SAURASHTRA UNIVERSITY
RAJKOT

Accredited Grade "A"
by NAAC

Faculty of Medicine

Syllabus for
Bachelor of Physiotherapy - B.P.T.

Effective from Academic Year June - 2017-18

Based on
Recommendation of Gujarat State Council for Physiotherapy

Saurashtra University
University Campus, Rajkot – 360 005,
Gujarat, India.

Website: www.saurashtrauniversity.edu
Gujarat State Council for Physiotherapy

Programme & Subject:
Bachelor of Physiotherapy – B.P.T

(4½ Year Degree Course)

Regulations & Curriculum

(In force for the students from Academic year 2017-2018 and thereafter)
2. The graduate will utilize critical inquiry and evidence-based practice to make clinical decisions essential for autonomous practice.
3. The graduate will function as an active member of professional and community organizations. The graduate will be a service-oriented advocate dedicated to the promotion and improvement of community health.
4. The graduate will demonstrate lifelong commitment to learning and professional development.
CRITERIA OF ELIGIBILITY FOR ADMISSION

- A candidate applying for the degree of B.P.T being eligible for admission to the Physiotherapy College affiliated to UGC recognized University must have passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board and passed in Physics, Chemistry and Biology and English.

Or

- Candidates who have studied abroad and have passed the equivalent examination as per the guidelines of the Association of Indian Universities to determine the eligibility and must have passed in the subjects Physics, Chemistry, Biology, and English up to 12th Standard level.

- He/She has attained the age of 17 years as on 31st December of concerned year.

- He/she should furnish at the time of submission of application form, a certificate of Physical fitness from a registered medical practitioner that the candidate is physically fit to undergo Physiotherapy course.

- A candidate fulfilling above requirement will be provisionally admitted in the First Year of B.P.T Degree Programme as per the rules of Admission Committee for Professional Medical Educational Council of India and/or Government of Gujarat.

DURATION OF COURSE:
B.P.T is 4½ years regular & full time degree programme. The 4½ years includes 4 years and 6 months (minimum 1100 hours) of internship.

MEDIUM OF INSTRUCTION:
English shall be the medium of instruction for all the subjects of study and for examination of the course.

ADMISSION TO THE PROGRAMME:
Admission granted by the Central Admission Committee appointed by the State Government to any student shall be provisional till the Enrollment/Registration/Enlistment is made by the University, and in case of admission is granted on the basis of provisional eligibility certificate, the condition & instruction given by the University should be complied within the time limit fixed by the University, otherwise term kept and fees paid by such a student will be forfeited and fees will not be refundable in any conditions.
Registration: Candidate admitted to the course in any of the affiliated college shall register with University by remitting the prescribed fees along with the application form for registration duly filled in and forwarded to University through Head of the Institute within stipulated date.

RE-ADMISSION AFTER BREAK OF STUDY:
All re-admissions of candidates are subject to the approval of the Vice Chancellor of concerned University.

COMMENCEMENT OF THE COURSE -
The course shall commence as per the notification of Central Admission Committee of Government of Gujarat. No student can be admitted in college after 31st October.
Duration of first term - 1st September to 28th February
Duration of second term - 1st March to 31st August

SCHEDULE OF EXAMINATION
The scheme of examination in the B.P.T course shall be divided into 4 professional examinations; each examination will be held at the end of each respective Academic year.
There will be 1 internal examination (optional) after completion of 4 months of onset of Academic year. There will be 1 summative exam (compulsory) before University exam. Internal evaluation is based on continuous assessment, for 20% of the marks of the subject. There will be University examination through written paper and/or practical examination for 80% of the marks of the subject at the end of every Academic year.

ELIGIBILITY CRITERIA TO APPEAR IN UNIVERSITY EXAMINATION
Attendance: A candidate must secure minimum 75% of attendance
A candidate is required to attend at least 75% of the total classes conducted in a year in all subjects prescribed for that year (separately), in theory and practical / clinical to become eligible to appear for the University examination.
No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc. Condone of shortage of attendance rests with the discretion of Vice-Chancellor.

Filling of University examination form: Candidates desirous of appearing for University examination must forward their applications in the prescribed form to the registrar through the Principal of the Institutions on or before the date prescribed for the purpose
STUDENTS' ASSESSMENT:
The performance of every student in each course will be evaluated as follows:
Internal evaluation based on continuous assessment, for 20% of the marks of the subject;
University examination through written paper and/or practical examination for 80% of the marks of the subject

### SCHEME OF EXAMINATION: SUBJECTS AND DISTRIBUTION OF MARKS

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Subject</th>
<th>First Year B. Physiotherapy</th>
<th>Second Year B. Physiotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Theoretical Marks</td>
<td>Practical Marks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>External</td>
<td>Internal</td>
</tr>
<tr>
<td>1</td>
<td>Human Anatomy</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Human Physiology + Biochemistry</td>
<td>55+25</td>
<td>14+6</td>
</tr>
<tr>
<td>3</td>
<td>Psychology + Sociology</td>
<td>40+40</td>
<td>10+10</td>
</tr>
<tr>
<td>4</td>
<td>Exercise Therapy - 1</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Biomedical Physics (Fundamentals of Electrotherapy)</td>
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<table>
<thead>
<tr>
<th>Sr No</th>
<th>Subject</th>
<th>Theory Marks</th>
<th>Practicals Marks</th>
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<tr>
<td></td>
<td></td>
<td>External</td>
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<td>External</td>
</tr>
<tr>
<td>1</td>
<td>Pathology + Microbiology</td>
<td>40+40</td>
<td>10+10</td>
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<tr>
<td>2</td>
<td>Pharmacology</td>
<td>40</td>
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<tr>
<td>3</td>
<td>Exercise therapy II</td>
<td>80</td>
<td>20</td>
<td>80</td>
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<tr>
<td>4</td>
<td>Kinesiology</td>
<td>80</td>
<td>20</td>
<td>-</td>
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<tr>
<td>5</td>
<td>Orthopedics (traumatic and non-traumatic)</td>
<td>80</td>
<td>20</td>
<td>-</td>
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<td>6</td>
<td>Electrotherapy</td>
<td>80</td>
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### Third Year B. Physiotherapy

<table>
<thead>
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<td></td>
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</tr>
<tr>
<td>1</td>
<td>Medicine I (General Med + Skin &amp; V.D.)</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(55+25)</td>
<td>(15+5)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Medicine II (Neurology + Pediatrics)</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(55+25)</td>
<td>(15+5)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Surgery + Obstetrics and Gynecology</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(55+25)</td>
<td>(15+5)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Physical &amp; Functional Diagnosis</td>
<td>80</td>
<td>20</td>
<td>200</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Psychiatry</td>
<td>40</td>
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<tr>
<td>6</td>
<td>Allied Therapeutics</td>
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### Final Year B. Physiotherapy

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>External</td>
<td>Internal</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Physiotherapy in Neurological Conditions</td>
<td>80</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>Physiotherapy in Musculoskeletal Conditions</td>
<td>80</td>
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<td>200</td>
</tr>
<tr>
<td>3</td>
<td>Physiotherapy in Cardiorespiratory Conditions</td>
<td>80</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td>4</td>
<td>Physiotherapy in General Medical &amp; Surgical Conditions</td>
<td>80</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td>5</td>
<td>Community based Rehabilitation &amp; Ethics + Bio-Engineering</td>
<td>80</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40+40)</td>
<td>(10+10)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Biostatistics &amp; Research</td>
<td>40</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

### Internal Assessment:

The internal assessment will be done based on continuous evaluation method. Every year, there is one internal examination for both the theory and the practical. For the award of internal marks in theory and practical, other components like attendance, seminar presentations, workshops & conferences attended and journal submission will also be taken into consideration.

**Internal marks calculation - 20% of total Marks of a subject (Separately for theory and practical):**

**Distribution of 20% of Marks is as follows:**

- Internal examinations (Both theory &/or Practical of subject whatever is applicable): 10 % of total marks
> Attendance: 5% of total marks (1 mark for >75% to 80%, 2 marks for >80% to 85%, 3 marks for >85% to 90%, 4 marks for >90% to 95%, 5 marks for >95% to 100%)
> Seminar presentations, workshops & conferences attended and journal submission or discipline: 5% of total marks

A candidate must obtain minimum of 35% marks of internal evaluation in each paper for both theory and practical separately before appearing for University examination.

UNIVERSITY (EXTERNAL) EXAMINATION:
PASSING CRITERIA: Every student should have an aggregate score of minimum 50% marks of combined in both the Internal and University Examination but separately in theory and practical examination. It is not compulsory to pass in section – I and section – II separately.

STRUCTURE OF QUESTION PAPERS:

<table>
<thead>
<tr>
<th>Paper Style for 80 marks subject for University (External) examination</th>
<th>Marks</th>
<th>(Any _ out of _ Each)</th>
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<tbody>
<tr>
<td>Duration: 3 Hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section I</td>
<td>Que. 1 Long Answer</td>
<td>1 x 10 = 10</td>
</tr>
<tr>
<td>Section I</td>
<td>Que. 2 Short Answer</td>
<td>3 x 05 = 15</td>
</tr>
<tr>
<td>Section I</td>
<td>Que. 3 Very Short Answer</td>
<td>5 x 03 = 15</td>
</tr>
<tr>
<td>Section II</td>
<td>Que. 4 Long Answer</td>
<td>1 x 10 = 10</td>
</tr>
<tr>
<td>Section II</td>
<td>Que. 5 Short Answer</td>
<td>3 x 05 = 15</td>
</tr>
<tr>
<td>Section II</td>
<td>Que. 6 Very Short Answer</td>
<td>5 x 03 = 15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit (Section I)</th>
<th>Unit (Section II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Anatomy</td>
<td></td>
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<tr>
<td>Exercise Therapy – I</td>
<td></td>
</tr>
<tr>
<td>Psychology (Section I) &amp; Sociology (Section II)</td>
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<tr>
<td>Exercise therapy II</td>
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<tr>
<td>Kinesiology</td>
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<td>Physiotherapy in Neurological Conditions</td>
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<td>Physiotherapy in Musculoskeletal Conditions</td>
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<tr>
<td>Physiotherapy in Cardiopulmonary Conditions</td>
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<tr>
<td>Physiotherapy General Medical &amp; Surgical Conditions</td>
<td></td>
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<tr>
<td>Community based Rehabilitation &amp; Ethics</td>
<td></td>
</tr>
</tbody>
</table>
Paper-style for 80 marks subject for University (External) examination (including section I for 55 marks and section II for 25 marks)

Duration: 3 Hours

Section I:
Que. 1 Long Answer \(2 \times 10 = 20\) (Any 2 out of 3)
Que. 2 Short Answer \(4 \times 05 = 20\) (Any 4 out of 5)
Que. 3 Very Short Answer \(5 \times 03 = 15\) (Any 5 out of 6)

Section II:
Que. 4 Long Answer \(1 \times 10 = 10\) (Any 1 out of 2)
Que. 5 Short Answer \(1 \times 05 = 05\) (Any 1 out of 2)
Que. 6 Very Short Answer \(5 \times 02 = 10\) (Any 5 out of 6)

Applicable for following subjects:
- Human Physiology (Section I) & Biochemistry (Section II)
- Medicine I (General Med + Skin & V. D.)
- Medicine II (Neurology + Pediatrics)
- Surgery + Obstetrics and Gynecology

Paper-style for 40 marks subject for University (External) examination (including section I only)

Duration: 2 Hours

Section I:
Que. 1 Long Answer \(1 \times 10 = 10\) (Any 1 out of 2)
Que. 2 Short Answer \(3 \times 05 = 15\) (Any 3 out of 4)
Que. 3 Very Short Answer \(5 \times 03 = 15\) (Any 5 out of 6)

Applicable for following subjects:
- Biomedical Physics (Fundamentals of Electrotherapy)
- Pharmacology
- Psychiatry
- Allied Therapeutics
- Biostatistics & Research

GENERAL INSTRUCTIONS FOR UNIVERSITY PRACTICAL EXAMINATION

1. Practical examination should be taken and marks should be given by pair of examiners only and not by single examiner.
2. Marks should be put directly on the mark sheet. No rough mark sheet should be used.
3. Sealed original and duplicate mark sheets should be submitted at the end of EACH SESSION to the special supervisor or co-coordinator of examination.
4. Examiner shall not keep any kind of rough or fair copy of any mark sheet with him/her.
5. Number of students per examiner examined per day should not exceed 30 in any circumstances.
REVIEW OF ANSWER PAPERS OF FAILED CANDIDATES
As per the regulations prescribed for review of answer papers by the University

INTERNAL EVALUATION FOR REPEATERS:
A candidate who has been declared fail in University examination for either of 1st, 2nd, 3rd, 4th year B.P.T is a repeater for said examination/paper/subject.

