



सत्यमेव जयते



भारतीय पुनर्वास परिषद्

# DIPLOMA IN PROSTHETICS & ORTHOTICS

**D.P.O.**  
**May, 2023**

(w.e.f. 2023-24)

**REHABILITATION COUNCIL OF INDIA**  
*(Statutory Body of the Ministry of Social Justice & Empowerment)*  
Department of Empowerment of Persons with Disabilities (Divyangjan)  
Government of India  
B-22, Qutab Institutional Area  
New Delhi – 110 016  
[www.rehabcouncil.nic.in](http://www.rehabcouncil.nic.in)

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## 1.0 Preamble

Access to prostheses, orthoses, and assistive devices can mediate the process of social inclusion, improve the quality of life for persons with disabilities and anybody having a physical impairment or functional limitations. This will enable them to live healthy, productive, independent, and dignified lives and to participate in education, the labour market, and social life. P&O technology plays a crucial role to mitigate the gap between the common man and the persons who need it.

The UNCRPD and the Sustainable Development Goals (SDGs) are global initiatives that aim to create an inclusive society where everyone can contribute to the country's development. But in India, we are yet to achieve the desired goals due to the lack of awareness, affordability of technologically appropriate prostheses, orthoses, and assistive technology.

The Government of India is putting all efforts to ensure "the approach to improve access to assistive technology and products, including prostheses and orthoses," and everyone should have sufficient access to it.

According to the 2011 census, there are 26.8 million people with disabilities in India, out of which 20% or 5.4 million have locomotor disabilities. Moreover, there are 138 million elderly people who may also require some form of assistive device. Therefore, the total potential demand for assistive devices in India is around 144 million people. To achieve the 2030 Agenda for SDGs, we need to ensure that these devices are accessible and affordable for all.

The aim of the course is to impart training to develop skilled personnel for assembly and fitting of orthopedic appliances, artificial limbs and other assistive devices under the supervision of Prosthetists & Orthotist..

In the light of New Education Policy (NEP-2020) and advancement of technology inclusion of all people including Divyangjan and elderly population are essential for the towards sustainable development. The syllabus is reviewed and restructured as per the guidelines of National Credit Frame Work 2022.

## 2.0 Nomenclature of the Course: Diploma in Prosthetics & Orthotics i.e. D.P.O.

### Objectives:

The principal objective of this course is the training of personnel's as Prosthetic and Orthotic Technician to undertake assembly and fitting of Prostheses, Orthoses and Assistive devices under the supervision of Prosthetics and Orthotics professional.

### **3.0 Scope of the Programme:**

After the completion of the program student will be able to develop following competencies: -

- i) Assembling and fitting of orthoses, prostheses, and assistive devices to the individual under the supervision of Prosthetics and orthotics Professional.
- ii) Various disabilities and associated conditions.
- iii) Legislative provisions and policy guidelines for Divyangjan (PwDs)
- iv) Understanding of various parts of body structure and functions
- v) Understanding of various materials used in Prosthetics and orthotics field

Students can work in both Private and Government Organizations.

### **4.0 General Framework of the Programme:**

#### **5.0 Duration of the course**

Duration of the programme will be of 2 years. Each year will have 1200 hours leading to 40 credits for each year (30 hours = 1 credit). The weightage to the programme will be 60% practical and 40% theory

- i. The first year will comprise of 720 hours of practical and 480 hours of theory
- ii. The second year will also have 1200 hours which will include 720 hours of practical and 480 hours of theory. The theory hours will also include 60 hours of Employability skills (Soft Skills). The resources for the same are freely downloadable at [www.employabilityskills.net](http://www.employabilityskills.net) This will enable and empower the trainees with readiness for applying, working as professionals in supporting diverse students across different setups. The module will also have a weightage of 60:40 of practical and theory with formative assessment at internal and the final exam.

#### **6.0 Eligibility**

Any candidate passed in the Higher Secondary Examination (10+2) in science subject, viz Physics, Chemistry, Biology and English with minimum of 50% marks in each of the core subject will be eligible.

#### **7.0 Medium of Instructions:**

The medium of instruction will be English / Hindi / Regional language.

#### **8.0 Methodology**

The transactional methodology of the programme includes lectures, demonstration, project work, and discussions, visits to different schools / rehabilitation projects, practice teaching, participation in community meetings, medical camps and community development programmes.

