/-</p> <p><b>c.</b> Letter of Warning.</p>
<p>Removing a leaf from answer book.</p> <p>Taking the whole or a part of an answer book or a continuation sheet into or out of examination hall.</p>	<p><b>a.</b> Grade “F” in the subject. (for students involved)</p> <p><b>b.</b> Fine Rs. 5,000.</p> <p><b>c.</b> Letter of warning</p>
<p>Substituting the whole or a part of an answer book or a continuation sheet not duly issued to him for the examination;</p>	<p><b>a.</b> Grade „F“ in the subject. (For students involved)</p> <p><b>b.</b> Fine Rs 5,000.</p> <p><b>c.</b> Letter of Warning.</p>
<p>Forging, mutilating, altering, erasing or otherwise tampering with marked answer scripts</p>	<p><b>a.</b> Grade “F” in the subject. (for students involved)</p> <p><b>b.</b> Fine Rs 5,000.</p> <p><b>c.</b> Letter of Warning</p>
<p>Impersonation</p>	<p><b>a.</b> Grade “F” in all subjects of relevant semester studied at BU</p>

	<p>(including the impersonator/facilitator, if a student of BU).</p> <p>b. Expulsion from the university (including the impersonator/ facilitator, if a student of BU).</p> <p>c. In case the impersonator/facilitator is an ex- student of BU or not a BU student, an FIR may be lodged for the offence, as per law of the land.</p>
Using abusive or obscene language in answer book	<p>a. Grade "F" in the relevant course.</p> <p>b. Fine Rs 5,000.</p> <p>c. Letter of Warning.</p>
Refusing to obey the Invigilator or Head Invigilator in the Examination Hall and misbehaving, resorting to misconduct, or creating any kind of disturbance in or around the Examination Hall	<p><b><i>Minor Punishment</i></b></p> <p>a. Grade "F" in the course.</p> <p>b. Fine Rs 5,000.</p> <p>c. Letter of Warning.</p> <p><b><i>Major Punishment</i></b></p> <p>a. Rustication for one Semester.</p> <p>b. Grade „F" in the course.</p>

	c. Fine Rs5,000/ d. Letter of Warning.
Communicating or attempting to communicate with Examiners with the intention of influencing them in the award of marks.	<b>a.</b> Cancellation of relevant paper. <b>b.</b> Fine Rs 5,000. <b>c.</b> Letter of Warning.
Possession of firearms, knives etc. inside and in the close vicinity of Examination Hall	<b>a.</b> Expulsion from the University. <b>b.</b> Fine Rs 5,000. <b>c.</b> Letter of Warning.

## SEXUAL HARASSMENT

All students are required to educate and familiarize themselves about the act/actions categorized as "Sexual Harassment" may it be physical, verbal or while utilizing electronic media and refrain from it being a punishable offence.

Higher Education Commission has issued very strict policy guideline against "Sexual Harassment in Higher Education Institutions (HEI)".

All such policies are strictly applicable and followed in Bahria University.

All students are therefore required to go through the entire policy's contents which are available with campus (concerned HODs) and University/ HEC website.

- The Protection against Harassment of Women at Workplace Act, 2010
- The Protection against Harassment of Women at Workplace (Amndt) Ac& 2022.
- HEC Policy on Protection against Sexual Harassment in HEIs effective 01 July 2020

### **COMMITTEE FOR PROTECTION AGAINST SEXUAL HARASSMENT IN BUHSCK**

<b>FOCAL PERSONS</b>	
Prof. Dr. Khalid Mustafa Vice Principal (Medical)	Cell 0300-21 30868 Phone: 021-35319491-9, ext: 1038 & 1070 Email: khalid.bumdc@bahria.edu.pk drkhaiidmm@yahoo.com
Prof. Dr. Shazia Shakoore HOD, Physiology	Phone: 021-35319491-9 Ext: 1056 Email: shazia.bumdc@bahria.edu.pk shazia2304@hotmail.com
<b>INQUIRY COMMITTEE</b>	
Prof. Shama Asghar, Chairperson Vice Principal, Dental Professor of Operative Dentistry	Cell 0334-3078082 Phone: 021-35319491-9 ext: 1121 Email: sham.burndc@bahria.edu.pk sham.asghar24@gmail.com
Prof. Dr. Nasim Karim Principal, BUHS-PGI HOD Pharmacology Member	Cell m51774 Phone: 021-35319491-9, ext: 1057 & 1072 Email: nasimkarim.bumdc@bahria.edu.pk
Dr Aini Samreer Associate Professor,	He 0333-3763592 Phone: 021-35319491-9 ext: 1064

Gyn & Obs Member	Email aini.bumdc@bahria.edu.pk drsam222@yahoo. Com
<b>APPELLATE BODY</b>	
Capt (R) Noaman Imam PN Director Campus Chairman	Cell 0336-9369222 Phone: 021-35319491-9 Ext: 1001 Email: dac.burndc@bahria.edu.pk
Dr. Farzeen Tanwir HOD Periodontology Member	Cell 0336-1802464 Phone: 021-35319491-9 Ext: 1104 Email: farzeentanwir21@ gmail.com
Dr. Saifullah Shaikh Assistant Professor, Physiology Member	Cell 0333-2279425 Phone: 021-35319491-9 Ext: 1066 Email: dr.saif74@yahoo.com