The eligibility criteria for appearing for University examination shall be applicable for the repeaters. But, the candidate may appear for the theory and practical held during that Academic year, for the improvement of internal marks for the subsequent University examination in the paper/papers he/she has failed. If candidate does not wish to appear in repeat internal examination, marks obtained in previous internal examination will be counted as final marks.

PROMOTION CRITERIA / CARRY OVER SYSTEM:

i. It is not mandatory to pass in 1st year B.P.T Examination to proceed to 2nd year B.P.T class. However, it is mandatory to pass in all subjects of 1st year B.P.T examination to be eligible to appear for 2nd year B.P.T examination.

ii. It is not mandatory to pass in 2nd year B.P.T Examination to proceed to 3rd year B.P.T class. (Students can be allowed to attend classes in 3rd B.P.T only if he/she has passed 1st B.P.T University exam.) However, it is mandatory to pass in all subjects of 2nd year B.P.T examination to be eligible to appear for 3rd year B.P.T examination.

iii. It is not mandatory to pass in 3rd year B.P.T Examination to proceed to 4th year B.P.T class. (Students can be allowed to attend classes in 4th B.P.T only if he/she has passed 2nd B.P.T University exam.) However, it is mandatory to pass in all subjects of 3rd year B.P.T examination to be eligible to appear for 4th year B.P.T examination.

iv. A candidate cannot be declared to have passed the examination until he/she has passed in all the subjects in that particular examination.
GRACE MARKS:
The Grace Marks may be awarded by the University to a student, who has failed in any paper, either theory or practical; but it is a subject to discretion of the Vice Chancellor.

DEFINITION OF TRIAL/ATTEMPT
First trial/attempt is deemed to take place when the candidate is due to appear as per the regulation of University for the examination. Similarly 2nd, 3rd, etc, trials relating to subsequent examination.

EXEMPTION FROM RE-EXAMINATION:
Candidates who have failed in the examination, but obtained pass marks in any subjects shall be exempted from re-examination in those subjects.

DECLARATION OF CLASS:
A successful candidate -
1. Who secures 75% and above in the aggregate marks shall be declared to have secured ‘FIRST CLASS WITH DISTINCTION’ provided he/she passes the whole examination in the FIRST ATTEMPT;
2. Who secures above 60% and less than 75% in the aggregate marks shall be declared to have passed the examinations in the ‘FIRST CLASS’, provided he/she passes the whole examination in the FIRST ATTEMPT;
3. Who secures above 50% and less than 60% in the aggregate marks shall be declared to have passed the examinations in the ‘SECOND CLASS’; provided he/she passes the whole examination in the FIRST ATTEMPT;
4. All other successful candidates who passed the examination in more than first/one attempt shall be declared to have PASS CLASS; irrespective of percent of marks secured.

COMPULSORY ROTATORY INTERNSHIP
All students of Bachelor of Physiotherapy must undergo a compulsory rotatory internship for a period of 6 months after passing 4th year BPT examination in all subjects. It includes Minimum 1100 hours. Candidate will have to join internship within 15 days of declaration of 4th year University examination result. Internship should be done in only Hospitals/Institutions recognized by the Council (List will be declared later). No candidate shall be awarded degree certificate without successfully completing six months of Internship.
The Internship should be rotatory and cover clinical branches concerned with Physiotherapy such as Orthopedics, Cardiothoracic including ICU, Neurology, Pediatrics, General Medicine, General Surgery, Obstetrics and Gynecology both in-patient and out-patient services. On completion of all postings, the duly completed logbooks will be submitted to the Principal/Head of program to be considered as having successfully completed the internship program.

**DRESS CODE:**
Professionalism with respect to dressing is encouraged throughout the course. It is each student’s responsibility to have appropriate dressing during all class assignments and learning activities. Students are supposed to wear apron compulsorily during practical and clinical hours.

**MIGRATION/TRANSFER OF CANDIDATES:**
The Vice Chancellor shall have the powers to place any migration/transfer he/she is fit for grant of permission for migration/transfer to candidates undergoing course of study in another University as prescribed by University.
# COURSE OF STUDY - SUBJECTS & HOURS DISTRIBUTION

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Subject</th>
<th>Theory Hours</th>
<th>Practical Hours</th>
<th>Total Hours</th>
</tr>
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<tbody>
<tr>
<td></td>
<td><strong>First Year B: Physiotherapy</strong></td>
<td></td>
<td></td>
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<tr>
<td>1</td>
<td>Human Anatomy</td>
<td>125</td>
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<td>Human Physiology</td>
<td>170</td>
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<td>220</td>
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<tr>
<td>3</td>
<td>Biochemistry</td>
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<td>4</td>
<td>Psychology</td>
<td>60</td>
<td>-</td>
<td>60</td>
</tr>
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<td>5</td>
<td>Sociology</td>
<td>60</td>
<td>-</td>
<td>60</td>
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<td>6</td>
<td>Exercise Therapy – 1</td>
<td>175</td>
<td>100</td>
<td>275</td>
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<td>7</td>
<td>Biomedical Physics (Fundamentals of Electrotherapy)</td>
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<td>-</td>
<td>100</td>
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<tr>
<td>8</td>
<td>Computer (Non-exam)</td>
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<td>40</td>
<td>100</td>
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<td>9</td>
<td>English (Non-exam)</td>
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<td>10</td>
<td>Environment Studies (Non-exam)</td>
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<td>50</td>
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<td>Clinical (Introductory only)</td>
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<tr>
<td></td>
<td>Revision and Prelim Exam</td>
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<td><strong>Total</strong></td>
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<td><strong>Second Year B: Physiotherapy</strong></td>
<td></td>
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<tr>
<td>1</td>
<td>Pathology</td>
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<td>Microbiology</td>
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</tr>
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<td>3</td>
<td>Pharmacology</td>
<td>50</td>
<td>-</td>
<td>50</td>
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<tr>
<td>4</td>
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<td>150</td>
<td>100</td>
<td>250</td>
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<td>Kinesiology</td>
<td>100</td>
<td>-</td>
<td>100</td>
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<td>6</td>
<td>Orthopedics Traumatic</td>
<td>60</td>
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<td>7</td>
<td>Orthopedics Non traumatic</td>
<td>60</td>
<td>-</td>
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<td>8</td>
<td>Electrotherapy</td>
<td>175</td>
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<td>E.N.T. (Non-exam)</td>
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<td>Clinical</td>
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<td>Revision and Prelim Exam</td>
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6-month compulsory rotatory internship: 1065 Hours
COURSE CONTENTS

FYB Physiotherapy

OBJECTIVES:
At the end of the course, the student will be able to:
1) Acquire the knowledge of structure of human body in general.
2) Understand the regional anatomy in detail
3) Anatomical changes right from embryonic period till old age
4) Understand histological features of various organs
5) Understand its application in medical science

1. HUMAN ANATOMY – (300 Hours)

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| 5   | ⅓ | DIGESTIVE SYSTEM |
| 6   | ⅔ | URINARY SYSTEM |
| 7   | ⅔ | ENDOCRINE SYSTEM |
| 8   | ⅔ | REPRODUCTIVE SYSTEM |
| 9   | ⅔ | SPECIAL SENSORY ORGANS AND SENSATIONS  |
| 10  | ⅔ | CARDIOVASCULAR SYSTEM (Heart &amp; Vessels) |
| 11  | ⅔ | HISTOLOGY |
| 2/11| ⅔ | Cell |
| 3/11| ⅔ | Epithelia |
| 4/11| ⅔ | Connective tissue (general) |</p>
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<td>Development of alimentary muscular system</td>
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<td>Development of locomotor system</td>
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<td>Development of nervous system</td>
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13 | COVERED IN SYSTEM |

125 175 300

Note: -
1. Dissection of upper and lower limbs & back.
2. Identification of anterolateral abdominal wall, posterior abdominal wall & thoracic cage.
3. Anatomical position & description of all bones.
4. Surface marking in cadaver and living body.
5. Radiological examination of upper limb, lower limb & other special X-rays.
6. In BRAIN: Identification of all parts and various sections at different levels.
2. HUMAN PHYSIOLOGY (220 Hours)
(The topics are distributed into hours as following)

Total of hours of theory = 170
1. General Physiology 10 Hours
2. Blood 15 Hours
3. Cardio Vascular System 20 Hours
4. Digestive Systems 10 Hours
5. Respiratory System 15 Hours
6. Nutrition 05 Hours
7. Endocrines 20 Hours
8. Reproductive System 10 Hours
9. Excretory System 05 Hours
10. Nerve 10 Hours
11. Muscle 10 Hours
12. Central Nervous System 30 Hours
13. Special Senses 10 Hours

Objectives:
At the end of the year the student will be able to:
1) Acquire the knowledge of functions of various systems of human body
2) Understand the role of hormones, enzymes and other different types of cells of human body.

1. General Physiology:
2. General Principles of Biophysics

2. Blood:
2. Structure, formation and functions of R.B.C.
3. Structure, formation and functions W.B.Cs. and Platelets.
4. Coagulation and its effects on bleeding, clotting time.
5. Blood groups and their significance, Rh. factor.
6. Reticulo-Endothelial system, jaundice, structure and functions of spleen.
7. Haemoglobin and E.S.R.

3. Cardiovascular System:
1. Structure, properties of heart muscle and nerve supply of heart, Structure and function of arteries, arterioles, capillaries and veins.
2. Cardiac cycle and heart sounds.
3. Cardiac output measurement & affecting factors
4. Heart rate and its regulation, cardio vascular reflexes.
5. Blood pressure, its regulations and physiological variations.
6. Peripheral resistance, Factors controlling, Role in B.P.
4. Respiratory System:
1. Mechanism of respiration, intra-pleural and intra pulmonary pressure.
2. Lung volumes and capacities.
3. O2 and CO2 carriage and their exchange in tissues and lungs.

5. Digestive System:
1. General outline and salivary digestion
2. Gastric secretion and its mechanism of secretion and functions.
3. Digestion, absorption and metabolism of proteins.
4. Structure, Secretions and Functions of Livers.

6. Nutrition:
1. Digestion, absorption and metabolism of carbohydrates.
2. Digestion, absorption and metabolism of fats.
3. Digestion, absorption and metabolism of proteins.
4. Vitamins, sources, functions and resources.
5. Balanced diet in different age groups and occupation.

7. Endocrines:
1. Anterior Pituitary.
2. Posterior Pituitary and parathyroid.
3. Thyroid.
4. Adrenal Cortex.
5. Adrenal Medulla, thymus.

8. Reproductive System:
1. Sex determination and development, puberty.
4. Pregnancy, functions of placenta and teratogens.

9. Excretory System:
3. Renal function tests.
4. Physiology of micturition.

10. Neuro Muscular Physiology:
A. Muscle And Nerve:
1. Structure of neurones, membrane potential and generation of action potential.
3. Nerve muscular junction and drugs acting on it - Myasthenia.
4. Degeneration and regeneration in peripheral nerves including Wallerian degeneration.
B. Muscle:
1. Type of muscles and their gross structure, stimulus, chronaxie, strength duration curve.
2. Structure of Sarcomere - basis of muscle contraction, Starling's law, changes during muscle contraction.
3. Electrical - Biphasic and monophasic action potentials.
4. Chemical, Thermal and Physical changes, isometric and isotonic contraction.
5. Motor units and its properties, clonus, tetanus, all or none law, beneficial effect.

11. Nervous System:
1. Types and properties of receptors, types of sensations
2. Structure of synapse, reflex arc and its properties, occlusion, summation, sub minimal fringe etc.
3. Tracts of spinal cord.
4. Descending tracts, Pyramidal and Extrapyramidal.
5. Hemi section and complete section of spinal cord. Upper and lower motor neuron paralysis.
6. Cerebral cortex, areas and functions - E.E.G.
7. Structure - connections and function of cerebellum.
8. Basal ganglia and thalamus, connections and functions.
9. Reticular formation, tone, posture and equilibrium.
10. Autonomic Nervous System.

12. Special Senses:
1. Broad features of eye, errors of refraction, lesions of visual pathways.
2. Speech and its disorders.
3. Ear and vestibular apparatus.

Practical & Demonstrations: (50 Hours)

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<td>2  Action Potential etc.</td>
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<td>3  Effect of Temperature on S.M.C</td>
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<td>14  Blood grouping Bleeding time/Clotting Time, Blood, PCV, ESR</td>
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3. BIO-CHEMISTRY

Objectives:
At the end of the course the candidate will be able to
1. Describe the structure and function of the cell in brief.
2. Describe the normal functions of different components of food.
3. Describe basal metabolic rate and the factors affecting the same (in brief) with special reference to obesity.
4. Discuss nutritional aspects of carbohydrates, lipids, proteins, vitamins and minerals and their metabolism with special reference to diabetes.
5. Define enzymes and discuss in brief the factors affecting enzyme activity and diagnostic use of enzymes.
6. Describe in detail the biochemical aspects of muscle contraction.
7. Acquire knowledge in brief about the fundamentals of chemistry with special reference to liver and renal function tests, blood study for simple tests, the metabolism of fat, carbohydrates, proteins, bone minerals, electrolyte balance, water balance and acid – base balance.