#### **9.0 Staff Requirement:**

## Teaching Faculty

Senior faculty in the discipline of Prosthetics and Orthotics shall be considered as course coordinator/ HOD. The coordinator /HOD should be the controlling and informant authority for the correspondence related to the DPO program. He/she should hold qualification as laid down by RCI. The core faculty of DPO program as listed below:

S.No.	Core Faculty	Upto 20 seats	20-30 seats
1.	Assistant Professors (Prosthetics & Orthotics)	02 Assistant Professors	01 Associate Professor (P&O) 02 Assistant Professors (P&O)
2.	Demonstrator (P&O) / Tutor (Prosthetist & Orthotist)	02	03

**Guest Faculty**—As per Requirement

### 10.0 Intake capacity:

The intake for each year of the course will be 35 maximum.

### 11.0 Minimum Attendance:

Eighty per cent minimum attendance is required both in theory and practical to be eligible to appear in the examination.

### 12.0 Examination Scheme

The programme shall follow the NBER Scheme of Examination and norms from time to time. Annual Program with Continuous Assessment and Term End examination will be followed.

**Criteria of Passing:** As per NBER norms,.

**Award of Degree:** Diploma Prosthetics & Orthotics As Awarded by NBER

### 13.0 Infrastructure requirements:

**Clinical Infrastructure (as applicable):** Should be attached with Rehabilitation Institute / Hospital with minimum 30 Prosthetics, Orthotics and Assistive Devices Cases per month.

**Physical Space required (Classrooms/labs/therapy rooms/seminar halls etc as and when applicable):**

S.No.	Name	Minimum size in Sq.Ft.
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1.	Classrooms(01NUMBERS) with audio-visual facility	02 x 300= 600
2.	One room for clinical meeting	300
3.	One trial fitting rooms	150
4.	One measurement rooms	150
5.	Prosthetic Lab	500
6.	Orthotic Lab	500
7.	Prosthetics & Orthotics faculty rooms	150
8.	Two students common room (One for male & one for female students)	300
9.	One Office Room	150
10.	One course coordinator room	150
11.	Computer Laboratory Room	300
12.	One Store room	400

**Equipment required (As applicable for the programme):**

S.No.	Name of Equipment	Minimum Requirement
1.	Hot Air Oven, Heating Chamber Size-36'' Wx24''Dx30''H, With Double Layer Toughened Front Visible Glass With Inside Light Arrangement, Max Temp. 350degree C 12 Kw Rating And 1 Hp3 Phase Motor For Fan With Digital Timer Thermostat Temp Controller.	01
2.	Polisher Converted To Cone Sanding, 2 Hp3PhaseMotor	01
3.	Infrared Oven (Optional)	01
4.	Bench Grinder Cum Sander, 0.5 Hp Single Phase Motor, Abrasive Wheel Size 10'' X1''	01
5.	Pillar Drilling Machine, Drilling Capacity 25mm, and Pillar Dia 87mm Max. Distance Spindle To Table 600mm, Table WorkingSurfaceDia400mmWith1hp3Phase Motor	01
6.	Bench Drilling Machine With Sand, Capacity½''	01
7.	Industrial Leather And Canvas Sewing MachineWith¼''HpMotor	01

8.	Adjustable Circular Saw, Circular Saw Dia 18", Working Table Size 24"X36", MaxDepthofCut5½" With 3hp 3Phase Motor	01
9.	Belt And Disc Sander, Disc Dia. 10", Belt Size6"X48" With 1Hp 3Phase Motor	01
10.	All-Purpose Saw, Temperature Range 100-600Degrees C, Power Input 2000w	01
11.	Hot Air Gun, Temperature Range 100-600 Degree C, Power Input 2000w	01
12.	Jig Saw Machine, Sawing Depth In Wood 54mm, Rated350w	01
13.	High vacuum machine with ¼" hp motor	01
14.	Removable mandrills	03
15.	Mandrill for air suction mounting and draping for sockets	03
17.	Hot water bath for softening low temperature thermoplastic sheets	01
18	Draping frame size (small)	02
19.	Draping frame size (large)	02
20.	Adjustable / fixed grinding and milling Machine with dust collector	01
21.	Sanding roll	02
22.	Sanding sleeve	02
23.	Sanding drum	02
24.	Tool holder	05
25.	Deep drawing tool set	02
26	Rasp head	01
27.	Hot sealing iron	02
28.	Staple gun	02
29.	Hand drill machine	04
30.	Cord less hand drill machine	02
31.	Instrumented gait analyzer and trainer (Optional)	01
32.	Shoe finishing machine	01
33.	Working Table With Peg Board (Minimum 12 tables are required for 24students)	12
34.	Over locking machine	01
35.	Laser aligner	01
36.	Lathe machine	01

37	Inter-locking machine	01
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### 13(ii) LIST OF TOOLS AND EQUIPMENT REQUIRED