### **CODE OF CONDUCT FOR PROTECTION AGAINST HARASSMENT OF WOMAN AT THE WORK PLACE**

1. An informal approach to resolve a complaint of harassment may be through mediation between the parties involved and by providing advice and counseling on a strictly confidential basis.
2. A complainant or a staff member designated by the complainant for the purpose may report an incident of harassment informally to her supervisor, or a member of the Inquiry committee, in which case the supervisor or the committee member may address the issue at her discretion in the spirit of this Code. The request may be made orally or in writing.
3. If the incident or the case reported does constitute harassment of a higher degree and the officer or a member reviewing the case feel that it needs to be complainant, the case can be taken as a formal complaint.

4. A complainant does not necessarily have to take a complaint of harassment through the informal channel. She can launch a formal complaint at any time.
5. The harassment usually occurs between colleagues when they are alone, therefore usually, it is difficult to produce evidence. It is strongly recommended that staff should report offensive behavior immediately to someone they trust, even if they do not wish to make a formal complaint at the time.

## **HEC POLICY ON PROTECTION AGAINST SEXUAL HARASSMENT IN HIGHER EDUCATION INSTITUTIONS**

1. Higher Education Institutions ("HEIs") are highly consequential institutions in society that are dedicated to the pursuit and dissemination of knowledge. Members of the HEI community have several important rights and privileges, central among which is the right to pursue inquiry and search for knowledge without hindrance from unlawful or otherwise unacceptable constraints. The HEC, takes very seriously the freedom of teachers, researchers, scholars, students to live and work in a safe environment in which their dignity is protected.
2. Protection against sexual harassment is important not only because it threatens the freedom and conduciveness of the environment and the institutions of higher learning. At a more fundamental level, such conduct is unacceptable because it violates personal dignity and shall not be tolerated at HEIs in Pakistan under any circumstance.
3. All administrators, deans, managers, faculty, department chairs, directors of schools or program and

others in supervisory or leadership positions have an obligation to be familiar with and to uphold this policy and its procedures along with informing members of their staff about its existence.

4. In order to ensure protection of women against harassment complaint may be lodge by any person who has experienced sexual harassment with either the focal person or with any member of the Sexual Harassment Inquiry Committee.

### **STUDENTS GRIEVANCES OVERSIGHT COMMITTEE**

There shall be a Student Grievances Oversight Committee (SGOC), at CU level for each department, to address grievances of students against any teacher, instructor, or administrative staff, with respect to matters of code of conduct, grades, or any administrative matter. The committee shall comprise:

- a) Head of CU.
- b) HOD.
- c) CU Exam-In-charge.
- d) Two (2) seniors-most FMs of the department.

If grievance is about the award of a grade, the procedure shall be as follows:

- a) The student must submit the grievance, in writing, within seven working days of the receipt of the grade, to the HOD who shall forward it to the SGOC
- b) The SGOC shall hear both sides and will give its decision, which shall be final and binding on all parties, within five working days or before the start of registration for the new semester, whichever is earlier.



## ATTENDANCE POLICY FOR STUDENTS

1. It shall be mandatory for students to attend at least 75% of the Total Contact Hours in a Subject/Course of Study, failing which they will not be allowed to sit in the final examination. The 25% relaxation in attendance is to cater for unforeseen situations like sickness, bereavement in the family, law and order situation, untoward incident etc. On no account, any shortfall in attendance shall be condoned. Attendance once marked shall not be changed
2. Where class attendance clashes with a sports event or any other extra-curricular activity, prior approval of the BUHO shall be sought for participation in the sports event or the extra-curricular activity. If BUHO approves such participation, tutorials shall be arranged to make up for the loss of academic activity. Only after the tutorials for the missed classes have been held that attendance for the missed classes shall be marked and credited to the student's attendance record

### **RESEARCH**

BU has a strong emphasis on research and students are not only taught research methodology as part of their curriculum, but also actively engage in research work, under the supervisor of faculty members.

BUHSC has a Research Advisory Committee that has been specifically formulated to guide students in every aspect of their research, from synopsis writing through to publications in peer reviewed journals.

## (ACADEMIC CLANDER)

Semester Programs	Spring 2025 (18 weeks)	Summer 2025 (7 weeks)
Commencement of Classes	03 <sup>rd</sup> Feb 2025	08 <sup>th</sup> July 2025
Mid-Term Examinations ( Regular Program)	07 <sup>th</sup> April to 15 <sup>th</sup> April 2025	31 <sup>st</sup> July to 2 <sup>nd</sup> August 2025
Final Examinations ( Regular Program )	16 <sup>th</sup> June to 25 <sup>th</sup> June 2025	25 <sup>th</sup> August 2025
Declaration of Result	07 <sup>th</sup> July 2025	6 <sup>th</sup> Sept 2025