Content:
1. Biochemical characteristics of human body.
2. Biochemistry, morphology of cell.
4. Proteins.
5. The enzymes.
6. Metabolism.
13. Common procedures used in biochemistry.

4. PSYCHOLOGY

Objectives:
At the end of the course the candidate will be able to
1. Define the term psychology and its importance in the health delivery system and gain knowledge of psychological maturation during human development and growth and alteration during ageing process.
2. Understand the importance of psychological status of the person in the health and diseases, environmental and emotional influence on the mind and personality.
3. Acquire the knowledge as to how to deal with the patient.

Reference should be made whenever appropriate to the therapist's relationship with the patient and with his professional colleagues. Emphasis should be laid on the effects of disease on the patient's behaviour.

1. **Introduction**: Introduction of psychology, brief history, definitions, schools of psychology.
2. **Biological foundations of behaviour**: hereditary, environment and logical basis for development, developmental psychology (child).
3. **Learned and unlearned behaviour**: Simple learning and conditioning, social learning, Learning disability in children (counselling for exercise).
4. **Memory**: Phases of memory, short term storage, memory and perception thinking etc. Forgetting testimony and recall of events, memory and ageing.
5. **Perception**: Sensory basis of perception, attention and perception, observer error.
6. **Motivation and Emotions**: Approaches to motivations, emotional development, influence of early experience, family and social influences on motivation and behaviour. Thematic apperception test developed by A M Mankad based on Maslow theory.
7. **Thinking and Intelligence**: Learning and problem solving, development of conceptual thinking in children. Communication, language and thinking. Measurement of intelligence, influences on intelligence, extent and consequence of individual difference.
8. **Tests**: Wechsler scales, Stanford-Binet Intelligence scale, Bender, and Gestalt - other projective test, Anxiety scale.
9. **Personality**: nature of personality structure and dynamics, dimensional, psycho analytical and constitutional theories of personality, measurement of personality, culture and personality patterns.
10. **Attitude**: Nature of attitudes and beliefs including prejudice, group influences on attitudes, attitude change, doctor-patient expectations and attitudes, prejudice formation and reduction.
11. **Interpersonal Behaviour**: Experimental analysis on social interaction, studies of the interview situation, behaviour in formal and informal groups, group norms and roles. Leadership in formal and informal groups, group moral, Behaviour therapy, behaviour modification techniques, token economy.
12. **Social Psychology**: nature and scope of social psychology, social interaction, psychological groups and their classification, socialization of the individual, social control (social heredity) - moves, customs, fashion, propaganda and its techniques.
13. **Stress**: stress and responses, disorders, coping with stressors, four maxims, meditational yoga.
14. **Pain**: Physiological and psychological factors, types of pain, pain measurement.
5. SOCIOLOGY

Objectives:
At the end of the course the candidate will be able to
1. Define the term sociology and its importance in the health delivery system.
2. Understand the basic sociological concepts, principles and social process, social institution in relation to the individual family and community and the various social factors affecting the family in the rural and urban communities in India.

The subject will introduce the student to the basic sociological concepts, principles and social processes, social institutions in relation to the individual family and community and the various social factors affecting the family in rural and urban communities.

1. Introduction:
1. Meaning - Definition and scope of sociology.
2. Its relation with anthropology, psychology, social psychology and ethics.
3. Methods of sociology - Case study, social survey, questionnaire, interview and opinion poll methods.
4. Importance of its study with special reference to health care professionals.

2. Social factors in Health and Disease:
The meaning of social factors - The role of social factors in health and illness.

3. Socialization:
1. Meaning and nature of socialization.
2. Primary, secondary and anticipatory socialization.
3. Agencies of socialization.

4. Social Groups:
Concepts of social groups influence of formal and informal groups on health and sickness.
The role of primary groups and secondary groups in the hospital and rehabilitation settings.

5. Family:
1. The family
2. Meaning and definition
3. Functions
4. Types
5. Changing family patterns
6. Influence of family on the individuals health, family and nutrition, the effects of sickness on family and psychosomatic disease and their importance to physiotherapy.

6. Community:
1. Rural community - Meaning and features - Health hazards of ruralities.

7. Culture and Health:
1. Concept of culture
2. Culture and behaviour.
3. Cultural meaning of sickness.
4. Culture and health Disorders
8. Social Change:
1. Meaning of social changes.
2. Factors of social change.
3. Human adaptation and social change.
5. Social change and deviance.
7. The role of social planning in the improvement of health and in rehabilitation.

9. Social Problems of Disabled:
Consequences of the following social problems in relation to sickness and disability remedies to prevent these problems.
2. Poverty and unemployment.
5. Prostitution.
6. Alcoholism.
7. Problems of women in employment.

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

11. Social Worker:
Meaning of social work. The role of a medical social worker.

6. EXERCISE THERAPY I & MASSAGE MANIPULATION

Objectives:
At the end of the year the student will be able to
1. Understand the basic mechanical principles and effect of exercise, therapeutic modality in the restoration of physical function.
2. Describe and acquire the skills of application and demonstration of the use of various tools of the therapeutic gymnasium and various starting and derived positions.
3. Describe the physiological and therapeutic effect of various movements and demonstrate in various anatomical planes.
4. Acquire the skills of application of various massage manipulations and describe the physiological effects, therapeutic uses, merits – demerits of the same.
5. Demonstrate and acquire the skill of relaxation.

1. Introduction to exercise therapy.
2. Physiological effects and uses of exercise.
3. Pharmacological aspects of exercises.
4. Use of apparatus in exercise therapy.
5. Fundamental starting positions, derived positions-effects and uses, pelvis tilt & Muscle work for all positions.
6. Joint movement - terminology and range axes and planes of movement, levers, measurement of joint movements, goniometry, types of goniometer, bubble and gravity goniometer.

7. Causes of restriction of range of movement - distinguish between skin, muscles, capsular contractures.

8. Classification of movements

9. Active movements - Definition, types, techniques, effects and uses. Passive movements - Definition, types, techniques of relaxed passive movements and uses, comparison of both movements.

10. Group work - Criteria of selection of patients, advantages and disadvantages of group class exercises.


12. Suspension therapy - definitions of suspension and point of suspension, types of suspension, pulleys and use of pulleys in suspension therapy, application of suspension therapy either to increase the joint range or to increase muscle power.


15. Normal gait cycle - Phases of cycle.

16. Crutch walking - Types of crutch walking. Use of parallel bars in pre-crutch walking stage, balance exercises, phase of walking - gait training, group of muscles responsible during crutch walking.

17. Progression in crutch walking, measurement of crutches, other walking aids canes, walkers, tripods, other types of crutches. - crutch - walking on uneven surface, slopes, climbing up the stair case.


19. Application of resistance to develop endurance and power, progression of exercises, angle of pull, types of muscle work exercises - free resisted, assisted - use of gadget apparatus. Resisted Exercises - Techniques and types of resistance, SET system (Heavy resisted exercises) Oxford method, Delorme method, isometric method.

20. Free Exercises - Classification, technique, effects of free exercises - application for shoulder, neck, hip and knee joints, techniques of mobilization for stiff joints.


**SOFT TISSUE MANIPULATION-MASSAGE MANIPULATION**

1. Introduction - brief history, definition, classification.

2. Physiological effects and therapeutic uses, contra-indications.

3. Preparation of patient, basic points to be considered before and during massage procedure.

4. Technique, effects and uses of each manipulation and contra-indications.

5. Specific effects of certain manipulations.

6. Massage for arm, leg, neck and upper back face.

7. Massage for oedema, scar, tendinitis, fibrosis (tight fascia).

8. Practice of soft tissue manipulation in subjects.

7. FUNDAMENTALS OF ELECTROTHERAPEUTICS & BIOMEDICAL PHYSICS

Objectives:
At the end of the course the candidate will be able to:

1. Recall the physics principles & Laws of Electricity, Electro-magnetic spectrum & ultrasound.
2. Describe effects of environmental & man made electro-magnetic field at the cellular level & risk factors on prolonged exposure.
3. Describe the main electrical supply, electric shock — precautions.
4. Enumerate types & production of various therapeutic electrical currents. Describe the panel diagrams of the machines.
5. Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc & the simple instruments used to test / calibrate these components (such as potentiometer, oscilloscope etc) of the circuitry; & will be able to identify such components.
6. Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.
7. Acquire knowledge of various superficial thermal agents such as Paraffin wax bath, cryotherapy, homemade remedies, etc; their physiological & therapeutic effects, merits / demerits; & also acquire the skill of application.

1. Main Supply: Production of Electricity: Types, Distribution, Earthing, Types of Plugs & Switches, Fuse.
5. Condenser: Principles, Capacity (Measurement and factors determining), Types and Construction, Electric field, Charging and discharging of the condenser, Duration of discharge through inductance, capacitive reactance and uses of condenser.
6. DC: Sources-Cell and rectified AC. Rectification of AC: Thermionic Valves (Diode and Triodes) Metal rectifier, Types of rectification (Half and full wave – Voltage halving and Westinghouse bridge)
10. Direction of Induced EMF, Strength of induced EMF, Types (Self and Mutual) and inductive reactance. Eddy Currents.
11. Dynamo Transformers (Functions, Types, Constructions),
12. Choke coil (Types and functions).
13. Electrical Skin Resistance: Electrode Used, electrode Gels
Reflection, Refraction, Absorption, Attenuation, Cosine law, Inverse square law.
Grothus law etc.
15. Physiology of Pain.

8. COMPUTER APPLICATIONS
(Not for University Exam)

The course enables the students to understand the fundamentals of computer and its basic
applications.

1. Introduction to data processing:
- Features of computers. What are Hardware and Software?
- Advantages of using computers. Role and uses of computers. What is data processing?
- Application areas of computers and common activities in data processing. Types of data
  processing, characteristics of application.

2. Hardware concepts:
- Architecture of computers – characteristics of mice, keys, terminals, printers, network.
- Types of storage devices.
- Concept of damage. Application of networking concepts, PCC system care, floppy care, data
care etc.

3. Concept of software
- Classification of software, System software, Application of software, Operating System,
  Computer System, computer virus, protection against viruses, dealing with viruses,
  computers in medical electron.

4. Basic anatomy of Computers:
- Principles of programming: Computer application. Principles in scientific research, work
  processing, medicine, libraries, museum, education, information system.
- Data processing
- Computers in Physical Therapy, Principles of EMG, Exercise testing equipment, Laser.

9. ENGLISH
(Not for University Exam)

Course Outline: The course is designed to help Acquire a good command and comprehension
of the English language through individual papers and conferences.

1. Introduction:
- Study techniques
- Organization of effective note taking and logical processes of analysis and synthesis.
- Use of the dictionary
- Enlargement of vocabulary
- Effective dictation

2. Applied Grammar:
- Correct usage
- The structure of sentences
- The structure of paragraphs
3. Written composition:
   - Precise writing and summarizing
   - Writing of Bibliography
   - Enlargement of vocabulary

4. Reading and Comprehension:
   - Review of selected materials and express oneself in one’s words and enlargement of vocabulary.

5. The study of various forms of composition:
   - Paragraph, essay, letter, summary, practice in writing

6. Verbal Communication:
   - Discussions and summarization, debates, oral reports, use in teaching.

10. ENVIRONMENTAL SCIENCES (50 HOURS)
    (Not for University Exam. Only for Internal Exam)

Syllabus as described by University Grant Commission

SECOND YEAR B. PHYSIOTHERAPY

1. PATHOLOGY

Objectives:
At the end of the course the candidate will be able to:

1. Acquire the knowledge of concepts of cell injury and changes produced thereby in different tissues and organs, capacity of the body in healing process.
2. Recall the etio-pathogenesis, the pathological effects and the clinical-pathological correlation of common infection and non-infectious disease.
3. Acquire the knowledge of concepts of necropathia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
4. Correlate normal and altered morphology of different organ systems in different diseases needed to understand the disease process and their clinical significance (with special emphasis to neuro-musculo skeletal and cardiovascular – respiratory system).
5. Acquire knowledge of common immunological disorders and their resultant effects on the human body.
6. Understand in brief, about the hematological diseases and investigations necessary to diagnose them and determine their prognosis.