S.No.	Name of Equipment tool	Minimum Requirements
1.	Flat file bastard 2 <sup>nd</sup> cut 10", 2 <sup>nd</sup> cut 12"	10
2.	Aluminum Flat File 10" & 12"	10
3.	Round file 6", 8", 2 <sup>nd</sup> cut	10
4.	Flat file 10" round 2 <sup>nd</sup> cut	10
5.	Triangular file 6", 10" 2 <sup>nd</sup> cut	10
6.	Rasp file half round 10", 12", 8"	10
7.	Rasp file flat 10", 12"	10
8.	Rasp file round 6", 10"	10
9.	Screw driver 150x6mm, 200x8mm, 250x8mm	10
10.	Flat chisel 12mm, 20mm, 25mm	02
11.	Cold chisel 12mm, 20mm	02
12.	Half round chisel 12mm, 20mm	02
13.	Ruler steel 600mm, 300mm	02
14.	Steel square with leg 200mm	02
15.	Caliper inside/outside 200mm	02
16.	Compass/Driver 200mm Outside/ inside caliper	02
17.	Hammer ballpeen 500gms, 250gms	10
18.	Mallet hammer with handle	02
19.	Hammer seaming plier (pincer) 10", 12"	04
20.	Nipper 150mm, 200mm	02
21.	Plier 200mm	10
22.	Long nose plier 150mm	10
23.	Revolving Hole punch 250gms	10
24.	Centre punch	10
25.	Hole punch 2mm, 3mm	03
26.	Hole punch set	02
27.	Scissor 10" & 12"	10
28.	Hacksaw Frame 300mm	10
29.	Hacksaw blades 300mm	1pkt
30.	Tapset 3,4,5,6,7mm	02
31.	Tap handle	02
32.	Grip plier	10
33.	Dieset 3,4,5,6,7,.... mm	02



34.	Cross pein hammer	10
35.	Wire cutter	10
36.	Measuring tape	10
37.	Shoe maker hammer	05
38.	Anvil	02
39.	Half round leather Knife(Rapi)	05
40.	Nipper shoe maker8"	05
41.	Leather knife	02
42.	Bender brace5.5mm	01
43.	Bender brace6.5mm	01
44.	Cone sander fine, medium, coarse	10
45.	Plaster knife	10
46.	Upper Limb Prosthetic Kit (B/E,A/E, S.D) body powered	02
47.	Externally powered kit (B/E&A/E)	01
48.	Vice limb maker (modified)	01
49.	Bending fork (Set of two pieces)	02
50.	Caliper A-P measurement above knee	02
51.	Ear Protector	05
52.	Nut replacement tool 7mm, 9mm	02
53.	Heat proof gloves	4 pairs
54.	Copper rivets ¼", ½"	1kg each
55.	Aluminium rivets ¼", ½"	1kg each
56.	Eye let punch	10
57.	Rivet head finishing punch	10
58.	Plastic D-rings 1", 1½" & 2"	5pkts each
59.	Buckles 1", 1½' & 2"	5pkts each
60.	Micrometer	02
61.	M-L caliper /ALIMCO B. K. caliper	02
62.	Allen keys/T-handheld Allenkeys( 1mm-10mm)	10set
63.	Press button	5 pkts
64.	Evathenefoam4mm,6mm,8mm Thickness	5 sheets each
65.	Polypropylene and copolymer sheets( white)3mm, 4mm & 5mm thickness	5 sheets each
66.	Dendrite solution	5 ltr (5tin)
67.	Velcro straps (hook & loop)¾",1"and 2"	2 roll each
68.	Nappa leather	5000 d/m
69.	Low temperature thermoplastic sheets	5 sheets each

	3.2mm/4.2mmthickness	
70.	Aluminum strips(4mm) thickness	05 kg.
71.	Aluminium sheet (4mmthicknes),1 mm=18gauge(BSW)	02 sheet
72.	Drill bits, Full Set Max diameter (7/64",1/8",9/64",5/32",3/16",11/64",1/4",3/8", 1/2")	01set
73.	Different modular system for lower limb Prostheses	5set each
74.	Torque wrench	01
75.	Bench Vice	10
76.	Vernier Caliper (digital)	10

#### LIST OF TOOLS AND EQUIPMENT REQUIRED – PLASTER MODIFICATION AREA

S.No.	Name of Equipment	Minimum Requirement
1.	Plaster Work Table	02
2.	Plaster Cast Shelf	01
3.	Pipe Vice	05
4.	Plaster Bucket	05
5.	Mixing Bowl	20
6.	Plaster Stirrer	20
7.	Sur form File Flat	20
8.	Surform File Round (Blade Only)	15
9.	Surform File Half Round (Blade Only)	15
10.	Plaster Spatula	15
11.	Tape Measure	10
12.	Goniometer	05
13.	Special Plaster Knife	05
14.	Draw Knife	02
15.	Plaster Cutting Scissors	04
16.	Mandrills	20
17.	Plaster Separation Sink	01