General Pathology:
1. Introduction: Aims and objects of study of pathology, definitions of health, disease, causes of disease, methods of study of disease.
2. Inflammation – General morphology, types, phenomenon of acute inflammation.
3. Tissue repair – Wound healing, fracture, skin, nerves, muscles
4. Cell Injury – Degeneration, physical and chemical irritants, ionizing radiations,
cellulites.
6. Necrosis, Gangrene
8. Cellular ageing
9. Tumors – definitions, classification, characteristics of being and malignant tumors, etiology and spread of tumors, systemic effects.
10. Infection – Acute, chronic, including AIDS.
11. Blood-Anemia, definition, classification, etiology, lab investigations, blood picture; Hemorrhagic disorders – causes and classification (hemophilia)
12. Immunity and Hypersensitivity

Systemic Pathology:
(Each condition in this section is to be taught under the specific headings of Causes, Development, Gross and Microscopic only):
1. Respiratory System: Pneumonia, Bronchitis, Bronchiectasis, Asthma, Emphysema, Tuberculosis and Carcinoma of Lungs Occupational Lung Diseases
2. Cardiovascular System: Rheumatic Heart diseases, Myocardial infarction, Atherosclerosis and other disease of blood vessels – TAO, Buerger’s diseases, Thrombophlebitis, Congenital Heart diseases
3. Alimentary System: Peptic Ulcers, Ulcers in Stomach or intestine
4. Liver: Hepatitis, Cirrhosis
5. CNS: Meningitis, Encephalitis, Cerebral Hemorrhage, CVA, Brief outline of CNS Tumors
7. Bones and Joints: Osteomyelitis, Osteoarthritis, Septic, Arthritis, Gout, Osteomalacia, Bone Tumors Briefly: Giant Cell tumors, osteosarcoma, Ewing’s
8. Muscles: Disorder of muscles Briefly: Poliomyelitis and Myopathies, Volkman’s ischaemic contracture
9. Skin: Scleroderma, Psoriasis, Autoimmune disorders
10. Urinary System: Nephritis, Glomerular Nephritis, Nephrotic Syndrome
11. Endocrine System: Thyroid – Thyroiditis and Thyroid tumors, Diabetes

2. MICROBIOLOGY

Objectives:
At the end of the course the candidate will be able to have sound knowledge of the agents responsible for causing human infections pertaining to CNS, CVS, musculoskeletal and Respiratory system.

General Bacteriology:
1. Introduction, historical background, classification of micro-organisms
2. Morphology of bacteria
3. Staining of bacteria
4. Sterilization
5. Cultivation and culture media

Systemic Bacteriology:
1. Gram-Positive cocci – Streptococci, Pneumococci, Staphylococci
2. Gram-Negative Cocci – Gono and Meningo cocci
3. Gram-Positive Bacilli
4. Gram-Negative Bacilli-Typhoid, Cholera, Dysentry
5. Aerobic-Diptheria, T.B., Leprosy
6. Anaerobic-Tetanus, Gas Gangrene, Botulism

Immunology:
1. Immunity, Antigens
2. Antibodies, Ag-Ab Reaction
3. Agglutination, precipitation
4. Hypersensitivity reactions

General Virology:
1. Poliomyelitis
2. Rabies
3. Demonstration of test in diagnosis of AIDS, Hepatitis and Syphilis

Parasitology:
1. Malaria
2. Amoebiasis
3. Round worm and loop worm

Mycology:
1. Candidiasis
2. Ring worm
3. Scabies

Objectives:
At the end of the course the candidate will be able to
1. Describe pharmacological effects of commonly used drugs by patients referred for physiotherapy; list their adverse reactions, precautions to be taken, contraindications, formulation and route of administration.
2. Identify whether the pharmacological effect to the drug interferes with the therapeutic response of physiotherapy and vice versa
3. Indicate the use of analgesics and anti-inflammatory agents with movement disorders, with consideration of cost efficiency and safety for individual needs.
4. Get the awareness of other essential and commonly used drugs by patients. The basis of their use and common as well as serious adverse reaction.
Syllabus:
1. Chemical character and general action of drugs
2. Principles of drug administration and routes of administration, distribution, metabolism, excretion of drugs, factors influencing drug reaction, dosage and factors modifying it.
3. Drug toxicity including allergy and idiosyncrasy.
4. Definition, action, indication, contraindication, adverse reaction of the following:
5. Drugs acting as PNS: stimulating and inhibiting, cholinergic and anticholinergics. Drugs acting at NM junction. Muscle relaxants, alcohol
6. Drugs acting on CNS: Analgesics, antipyretics, narcotics, anti inflammatory, anti epileptic, sedatives, hypnotics, tranquillizers, anticonvulsants, stimulants, psychotherapeutics.
7. Pulmonary effects of general and local anesthetic agents
8. Drugs acting on CVS: antihypertensive, vasoconstrictors, vasodilators, diuretics, mucolytic agents. Drugs that influence myocardial contractility and heart rate.
9. Drugs acting on Respiratory system bronchodilators, drugs used in inhalation therapy, drugs acting on CNS and cardio respiratory system which influence the physical exercise.
10. Antimicrobial Agents
11. Immunological agents and vaccines
12. Chemotherapeutic agents
13. Endocrine Pharmacology: thyroxin, glucocorticoids, anabolic steroids, calcitonin, insulin and hypoglycemics
14. The vitamins
15. Irritants counterirritants, plasters, poultice and pastes

Objectives:
At the end of the course the candidate will be able to
1. Describe the biophysical properties of connective tissue and the effect of biomedical loading and factors which influence the muscle strength and mobility of articular and periarticular soft tissue.
2. Acquire the skill of assessment of isolated and group muscle strength subjectively and objectively.
3. Analyze normal human posture and its associated problems, its management.
4. Analyze the various normal musculoskeletal movements during breathing, gait and daily living activities and in terms of biomechanical and physiological principles.
5. Describe and demonstrate various therapeutic exercise with its technique: including chest P.T. on self and also acquire the skill of application on model.
6. To demonstrate general fitness, exercise and shall gain fitness for oneself

4. Exercise Therapy II
Syllabus

1. Passive movements: Definition, types, technique, effects and uses, CPM unit, comparison of active with passive movements for all joints of extermates, neck and trunk.

   Stretching: Definitions related to stretching, types of contractures and differentiation properties of soft tissues affecting elongation and aims of stretching, manual and mechanical stretching, cycle mechanical stretching, indications and aims of stretching, principles and contraindications, MFR (Myofacial Release)

   Traction: Types, effects, principles of application for cervical and lumbar spine, traction to soft tissues of joints – gliding movements

2. Mobilization: Causes of restriction of R.O.M., prevention of restrictions, techniques of mobilization of various joints of limbs to mobilize joint R.O.M. through functional diagonal patterns, joint mobilization; manipulation-definition, types; joint shapes, types of motion; stretching, glides, compression, traction, indications, contraindications, precautions and conditions for special precautions.

3. M.M.T.: need of M.M.T., uses, fundamental principles, anatomical and physiological basis, Oxford scale of muscle gradation, principles of isolation, substitution, stabilization, grading procedure for muscles of extremities, neck and trunk.

   Voluntary control of movement gradation by Bobath, Brunnstrom.

4. Posture, types, factors influencing posture, regulation of posture and posture mechanism, pelvic tilt and postural deviations of spine and its treatment

   Crawling exercises: principles, types, effects and uses of Clapp’ crawl

5. Strengthening of muscles (RE): Principles involved to prevent muscle wasting, Rood’s technique of initiating muscle contraction, progressive strengthening of muscles (loads assisted and resisted exercises), use of equipments, reeducation of muscles and restoration of functions; practice of strengthening of muscles of limbs, neck, trunk and face, emphasis on hand and foot muscles, quadriceps, glutei, triceps, deltoid and face muscles, use of animal and mechanical resistance, contraindications, isometric and isokinetic exercises regime, plyometrics, MET (Muscle Energy Techniques)

6. Proprioceptive Neuromuscular Facilitation: Introduction, responses of NM mechanism, basis techniques of PNF patterns of arm, leg, neck, head and trunk (emphasis on straight patterns), specific techniques of emphasis-repeated contractions – slow reversal, contract and relax, hold and relax, rhythmic stabilization, inhibitory techniques, Bobath, Rood’s and KaJat.

7. Relaxation: muscle tone, postural tone, general and local relaxation techniques of relaxation

8. Neuro Muscular coordination: Factors governing co ordination, principles of reeducation, Frenkel’s exercises and its techniques

9. Functional Reeducation: Mat activities for reeducation of hemiplegics, paraplegics and cerebral palsy, walking reeducation in neurological and orthopedic conditions.
10. Aerobic exercises: Physiological effects and therapeutic uses, fitness testing, stress testing for healthy and convalescent individuals.

11. Breathing exercises: Mechanisms of normal breathing, muscles of respiration, changes in thoracic cage during the process of respiration, segmental and diaphragmatic breathing exercises, pursed lip breathing, FET, breathing mechanisms and postural drainage, assistive measures, techniques, indications and contraindications

12. Hydrotherapy: physiological properties of water and hydrodynamics, physiological and applications of Bad Ragaz Technique, indications and contraindications

5. KINESIOLOGY

Application of

1. **Mechanics of joint motion**: Structure and types of joints and types of movements

2. **Mechanics of muscular action**: Classification of muscles, line of pull, types of contractions, role of muscles and tendons action of two joint motions, non customary action

3. **Skilled Movements**: Swimming, climbing, cycling, running, ballistic and volitional movements

4. **Impetus**: Impetus to external objects and to living beings

5. **Locomotion**: Normal gait, analysis of phases of gait, normal gait with kinetic and kinematics, abnormal gait, pathological gait, gait training

6. **Biomechanics of joints**: Kinetics, kinematics, patho-mechanics of joint – hip, knee, ankle, foot, shoulder, elbow, wrist and hand

7. **Biomechanics of spinal column**: Spinal curves, articulations, non contractile soft tissue of column, IV disc, ligaments, intrinsic equilibrium, movements of spinal column and muscle mechanics

8. **Mechanics of pelvic complexes**: Pelvis in standing body and in motion, patho mechanics of pelvis

9. **Mechanics of thorax**: Movements between ribs and vertebrae, sternum and ribs, patho mechanics of respiration

10. **Postural strain and occupational hazards**: Correct use of body mechanics at home, at school and work, recreation, particular application for patients, physiotherapists and other staff

11. **Kinetics and kinematics of ADL**: Supine to sitting, Sitting to standing, Squatting, Climbing up and down, pushing, pulling, overhead activities, walking, running, jogging

6. ELECTROTHERAPY

Objectives
At the end of the course the candidate will be able to

1. Recall the Physics – Principles and laws of electricity, Electromagnetic spectrum, Ultrasound
2. Describe the electrical main supply, Electric shock – precautions
3. Describe and identify various types of electrodes used in therapeutics, resistance offered by the skin and significance of various media used to reduce the same
4. Describe the production, physiological effects, therapeutic uses, merits/ demerits, indications and contraindication of various Low, Medium and High frequency currents and modes. Describe the panel diagrams of the machine
5. Acquire the skill of application of Low, Medium and High frequency currents on models for the purpose of treatment
6. Describe the physiological effects and therapeutic uses of various therapeutic ions to be used for the application of Iontophoresis
7. Describe effects of electromagnetic field at the cellular level and risk factors on prolonged exposure
8. Describe the physiological effects and therapeutic uses of various topical pharmacotherapeutic agents to be used for the application of Phonophoresis
9. Acquire an ability to select the appropriate mode as per the tissue specific and area specific application.

Syllabus
LOW FREQUENCY CURRENTS
Review of physics: Current, electricity, Ohm’s law, Resistance, Rheostats, potentiometers, Electromagnetic induction, capacitors, valves, semiconductors and transistors
Nerve Muscle Physiology: Resting potential, action potential, propagation of action potential, motor unit, synapse and synaptic transmission of impulses. Effect of negative and positive electrodes on nerve & accommodation.
Electric shock: Causes, severity, treatment and precautions Earth shock and its precautions
Faradic Current: Definition, characteristic and modified faradic current, sinusoidal current, parameters of faradic stimulation, physiological and therapeutic effects of faradic stimulation. Indication, contra-indications and precautions, techniques of stimulation- group muscle stimulation, faradic foot bath, faradism under pressure and pelvic floor muscle re-education
Interrupted Direct Current: Introduction & characteristics, Parameters of stimulation, physiological and therapeutic uses of stimulation, precautions
Galvanic Current: Introduction & characteristics, Parameters of stimulation, physiological and therapeutic uses of stimulation, precautions
Iontophoresis: Definition, principles of Iontophoresis, physiological and therapeutic uses, indications, techniques of Iontophoresis, principles of treatment, contra-indications and dangers
TENS: Definition, types, Theories of pain modulation emphasizing on “Pain gate” theory, techniques of treatment, indication and contra-indications

MEDIUM FREQUENCY CURRENT
Interferential current: Definition, characteristics, physiological & therapeutic effects of Interferential current, techniques of application, indications, contra-indications and precautions
Bio-feedback: Introduction, principles of Bio-feedback, therapeutic effects of biofeedback, Indications and contra-indications, techniques of treatment

Advanced Electrotherapy: Computerization in electrotherapy, Programming of parameters of treatment, appropriate selections of parameters and combination therapy, Combination therapy-principles, therapeutic uses and indications like, Ultrasound therapy with stimulation or TENS etc.

Introduction to Russian current, Dia-dynamic current, HVPGS and Micro currents

Electrical currents for Care of the wound

HIGH FREQUENCY CURRENT

Short Wave Diathermy (SWD): Introduction, physiological effects and Therapeutic effects of SWD, methods of application (capacitor field method and cable method etc.)

Techniques of treatment, indication, contra-indications and dangers

Pulsed SWD: Definition, characteristics, mechanism of work, physiological effects and therapeutic effects, indications, techniques of application, principles of treatment and contra-indications

Ultrasonic Therapy: Introduction and characteristics, Ultrasound Therapy parameters, coupling media, therapeutic effects, indications, contra-indications and dangers, testing of apparatus, techniques of application & dosage, Phonophoresis

Electromagnetic waves: Electromagnetic spectrum, physical properties of electromagnetic radiations, reflection, refraction, absorption penetration, Grothus’ law, Cosine law, Inverse square law and -Physical Application

Cellular bio-physics – perception and transmission of electromagnetic signals Environmental effects and Intracellular effects on prolonged exposure to electromagnetic field

Infra Red Rays (IRR): Production of infra-red rays, luminous and non – luminous generators, penetration, techniques of application, physiological effects and therapeutic uses of infra-red rays, duration and frequency of treatment, indications and contra indications, dangers and precautions.

Ultra Violet Rays (UVR): Production of UVR, techniques, physiological effects of UVR dosimetry in UVR, PUVA

LASER: Introduction and characteristics, effects on tissue, therapeutic effects, principles of application, indications, contra-indications and dangers

Microwave Diathermy (MWD): Introduction and characteristics, physiological effects, therapeutic effects, techniques of application and principles of treatment, indications, contra-indications and dangers

Superficial heat modalities: Paraffin wax bath: Structure of the apparatus, composition of wax and mineral oils physiological effects and therapeutic uses of wax bath, technique of application

Other Heating Modalities: Heating pad, moist heat and fluid therapy

Cryotherapy: Physiological effects and therapeutic uses of ice therapy, Techniques of application, contra – indication to ice treatment

Hydrotherapy: Properties of water buoyancy, effects of buoyancy on movement, Hubbard tank, contrast bath, whirlpool bath

Care of the wound: UVR, LASER and Ultrasound
7. ORTHOPADICS (TRAUMATIC)

Objectives
At the end of the course, the student will be able to
1. Discuss the patho-physiology, clinical manifestations and conservative/surgical management of various traumatic and cold cases of the musculo-skeletal conditions
2. Traumatic and cold cases both operative and non-operative
3. Gain the skill of clinical examination and interpretation of the preoperative cold cases and all the post-operative cases
4. Read and interpret a) salient features of the x-ray of the spine and extremities, b) pathological/biochemical studies pertaining to orthopedic conditions
5. Correlate the radiological findings with the clinical findings.

Syllabus
1. Introduction: Fracture, dislocation and injuries of the upper limb. Briefly mention general principles of Orthopedic surgery, definition and scope, brief history
2. Fracture & dislocation: Causes, types, mechanisms, displacement, general symptoms, healing, principles of treatment, complications, malunion, delayed union, non-union, myositis ossificans, Volkmann’s ischemic contracture, Fat embolism, Sudeck’s osteodystrophy
3. Injuries to the hand: Types (open, closed), principles of treatment, injuries to the phalanges, sprains, dislocations of MP & IP joints, fractures of the phalanges, metacarpals, Bennett’s fracture, mallet finger, tendon injuries (flexor & extensor)
4. Wrist & Forearm injuries: Wrist dislocation, Colle’s fracture, displaced epiphysis, Smith’s fracture, Barton’s fracture, injuries to carpal, scaphoid and sprains, fractures of forearm bones – greenstick fracture, Infraction injury, both bone fracture, Galleazzi, Monteggia fracture dislocation
5. Injuries to the elbow: Traumatic synovial sprain, dislocation of elbow joint
6. Fractures involving elbow joint: Supracondyolar fracture, intercondylar fracture, fracture medial epicondyle, fracture of lateral condyle, myositis ossificans, Volkman’s ischaemic contracture, fracture of the head of the radius, fracture of olecranon
7. Injuries of shoulder and arm: Fractures of the proximal end, neck and shaft of humerus, fractures of clavicle, acromioclavicular and sternoclavicular dislocations, fractures of the scapula
8. Injuries of the spine: Injuries to the cervical spine (Both upper and lower), atlanto-axial injuries
   Dorso Lumbar spine: classification, mechanism and types of injuries, stable fracture without paraplegia, fracture dislocation with paraplegia, management of fracture, management of paraplegia, bedsore and bladder care
9. Injuries of the pelvis: Fractures, its mechanism, classification, management, Fractures of acetabulum, sacrum and coccyx
10. Injuries of the lower limb: Dislocations of the hip joint, intracapsular and trochanteric fractures of femur, fractures of the neck of femur, fracture of the shaft of femur, fracture femur in children
Fracture of femoral condyles, tibial condyles and patella. Injuries to extensor mechanism, contusion, haemarthrosis, knee joint dislocation and traumatic dislocation of patella
Fracture and fracture dislocation of ankle, epiphyseal injury lower end of tibia Foot: fracture of talus, calcaneum, metatarsals and phalanges
Orthopaedic splints and appliances for injuries to muscles and tendons
12. Tendon transfer: Principles, indications, common tendon transfer surgeries
13. Amputation: Types, site, ideal stump, complications, general principles of treatment
Upper extremity and lower extremity amputations – prosthesis and prosthetic service
Principles of operative management, indications and contraindications for arthroplasty, osteotomy, arthrodesis, spinal stabilization, arthroscopy
14. Limb reattachment

8. ORTHOPAEDICS (NON-TRAUMATIC)

General Orthopedics
1. Clinical examination of orthopaedic patient, investigations, radiological and imaging techniques (salient features)
2. Deformities, acquired deformities, causes and principles of management, splinting
3. Traction: procedures, materials
4. Preventive orthopedics
5. Geriatric orthopedics

Congenital disorders
1. Torticollis, wry neck, kyphosis, lordosis, scoliosis, spina bifida, myelomeningocele, congenital dislocation of hip, congenital genu recurvatum, talipes equinovarus
2. Elevation of scapula, madelung’s deformity, coxa vara
3. Endocranial dystosis, superior radio-ulna dysostosis, sternocleido mastoid tumor

Infection of bones & joints
1. Osteomyelitis (acute and chronic), Brody’s abscess as a complication of open fracture
2. Skeletal tuberculosis, principles of treatment, T.B. of shoulder, elbow and wrist T.B. of hip, knee ankle, and foot
3. Dactylitis, caries rib

Arthritis
1. Acute pyogenic arthritis, septic arthritis of infancy, small pox arthritis, Syphilitic infection of joint, Rheumatoid arthritis, osteoarthritis
Bone tumors
1. Classification, true bone tumors: osteosarcoma, giant cell tumor, Ewing's sarcoma, chondroblastoma, chondrosarcoma, fibrosarcoma, lymphoma of bone, plasmacytoma
2. Bone metastasis: synovial sarcoma, hemangioma of bone, adamantinoma of long bones and chondroma
3. Tumor like lesions: osteoid osteoma, benign osteoblastoma, non osteogenic fibroma, osteoma, osteochondroma and enchondroma

Neurological and Muscular disorders
1. Definition, causes, clinical feature, complications, management (Multidisciplinary approach) medical and surgical of the following conditions: Cerebral palsy, Poliomyelitis, Leprosy
2. Muscular dystrophy – types and treatment
3. Injuries to plexus and nerves: Radial, Ulnar, Median, Brachial plexus, Sciatic and Lateral Popliteal.

Regional conditions of Spine and Lower Limb
1. Back: Kyphosis, Scoliosis, Spondylolisthesis, Lumbosacral strain, intervertebral disc prolapse, fibrosis back, Lumbosacral stenosis, sacroiliac strain, spondylosis, spondylolisthesis
2. Hip: Slipped capital femoral epiphysis, idiopathic chondrolysis of hip
3. Knee: Genu valgum, genu varum, tibia varum, genu recurvatum, quadriceps fibrosis, recurrent dislocation of patella, bursa around the knee, loose bodies in the knee, chondromalacia patella
4. Foot: Painful heel, Plantar fasciitis, Posterior heel pain, flat foot, foot strain, pain in forefoot, Hallux valgus, anterior metatarsalgia

Regional conditions of Neck and Upper Limb
1. Neck: Cervical spondylitis, intervertebral disc prolapse, Cervical rib, torticollis, Brachialgia
2. Shoulder: Supraspinatus tendinitis, calcification, rupture of rotator cuff, periartitis shoulder, deltoïd fibrosis, subacromial bursitis, Bicep tendinitis
3. Elbow: Tennis elbow, Golfers elbow, recurrent slipping of ulnar nerve, cubitus varus and valgus
4. Wrist and Hand: Ganglion, De Quervain's disease, trigger finger, trigger thumb, carpal tunnel syndrome and Dupuytren's contracture
5. Miscellaneous: metabolic disease, rickets, osteomalacia, osteoporosis, parathyroid osteodystrophy, scurvy etc.

9. RADIOLOGY
(Not for University Exam)

Objectives
At the end of the course the candidate will be able to
1. Identify common chest conditions together with basic traumatic, infective,
inflammatory and degenerative conditions and bony skeletal
2. Read CT, MRI of different joints.

Syllabus
1. Introduction to Radiology
2. Importance of Radiology in Physiotherapy
3. X-rays of fractures of different bones in the body
4. X-rays of different stages of fracture healing
5. X-rays of different Orthopedic conditions - Osteoarthritis, Rheumatoid arthritis
6. Cervical & lumbar spondylisis, foot deformities etc.
7. X-rays of common chest conditions
8. C.T Scan, M.R.I.,Angiography, 3D reconstruction of bones & joints

10. ENT
Anatomy & Physiology of Hearing: Assessment & Management of Hearing Loss
Introduction to Disease of ENT: Otitis media, Sinusitis & Rhinitis
Facial Nerve Palsy: Causes & Management
Larynx & Associated functional problems with tracheostomy & Care of tracheostomy
Vertigo: Causes, Assessment & Management

OBJECTIVES:-
At the end of the course, the candidates will be able to:
1. acquire the knowledge of Etiology, patho-physiology, signs and symptoms and management in brief, of the infectious diseases, diseases of metabolism especially obesity and other related medical conditions, diseases of hematopoietic system, diseases of GI and urinary tract & endocrine disorders
2. describe etiology, patho-physiology, signs and symptoms, clinical evaluation and management of the various cardio-vascular and respiratory disorders with interpretation of investigations: chest x-ray, Echocardiography, blood gas analysis, blood investigations and pulmonary function test
3. acquire the knowledge of auto-immune & rheumatological conditions with special emphasis to those involving Musculoskeletal system and skin, with regards to etiology, pathophysiology, signs and symptoms, differential diagnosis and medical management of same

SYLLABUS:-
1. Respiratory Diseases : Lung function tests, pneumonia, lung abscess, bronchiectasis, asthma, emphysema, pleural effusion, Pneumothorax, empyema, chronic bronchiectasis,
2. Cardio Vascular Diseases : Rheumatic fever, valvular lesions, congestive cardiac failure, ischaemic heart diseases (Angina pectoris and myo-cardial infarction) stress test, hypertension, peripheral vascular-diseases (TAO, Raynauds disease). 
3. Endocrine Disorders : Diabetes mellitus, thyrotoxicosis, myxedema.
4. Gastro-Intestinal Disorders : Peptic ulcer, pancreatitis, dysentries and diarrhea,
inflammatory bowel diseases, jaundice, cirrhosis of liver.
5. Infectious Disease : Tuberculosis, malaria, typhoid, infective hepatitis, tetanus.
8. Rheumatology : Rheumatoid arthritis, ankylosing spondylitis, gout, osteoarthritis, Spondyloarthritis, systemic lupus erythematosus, polyarteritis nodosa, mixed connective tissue disorders, scleroderma.

2. SKIN & V.D. (DERMATOLOGY)

OBJECTIVES:-
At the end of the course, the students will be able to
1. acquire knowledge in structure and function of the skin and about various primary, secondary and special skin lesions related to systemic disorders
2. describe etiology, clinical features and management of bacterial, fungal, viral, allergic, autoimmune skin diseases
3. acquire knowledge in sexually transmitted diseases and leprosy.

SYLLABUS:-
1. Structure and functions of normal skin, primary and secondary skin lesions.
2. Scabies and pediculosis.
3. Fungal infections of skin : Dermatophylosis, Phlyartitis versicolor, Candidiasis.
5. Viral infections of skin : Herpes zoster.
7. Psoriasis / Acne / Alopecia / Vitiligo and Leukoderma.
8. Leprosy / Lepra - reaction/Physiotherapy in leprosy.
9. Sexually transmitted diseases : Syphilis - primary & secondary, Gonorrhoea, Chancroid, AIDS.

OBJECTIVES:-
At the end of the course, the candidate will be able to
1. describe etiology, patho-physiology, sign and symptoms, clinical evaluation and management of the various neurological conditions with interpretation of laboratory & radiological investigations.

SYLLABUS:-
1. Anatomy, Physiology, Lesions and diseases of Pyramidal system, extra-pyramidal system, cerebellar system, spinal cord, upper and lower motor neuron, cranial nerves, brachial plexus, lumbosacral plexus and peripheral nerves.
2. Causes, Clinical features, and management of: Unconscious patient, hemiplegia, paraplegia, quadriplegia, cerebral diplegia, spastic child, foot drop and wrist drop.
4. Infections : Encephalitis, meningitis, poliomyelitis, transverse myelitis, slow viral diseases.
5. Diseases of Peripheral nerves: Peripheral neuropathy, other neuropathies.
7. Degenerative diseases: Parkinsonism, motor neuron diseases, spinocerebellar degenerations and diseases of anterior horn cell, dementia.
10. Basic concept of electrophysiology and electromyography.

4. PAEDIATRICS

OBJECTIVES:
At the end of the course, the candidate will be able to
1. describe normal development and growth of a child, importance of immunization and breast feeding and psychological aspect of development
2. describe neuro muscular, musculo skeletal and cardio pulmonary conditions related to immunological conditions, nutritional deficiencies, infectious disease and genetically transmitted conditions
3. acquired skill of clinical examination of the child with respect to neurological, musculoskeletal and respiratory function.

SYLLABUS:
1. Growth and development of a child from birth to 12 years, including physical, social, adaptive development.
2. The maternal and neonatal factors contributing to high risk pregnancy, the neonate, inherited diseases, maternal infections - viral and bacterial, maternal diseases incidental to pregnancy, induced hypertensive, chronic maternal diseases such as heart disease, renal failure, tuberculosis, diabetes, epilepsy, blessing the mother at any trimester.
3. Community programmes: International (WHO), national and local, for prevention of poliomyelitis, blindness, deafness, mental retardation and hypothyroidism, the immunization schedule for children.
4. Cerebral Palsy: Etiology - prenatal, perinatal and postnatal causes, pathogenesis, types of cerebral palsy (classification), findings on examination, general examination, examination of C.N.S., musculoskeletal system, respiratory system, G.I. Tract and nutritional status.
5. Associated defect: Mental retardation, microcephaly, blindness, hearing and speech impairment, squint and convulsions.
7. Muscular Dystrophy: Various forms, modes of inheritance and clinical manifestation, physical findings in relation to disabilities, progression of various forms and prognosis, treatment goals in forms which are not fatal.
9. Sill's Disease: Classification, pathology in brief, physical findings, course and prognosis, treatment, prevention and correction of deformity.
10. Acute C.N.S. infections, Classification (Bacterial and Viral), the acute illness, C.N.S. sequelae leading to mental retardation, blindness, deafness, speech defect, motor paralysis,
bladder and bowel problems, seizure disorder and specific problems such as subdural effusion, hydrocephalus, pressure sores, feeding difficulties.

11. Normal diet of newborn and child: List dietary calorie, fat, Protein, mineral and vitamin requirement in normal child and in a child with malnutrition. Etiology, findings, and treatment of rickets, vitamin D deficiency and resistant rickets

12. Lung infections: Clinical findings, complications and medical treatment of bronchiectasis, lung abscess and bronchial asthma.

5. GENERAL SURGERY & PLASTIC SURGERY

OBJECTIVES:-
At the end of the course, the student will be able to
1. describe the effects of surgical trauma and anesthesia in general
2. classify, clinically evaluate and describe the surgical management in brief in
   a) wounds-u=cers b) burns
3. describe pre-operative evaluation, surgical indications and various surgical approaches in various abdominal conditions and peripheral vascular conditions
4. recall the surgical approaches in the form of line diagram and will be able to describe the components of soft tissues cut to reach the target tissue, and the possible post-operative complications in movement
5. clinically evaluate post-operative abdominal conditions with special reference to the cardiovascular and pulmonary function, describe post-operative management in brief.
6. describe the management of head injury, spinal surgery, intracranial tumors, peripheral nerve lesions and pain

SYLLABUS:-
1. Acute infections, Inflammatory fever, bacteremia, septicemia, pyemia, toxemia. Specific types - Cellulitis - sites lymphangitis, abscess with special reference to hand infection, carbuncle.
2. Specific types cont'd : Tetanus, gas gangrene, hospital infection, cross infection with modes of spread and prevention, General survey of chronic inflammations, Syphilis (reference to other venereal diseases) leprosy, actinomycosis
3. Surgical tuberculosis
5. Burns as a specific type of severe trauma, classification, early and late complications, management & reconstructive surgery - skin grafting as an example of plastic procedure

General survey of surgical disorders of spine and spinal cord problem of paraplegia, malignancy - spread and its behavior, various abdominal incisions, abdominal drainage tubes, catheters and nasogastric tubes, ward demonstration for an hour a day for a period of one week.

8. Neck, skin contractures and correction.
9. Problems of trauma to hand and their management, Urinary tract infection.

Neuro Physiology:
Neurophysiology, basis of tone, disorders of tone and posture, bladder control, muscle contraction, movement and pain.

Clinical Features and management of the following
2. Trauma - Broad localization, first aid and management of sequelae of head injury and spinal cord injury.
5. Intracranial tumours - Broad classification, signs and symptoms.
6. Pre-operative Assessment and Indications and contra-indication for neurosurgery.
7. Management of pain, electrical stimulation of brain and spinal cord.
8. Miscellaneous.

Objectives:-
At the end of the course, the student will be able to
1. describe types of incision, pre and post-operative assessment and complications of Cardiothoracic surgery and their management
2. clinically evaluate post-operative status, vascular and pulmonary function status
3. read and interpret investigations including findings of the x-ray chest, CT scan and MRI scan.

SYLLABUS:-
1. Basic anatomy of chest wall, trachea and bronchial tree, lungs and bronchopulmonary segments, pleura and mediastinum.
2. Physiology and mechanics of breathing and use of mechanical breathing - ventilator (respirators).
3. Pulmonary function tests.
4. Investigation of lung diseases including endoscopies.
5. Chest injury.
7. Bronchogenic carcinoma
8. Common surgeries of chest
   Thoracoplasty, pulmonary dissections, thoracotomy.
   Pneumothorax, hydrothorax-Pneumothorax, empyema.
10. Surgery of portal hypertension.
12. Surgery of heart and great vessels.
13. Basic anatomy of heart, great vessels.
15. Cardiac arrest, its management.
16. Basic principles of open heart surgery, Heart lung bypass (Extra Co-portal circulation)
17. Common diseases of heart requiring surgery both congenital and acquired including open heart surgery.
18. Common drugs used in cardiac surgery, its uses, side effects.
19. Common vascular surgery, Embolectomy, vascular reconstructive surgery, (Thrombosis, Embolism, atherosclerotic and occlusive vascular diseases including coronary artery bypass)

Clinical: 1. Examination of patients as regards chest & heart diseases.
2. Demonstration - Acquaintances with C.T. Surgery,
   Equipments, I.C.C.U.O.T.
   Radiology - X-ray studies - X-ray chest in various lung diseases.

7. OBSTETRICS AND GYNAECOLOGY

OBJECTIVES:
At the end of the course, the students will be able to:
1. describe the normal and abnormal physiological events during the puberty, labor, puerperium, post-natal stage and menopause.
2. discuss various complications during pregnancy, labor, puerperium and postnatal stage, pre- and post-menopausal stage and various aspects of urogenital dysfunction and the management in brief
3. acquire knowledge in brief about intrauterine development of the fetus
4. acquire the skill of clinical examination of the pelvic floor
5. acquire the skill of the clinical examination of the pregnant woman.

SYLLABUS:
2. Physiology of menstrual cycle-ovulation cycle, Uterine cycle Cx. cycle, Duration, amount.
3. Hormonal regulation of menstruation.
4. Diagnosis of pregnancy.
5. Abortion
6. Physiological changes during pregnancy.
7. Antenatal care exercises.
8. High risk pregnancy.
11. Family planning.
12. Medical Termination of pregnancy (MTP).
13. Infection of female genital tract including sexually transmitted diseases, low backache.
15. Principles of common gynaec operations Hysterectomy.
8. PHYSICAL & FUNCTIONAL DIAGNOSIS

OBJECTIVES:
At the end of the course, the candidate will be able to
1. Describe the human development & maturation; with special emphasis to psychomotor development, maturation & alteration during aging process
2. Acquire the skill of detection & objective documentation of the Neurological, Musculoskeletal, Cardiovascular & pulmonary dysfunctions such as pain, altered muscle power, mobility, endurance, limb length, posture, gait, hand function & A.D.L. in adult & pediatric conditions & acquire skill & to arrive at the Functional diagnosis as per International Classification of Functioning (ICF)
3. Describe the physiology of nerve impulse, motor unit, its electro-physiological character and acquire the skill of performance and interpretation of various electro-diagnostic tests in the assessment of peripheral nerve lesions
4. Be able to do interpretation of common investigations used to arrive at the Physical & Functional diagnosis.

SYLLABUS:
General principles of Human development & maturation
1. Aspects: physical, motor, sensori-cognitive, emotion, cultural, social
2. Factors influencing human development & growth: Biological, environmental, inherited.
3. Principles of maturation & its general developmental functional pattern cephalo-caudal, proximo-distal, centro-peripheral, gross to fine motor development

4. Reflex maturation tests
5. Development in specific fields: Oromotor development, sensory development, neurodevelopmental hand function

Electro diagnosis
1. Bioelectricity-Physiology of generation & propagation of action potential, volume conduction
2. Therapeutic current-as a tool for electro diagnosis
3. Physiological principles, use of stimulation & measurement in electro-diagnosis such as sensory & Pain threshold, Pain tolerance, Short & long pulse test, S.D. curves, Chronaxie & Rheobase, accommodation ratio
4. Principles of nerve conduction studies, late responses*
5. E.M.G. instrumentation, basic components, panel diagram, types of electrodes
6. Principles of Electro- myography, motor unit—Normal characteristics—activity at rest, recruitment/frequency pattern at minimal activity, Interference pattern

Assessment of Neurological dysfunction
1. Higher functions, cranial nerves, sensations & sensory organization, body image, tone, reflexes: superficial & deep, voluntary control, muscle strength, coordination, balance, posture, gait
2. Scales: FRT, Berg’s Balance, modified Ashworth, Glasgow Coma, TUG, FIM
3. Functional diagnosis using ICF
4. Interpretation of electro diagnostic findings, routine biochemical investigations

Assessment of Musculoskeletal Dysfunction
1. Tightness, deformity, joint mobility, muscle strength, limb length, trick movement, girth,
posture, gait, special tests  
2. Functional diagnosis using ICF  
3. Interpretation of X-ray of extremities & spine, routine bio-chemical investigations, CT scan, MRI  

**Assessment of cardio-pulmonary dysfunction**  
1. Vital parameters, chest expansion, chest excursion, breath holding test, breath sounds, rate of perceived exertion (RPE), peak flow rate  
2. Exercise Tolerance: six minutes’ walk test, theoretical bases of Bruce’s protocol, step test  
3. Ankle Brachial Index, tests for peripheral arterial & venous circulation  
4. Functional diagnosis using ICF  
5. Interpretation of X-ray chest, routine bio-chemical investigations, ABG, PFT, ECG (normal values)  

**Assessment of pain**  
1. Intensity & quality  
2. Objective assessment & documentation: VAS, Numerical Rating Scale. Other scales  

**Assessment of Hand**  
1. Sensations, mobility of joints, strength  
2. Special tests  
3. Hand function: Precision & power grips  

**Assessment of Obesity**  
1. Classification  
   Introduction to Quality of Life Questionnaire  

**PRACTICALS:** Skills to be practiced on peer/model  
Case presentation with Physical & Functional diagnosis in medical — surgical conditions  

**OBJECTIVES:**  
At the end of the course, the student will be able to  
1. enumerate various psychiatric disorders with special emphasis to movement, pain and ADL & describe the various causative factors and methods of assessment and management  
2. acquire the knowledge in brief about the pathological and etiological factors, common signs and symptoms and management of various psychiatric conditions  
3. describe in brief the various treatment modalities commonly used.  

**SYLLABUS:**  
1. **Mental health:**  
   Normal Mental Health  
   Criteria of normality or matured personality  
   Factors contributing to normal mental health.
2. Study of Abnormal Personality:
Neurotic
Hysterical
Psychotic
Paranoid
Schizophrenic
Psychopathic etc.

3. General Etiological Factors:
Hereditary
Genetical Constitutional
Acquired
Traumatic
Infective
Toxic
Degenerative
Social and Environmental including pathogenic family patterns
Precipitating causes
Frustration and conflicts.

4. Symptomatology and Treatment of:
Psychoses:
(1) Functional - Functional, schizophrenic reaction group, simple, paranoid, catatonic, hebephrenic paranoid state, paranoia, juvenile schizophrenia, autistic thinking, dementia.
(2) Organic - Toxic confused states, enile psychoses, atropho, atrophic, degenerative, G.P.I.

5. Neurosis:
Symptomatology, diagnosis and treatment and psychodynamics of anxiety state, hysteria, conversion reaction, dissociative reaction, dual personality, obsessional neurosis, phobias, hypochondriasis, neurasthenia and mental fatigue.

6. Mental Retardation:
Definition,
Etiological factors - Prenatal, postnatal, infective, hormonal, congenital.
Types of mental retardation, clinical types-microcephaly, hydrocephalus, mongot, family idiocy, phenylketonuria etc. Symptomatology of various grades of retardation, differential diagnosis and treatments.

7. Child Psychology:
Behavior disorders - Nail biting, Enuresis, Truancy, Thumb sucking, Speech difficulties, Pica, Vomiting, Anorexia, delinquency.

8. Introduction to dynamics of Psychophysical disorders:
Asthma, skin rashes, hypertension, bowel disorders.
Introduction to treatment in psychiatry - E.C.T., Insulin, coma therapy.
Drug therapy - Tranquilizer, Mood elevators, hypnotics and sedatives, Psychotherapy - Deep
and superficial, individual and group, expressive, suppressive, environmental manipulation, re-
educative.
Psychodrama
Psychoanalysis
Play Therapy
Physiotherapy
Occupational Therapy.

10. ALLIED THERAPEUTICS (Basics only)

OBJECTIVES:
At the end of the course the candidate will be able to
1. Comprehend the use of various allied therapeutic sciences in health care delivery.

SYLLABUS:
1. Acupuncture and acupressure: definition, principles, techniques, physiological and
therapeutic effects, contraindications and dangers.
2. Introduction to Naturopathy
3. Magneto therapy
4. Yoga Sana -pranayama and its scientific study in detail.
5. Introduction of dry needling

Introduction
Definition and history of DN, Physiology of PAIN, Trigger points, cause and effect.
Theories behind DN.

GENERAL PRACTICE GUIDELINE:
General guideline for DN, Integrated approach to DN, General hygiene and work place policies.
Indications for DN.

SAFETY:
Safety Introduction, Potential Risk, Adverse event studies of ACUPUNCTURE.
INDICATIONS & CONTRAINDICATIONS of DN, Anatomical Consideration

Principles of DN Practical Application:
Principles of practice, Patient education and consent, Patient selection,
Application - Positioning
- Palpation
- Techniques.

Hygiene:
Introduction, Standard Precautions, hygiene recommendations.
Hand decontamination techniques.
- Hand washing
- Alcohol based hand rub.

Use of GLOVES.

Patient skin Preparations:
Needles, Selection of Needles, Needle and medical waste disposal, Procedural needle stick
injury.
Management of blood and body spills.
DN co-relation with Acupuncture Treatment:
Acupuncture – History and theories, Differences between Acupuncture and DN.

Electrical stimulation with DN:
Introduction with Acu Stimulator, Stimulator Application guideline, Effects of stimulation with DN.

Muscle wise Practical’s and Training:
Upper limb, Lower limb, Spine, Thorax, face.

II. OPHTHALMOLOGY

OBJECTIVES:
At the end of the course, the students will be able to
1. acquire knowledge of structure and function of the eye
2. describe etiology, patho-physiology, sign and symptoms and clinical evaluation of common ophthalmic conditions related to Physiotherapy

SYLLABUS:
1. Common eye diseases, including Keratoconjunctivitis, trachoma.
2. Cataract and glaucoma.
3. Squint and ptosis.
4. Eye lesions in leprosy, including causes of treatment and complications of lagophthalmos.
5. Causes, clinical features and treatment of disorders of eye movement occurring in diseases such as myasthenia gravis, progressive external ophthalmoplegia and lower motor neuron diseases.
6. Causes, clinical features, treatment and prognosis in inflammatory disorders, vitamin A deficiency, emphasis on preventing causes and prophylactic measures.
7. Definition of blindness, and visual disability evaluation; investigative procedures used for testing visual failures.

FINAL YEAR II PHYSIOTHERAPY

1. PHYSIOTHERAPY AND NEUROMUSCULAR CONDITION

OBJECTIVES:
At the end of the course candidate will be able to
1. Acquire the knowledge of normal neurodevelopment with specific reference to locomotion
2. Assess, identify and analyze neuro motor and psychosomatic dysfunction in terms of alteration in the muscle tone, power, coordination, involuntary movements, sensations, perceptions etc.
3. Correlate the assessment findings with provisional diagnosis and investigations such as EMG/NCS and arrive at Physical and functional diagnosis with clinical reasoning in various neuromuscular disorders
4. Plan, prescribe and execute short term and long term treatment with special reference to relief of neuropathic and psychosomatic pain and use of various physiotherapeutic techniques/ modalities, including ergonomic advice and patient education in neuro pediatric cases
5. Prescribe appropriate orthoses/splints and fabricate temporary protective and functional splints.
SYLLABUS:
- Review of basic neuro anatomy and physiology
- Physiotherapy techniques to improve tone, voluntary control, co-ordination
- Neuro physiotherapeutic Techniques:
  - Concepts, principles, techniques and effects of: NDT, PNF, Brunnstrom movement therapy, Vojta therapy, Rood's sensory motor approach, Contemporary task oriented approach
  - Application of skills as PNF, co-ordination, functional re-education, balancing exercise by using techniques based on neuro physiological principles
  - Tools used for neuro rehabilitation like vestibular balls, tilt board etc.
  - Application of transfer, functional re-education exercises & gait training
  - Bladder training.
  - Developing a philosophy for caring.
  - Prescription of appropriate orthotic devices & fabrication of temporary splints
  - Lifting techniques, wheel chair modifications, adaptive devices.
  - Ergonomic advice for prevention/rehabilitation to the patients / parents / caregivers
  - Education about handling of a patient
1) Pediatric Neuro-physiotherapy
   - Use of various Neurophysiological approaches & modalities in high risk babies, minimum brain damage, developmental disorders Cerebral palsy, Down's syndrome, Hydrocephalus, Spina bifida
2) Assessment & management of brain Disorders
   - Stroke, Meningitis, Encephalitis, Head injury, Parkinson's disease, parkinsonism syndromes, Multiple sclerosis, Brain tumors
3) Assessment & management of spinal cord lesions and bladder dysfunction
   - Multiple sclerosis, transverse myelitis, Poliomyelitis, PPNS, syringomyelia, spinal cord injury and sub acute combined degeneration of spinal cord, Motor neuron disease (ALS, SMA and other types), spinal tumors
4) Assessment & Management of Co-ordination Disorders
   - Ataxia, Friedreich's ataxia, Cerebellar ataxia, Sensory ataxia
5) Assessment & Management of Muscle Disorders
   - Muscular dystrophy (DMD) & other myopathies
6) Assessment & Management of disorders of neuromuscular junction
   - Myasthenia Gravis
7) Assessment & management of neuropathies and nerve injuries
   - Emphasis on 5th, 7th and 8th cranial nerves, Peripheral nerves, Polyneuropathy – Classification of Polyneuropathies
8) Pre-and post-surgical assessment & management in neuro surgery
   - Hydrocephalus and myelomeningocele, C.V. junction anomalies, syringomyelia
9) Electro diagnostic procedures and prognosis in neurological disorders
   - SD curves, EMG & NCS

2. PHYSIOTHERAPY IN MUSCULO-SKELETAL CONDITIONS

OBJECTIVES:
At the end of the course the candidate will be able to
1. Identify, discuss and analyze the musculoskeletal dysfunction in terms of biomechanical, kinesiological and biomechanical basis and correlate the same with the provisional diagnosis,
routine radiological and electro physiological investigations and arrive at appropriate physical and functional diagnosis with clinical reasoning.

2. Describe as well as acquire the skill of executing short and long term physiotherapy treatment by selecting appropriate modes of mobilization/ manipulation, electrotherapy, therapeutic exercise and appropriate ergonomic advise for the relief of pain, restoration/ maintenance of function & / or rehabilitation for maximum functional independence in ADLs at home & workplace.

3. Understand the nature of sports injuries, able to evaluate and treat sports injuries, understand the role of physiotherapist in training and rehabilitating a sports person.

4. Prescribe appropriate walking aids, orthoses and prosthesis.

SYLLABUS:-

- Anatomy of bones and soft tissues (musculoskeletal system)
- Evaluation, interpretation of investigations & functional diagnosis (ICF) with appropriate clinical reasoning for planning & implementation of management techniques.
- Planning, Prescription & Implementation of short term & long term goals with clinical reasoning.
- Documentation.
- Different physiotherapeutic techniques for functional restoration/ maintenance and prevention of disability.
- Different electro therapeutic techniques for relief of acute and chronic pain, swelling, wound healing, re-education &/ or rehabilitation.
- Different physiotherapeutic techniques to improve maintenance muscle performance.
- Different physiotherapeutic techniques to improve joint mobility.
- Different physiotherapeutic strategies for correction & maintenance of good posture.
- Different physiotherapeutic techniques to improve efficiency and safety of gait pattern.
- Prescription of appropriate orthosis and prosthetic devices/ fabrication of simple temporary splints.
- Appropriate Home Program & Ergonomic advice for preventive measures & functional efficiency at home & workplace.

1) Physiotherapy approach in Traumatology:

2) Physiotherapy assessment in fracture cases
- Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period Physiotherapy assessment and management of upper limb fractures and dislocations, lower limb fractures and dislocations including pelvis and spinal fractures.

3) Physiotherapy assessment & management of soft tissue injury
- Contusion, sprains, strains, ruptures.

4) Physiotherapy assessment & management of degenerative conditions
- Osteoarthritis (OA) with emphasis on Knee, Hip and Hand cervical spondylosis, lumbar spondylosis.

5) Physiotherapy assessment & management of inflammatory conditions
- Rheumatoid arthritis (RA), ankylosing spondylitis (AS), Still’s disease, septic arthritis, periartitis, bursitis, synovitis, capsulitis, tendinitis, tenosynovitis, fasciitis, Osgood Schlatter disease.
6) Physiotherapy assessment and management of infective Conditions
   - Tuberculosis (TB) of spine and other major joints, osteomyelitis, pyogenic arthritis, septic arthritis
7) Physiotherapy assessment & management of congenital and acquired Deformities
   Congenital - CTEV, CDH, Torticollis, pes planus, pes cavus, Sprengel's scapula, Madelung's deformity
   Acquired: scoliosis, kyphosis, coxa vara, genu varum, valgum and recurvatum, wry neck
8) Physiotherapy assessment & management of spinal conditions
   Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Intervertebral disc prolapse, Sacroiliac joint dysfunction, Coccydynia, Sacralisation, Lumbarisation, Spina bifida occulta
9) Physiotherapy assessment & management of amputations
   Definition, indications, types, levels of amputation of lower and upper extremities, pre and post operative assessment and management with emphasis on stump care and bandaging, pre and post prosthetic training and complete rehabilitation
10) Rehabilitation of patient with orthopedic surgery
    Pre and post operative management of arthroplasty of all major joints, girdle stone, arthroplasty, arthrodesis, arthroscopy, osteoplasty, Reattachment of limb
11) Physiotherapy assessment & management of reconstructive surgery
    Cerebral Palsy, poliomyelitis, Leucodystrophy
12) Physiotherapy assessment & management of hand injury
13) Physiotherapy assessment & management of metabolic and hormonal disorders of the bone tissue
    Osteoporosis, rickets, osteomalacia
14) Physiotherapy assessment & management of miscellaneous orthopedic conditions
    Mallet finger, trigger finger, De Quervain's disease, metatarsalgia, hallux valgus, Dequytrén's contracture, thoracic outlet syndrome, chondromalacia patellae, ganglion, tennis elbow, plantar fasciitis
15) Sports Medicine
    1. Introduction & classification of sports injury
    2. Aetiological factors
    3. Prevention of sports injury
    4. Frequency and site of injury
    5. Investigation and assessment in sports injury
16) Management of sports injuries
    Pharmacology in sports
    Rehabilitation in sports

3. PHYSIOTHERAPY IN CARDIO-PULMONARY & GENERAL MEDICAL-SURGICAL CONDITIONS

OBJECTIVES:
At the end of the course candidate will be able to
1. Identify, discuss and analyze cardio vascular and pulmonary dysfunction based on pathophysiological principles and arrive at the appropriate physical and functional diagnosis
2. Acquire knowledge of rationale of basic investigative approaches in the medical system and surgical intervention regimes related to cardio vascular and pulmonary impairment
3. Execute the effective physiotherapeutic measures (with appropriate clinical reasoning) with special emphasis to breathing retraining, nebulization, humidification, bronchial hygiene, general mobilization and exercise conditioning in general medical and surgical conditions.

4. Acquire knowledge of the overview of patients care at the intensive care area, artificial ventilation, suctioning, positioning for bronchial hygiene and continuous monitoring of the patient at the intensive care area.

5. Acquire the skill of evaluation and interpretation of functional capacity using simple exercise tolerance tests, symptom limited tests.

6. Select strategies for cure, care and prevention to adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, workplace and in community.

7. Acquire the skill of basic cardiopulmonary resuscitation.

8. Acquire the knowledge of evaluation and physiotherapy treatment for obstetrics and gynecological conditions.

9. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (psychiatry, dermatology and ENT conditions).

10. Assess the various degrees of burns, plan and implement physiotherapy techniques for the rehabilitation of a burn and wound patient.

SYLLABUS:-

1) Anatomy and physiology of respiratory system
   Anatomy of thorax, biomechanics of thoracic cage, muscles of respiration, ventilation/perfusion matching, mismatching, compliance.

2) Investigations and tests
   Sub maximal/maximal exercise tolerance testing, Cardiac stress test, Pulmonary radiographs, PFT, ABG, ECG, hematological and biochemical tests.

3) Physiotherapy techniques to increase lung volume
   Positioning, breathing exercises, Neuromuscular facilitation of respiration, mechanical aids - Incentive spirometry, CPAP, IPPB.

4) Physiotherapy techniques to decrease the work of breathing
   Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education - Breathing control techniques, mechanical aids: IPPB, CPAP, BiPAP.

5) Physiotherapy techniques to clear secretions

6) Physiotherapy in common complications following surgeries

Drug therapy
   Drugs to prevent and treat inflammation, drugs to treat bronchospasm, drugs to treat breathlessness, drugs to help sputum clearance, drugs to inhibit coughing, drugs to improve ventilation, drugs to reduce pulmonary hypertension, drug delivery doses, inhalers and nebulizers.

7) Introduction to ICU & mechanical ventilator
   ICU monitoring - apparatus, airways and tubes used in the ICU - Physiotherapy in the ICU - common conditions in the ICU. Mechanical ventilator: types, modes of ventilator.
advantages and disadvantages Oxygen therapy, CPR, aseptic precautions

8) Physiotherapy assessment & management techniques in Obstructive lung conditions
Chronic bronchitis, emphysema, asthma, bronchiectasis, cystic fibrosis

9) Physiotherapy assessment & management techniques in Restrictive lung conditions
Rib fracture, Pleural effusion, pleurisy and empyema, pulmonary embolism, pulmonary tuberculosis, atelectasis, pneumothorax, bronchopulmonary fistula, pneumonia, ARDS

10) Physiotherapy following Lung surgeries
Pre and post operative physiotherapy assessment and management in Lobectomy, Pneumonectomy, decortication, thoracoplasty

11) Pulmonary Rehabilitation
Definition, aims and objectives, team members, benefits, principles of exercise prescription and techniques of rehabilitation

12) Anatomy and physiology of cardiovascular system
Anatomy, blood supply and conduction system of heart

13) Physiotherapy assessment & management for cardiovascular disorders
Cardiovascular disease, congestive heart failure, myocardial infarction, valvular diseases of heart, cyanotic and acyanotic congenital heart diseases, endocarditis

14) Cardiac Rehabilitation
Definition, aims and objectives, team members, benefits, principles of exercise prescription and techniques of rehabilitation

15) Physiotherapy assessment & management of vascular diseases
Venous: Thrombosis, phlebitis and phlebitis thrombosis, varicose veins, DVT, venous Ulcers
Arterial: Beurger’s disease, acute and chronic arterial occlusion, lymphedema

16) Physiotherapy assessment & management for abdominal surgeries
Operations on upper gastrointestinal tract – oesophagus, stomach, duodenum, operation on large and small intestine – appendicectomy, cholecystectomy, partial colectomy, ileostomy, nephrectomy. Hernia: herniotomy, herniography, hernioplasty

17) Physiotherapy Assessment & management in O&G surgeries
Mastectomy: simple, radical. Hysterectomy, prostatectomy, neck dissection

18) Physiotherapy in Obstetrics
Electrotherapy and exercise therapy measures following pelvic repair, caesarean section

19) Wounds, local infections, ulcers, pressure sores
UVR and other electrotherapeutic modalities for healing of wound, prevention of hypergranulated scars, relief of pain and mobilization

20) Physiotherapy in Burns, skin grafts and re-constructive surgery

21) Physiotherapy in ENT conditions
Nonsuppurative otitis media, chronic suppurative otitis media, otosclerosis, labyrinthitis and mastoidectomy resulting into facial palsy, laryngectomy, pharyngectomy – laryngectomy, tracheotomy and its care, sinusitis

22) Physiotherapy in skin conditions
Leprosy, acne, alopecia, psoriasis, syphilis

23) Physiotherapy in Psychiatric conditions
Schizophrenia, depression, psychosis, anxiety

24) Physical fitness
Energy system, Endurance, Aerobic Exercise, pacing of activity

4. COMMUNITY BASED REHABILITATION & ETHICS

4.1 PHYSIOTHERAPY IN COMMUNITY HEALTH

OBJECTIVES:
At the end of the course, the candidate will be able to
1. Describe the general concepts about Health, Disease & Physical fitness
2. Describe national policies for the rehabilitation of disabled - role of IAP to promote
physiotherapy as a health delivery system
3. Describe the strategies to assess prevalence & incidence of various conditions responsible
for increasing morbidity in the specific community, role of physiotherapy in reducing
morbidity, expected clinical & functional recovery, reasons for non-compliance in specific
community & environmental solution for the same
4. Describe the evaluation of disability & planning for prevention & rehabilitation
5. Describe CBR in urban & rural set up, WHO policies, concept of team work, role of multi-
purpose health worker
6. Identify with clinical reasoning the prevailing contextual (environmental & psychosocial,
cultural) factors, causing high risk of disability, various dysfunctions & morbidity
related to lifestyle & specific conditions like: Seniors, aged, industrial workers & describe
planning strategies of intervention policies to combat such problems.

SYLLABUS:
1) Concepts of community health
   Preventive, promotive, restorative and rehabilitative
   WHO definition of health and disease
   Health delivery system - 3 tier

2) Disability types
   Physical & Psychological Evaluation, prevention & rehabilitation related to Persons with
   Disability (PWD)

3) CBR
   Definition, principles, types (institutional, reach out to community), concepts,
   WHO policies
   Principles of Team work of medical practitioners, Physiotherapist, Occupational Therapist,
   Speech & Audiology Therapist, Prosthetist & Orthotist, Clinical psychologist, vocational
   counsellor and social worker Role of Physiotherapy in team, concept of multipurpose health
   worker, role of Physiotherapy and strategies in 3 tier Health delivery system,
   communication strategies.

4) Health Care
   Prevention, Promotion & Restoration
   1. In peri pubertal age group
   2. In women-pregnancy, menopause
   3. In Geriatrics - neuromusculoskeletal, cardiovascular, pulmonary, metabolic and
degenerative conditions
   4. In Obese / over weight
   5. In Cardiovascular and Pulmonary conditions
   6. In Diabetes
   7. Health promotion for all

5) Women and child care
1. Antenatal exercises, Specific Breathing exercises, Relaxation, Postural training, Pelvic floor strengthening exercises with clinical reasoning
2. Physiotherapy during labor
3. Postnatal exercises program after normal labor / labor with invasive procedures with clinical reasoning
4. Menopause - Osteoporosis, Mental health, Physiotherapy management
5. Preterm babies
6. Adolescent age group
7. Nutritional disorders in women and children
8. Geriatrics
   - Physiology of aging, environmental changes and adaptations, balance and falls
   - Role of Physiotherapy in geriatric population

4.2 ETHICS AND MANAGEMENT

4.2. (A) ETHICS

1. Ethical principles in health care
2. Ethical principles related to physiotherapy
3. Scope of practice
4. Rules of professional conduct
   - Physiotherapy as a profession
   - Relationship with patients
   - Relationship at health care institution, e.g. hospital, clinic etc.
   - Relationship with colleagues and peers
   - Relationship with medical and other professionals
5. Confidentiality and responsibility
6. Malpractice and negligence
7. Provision of services and advertising
8. Sale of goods: personal and professional standards
9. Legal aspects: legal responsibility of physiotherapists for their action in the professional context understanding liability and obligations in case of medico legal action

4.2. (B) MANAGEMENT

1. Basic Principles of Administration and Organization.
2. The evaluation Process and Treatment Planning.
4. Evidence based practice & documentation.

Industrial health
A) Ability Management
   - Job analysis - Job description, ergonomic evaluation, injury prevention
B) Environmental stress in the industrial area
   1. Physical agents e.g. heat / cold, light, noise, vibration, UV radiation, ionizing radiation
   2. Chemical agents - inhalation, local action and ingestion
   3. Mechanical hazards-overuse/fatigue injuries due to ergonomic alternation and mechanical stresses
C) Mechanical stresses in various job related postures and activities
D) Psychological hazards
4.3 BIO-ENGINEERING

OBJECTIVES:-
At the end of the course, the candidate will be able to
1. acquire knowledge about biomechanical principles of application of variety of aids & appliances used for ambulation, protection & prevention
2. acquire in brief knowledge about various materials used for splints/Orthosis & prostheses and selection criteria for splints/Orthosis & Prostheses
3. acquire the skill of fabrication of simple splints made out of low cost material.

SYLLABUS:-
1. Introduction and classification of aids and appliances
2. Biomechanical principles in designing of appliances, material used for fabrication & assessment procedures for static & dynamic alignment of the following Aids & appliances
3. Splints/Orthosis for spine-upper & lower limb, Prosthesis for Lower limbs, Upper limbs
4. Wheel chair prescription
5. Psychological aspects of orthotic and prosthetic application
6. Project – The students may be given a small project to fabricate 1 splint using POP, aluminum strips/sheets/wires, rubber bandage, etc.

5. BIO-STATISTICS & RESEARCH METHODOLOGY

OBJECTIVES:-
At the end of the course the candidate will be able to
1. Recognise different variables as per their type and should be able to decide on how to treat them differently as per requirement
2. Differentiate complete enumeration and various forms of sampling (random: simple, stratified, cluster, multi-stage or randomisation ball, quota, purposive, convenient) with understanding of need and relevance of them
3. Decide when to apply what test or a measure of central tendency according to the need of the data and objective
4. Interpret a given output of regression or ANOVA according to the context.

SYLLABUS:-
1. Introduction to statistical in physiotherapy
2. Understanding ‘Data’ and its types
3. Presentation of various data: tables, graphs and descriptive statistics
4. Measures of central tendencies (CT): mean, median, mode; merits and demerits; when to apply which measure of CT for the given data
5. Measures of dispersion: range, mean deviation, standard deviation, coefficient of variance
6. Application of normal distribution and its properties
7. Testing of hypothesis (measuring change): one sample with population, comparing two samples (Z test for proportion, difference of two proportion, independent sample ‘t’ test, paired ‘t’ test, chi square test
8. Conceptual understanding of correlation, linear and multiple regression, analysis
of variance (ANOVA) and analysis of co-variance (ANCOVA)
9. Complete enumeration and sampling methods: random: simple, stratified, cluster, multi stage; non random: snow ball, quota, purposive, convenient
10. Simple statistical analysis through excel

5 (B) RESEARCH METHODOLOGY

OBJECTIVES:
At the end of the course the candidate will be able to
1. understand and differentiate various study design
2. List the need of methodical and regular literature search in research
3. Plan a study choosing an appropriate design for a given problem according to given objectives.

SYLLABUS:
1. What is research? Why research?
2. Types of epidemiological studies & measurements of various indications.
3. Possible errors that may generate due to study design & how to overcome them.
4. How to read and what to read from journals
5. Role of research in Physiotherapy
6. Components of research proposal – introduction and rationale, material & methods, results and discussion
7. Where to look for good literature and why
8. The Evidence Based Practice