#### 14.0 Library Facilities

A well equipped library consisting the students textbooks on Prosthetics, Orthotics, Rehabilitation Medicine, Physiotherapy, Occupational Therapy, Bio- mechanics, Bio-engineering, Bio-electric, electrical, mechanical, electronics, plastics, leather and basic subjects like anatomy, physiology, biology, mathematics, pathology, orthopedics, amputation surgery, medical dictionary, etc. is required for the Institutions which teaches Prosthetics and Orthotics.

A collection of anatomical, physiological charts, articular and disarticular skeleton, audio & visual aids like slides, video films etc. are needed. Audio / Video equipments like slide projector, 16 mm sound projector, overhead projector / LCD projector, epaediastroscope are also required for use as teaching aids.

a Periodicals and journals on prosthetics, orthotics, Rehabilitation Medicine, Bio- engineering etc. are to be kept in the library. (A list of books and periodicals and journals are enclosed in Appendix-1).

### 15.0 Registration as Personnel/Professional and Category of Registration:

It is mandatory for every rehabilitation professional / personnel to obtain a “Registered Personnel/ Professional Certificate” from the Rehabilitation Council of India to work in the field of disability rehabilitation and special education in India. A Student who has attended the training and completed the requirements for all modules successfully will be qualified as a **Prosthetist and Orthotist - Personnel** and be eligible to work in the field of Rehabilitation in India as a **Prosthetist and Orthotist Technician**. As continuous professional growth is necessary for the renewal of the certificate, the rehabilitation professional / personnel should undergo in-service programme periodically to update their professional knowledge. Each registered professional/personnel will be required to get himself /herself renew his registration periodically. The periodicity will be decided by the council from time to time. The activities for enrichment training programmes in the form of Continuous Rehabilitation Education (CRE) is decided by the RCI

### 16.0 Coursewise Hours and Marks

#### Course Outline

#### FIRST YEAR

S. No.	Name Of Subject	Hours (Theory)	Hours (Practical)/ Demonstration	Total hours	Credit Points	Internal assessment marks	External assessment marks	Total Marks
1.	Life/Basic Science— Anatomy, Physiology and Pathology	120	30	150	05	40	60	100
2.	Workshop Technology Practice & Elementary Material Science	60	30	90	03	40	60	100
3.	Applied Mechanics & Strength of Material, Electronics & Bio-	90	-----	90	03	40	60	100

	Electricity							
4.	Orthopedics, Amputation Surgery Kinesiology & Bio-Mechanics	90	-----	90	03	40	60	100
5.	Prosthetics Lower Extremity Prosthetics	60	---	--	02	40	60	100
6.	Orthotics Lower Extremity Prosthetics	60	--	--	02	40	60	100
7.	Prosthetics Lower Extremity Prosthetics (Practical)	---	330	330	11	40	60	100
8.	Orthotics Lower Extremity Prosthetics (Practical)		330	330	11	40	60	100
		480	720	1200	40	320	480	800

**Note:** Practical Examination will be conducted only in the discipline of Prosthetics and Orthotics

**No. of Theory papers = 6**

**No. of Practical papers = 2**

## SECOND YEAR

S. No.	Name Of Subject	Hours (Theory)	Hours (Practical)	Total hours	Credit Points	Internal assessment marks	External assessment marks	Total Marks
1.	Introduction to PMR, Rehab Psychology, Physiotherapy, Occupational Therapy, Vocational guidance etc	120	30	150	05	40	60	100
2.	Prosthetics Upper Extremity	60	--	60	2	40	60	100
3.	Spine and Upper Extremity Orthotics	90	--	90	3	40	60	100
4.	Introduction to Disability, CBR and ICT Workshop Admn. & Management	90	----	90	03	40	60	100
5.	Fundamentals of	60	60	120	04	40	60	100

	<b>research, report writing Educational tour &amp; Assistive Technology</b>							
<b>6.</b>	<b>Employability skills</b>	<b>60</b>	<b>---</b>	<b>60</b>	<b>02</b>	<b>40</b>	<b>60</b>	<b>100</b>
<b>7</b>	<b>Prosthetics Upper Extremity (practical)</b>		<b>300</b>	<b>300</b>	<b>10</b>	<b>40</b>	<b>60</b>	<b>100</b>
<b>8</b>	<b>Spine and Upper Extremity Orthotics (practical)</b>		<b>330</b>	<b>330</b>	<b>11</b>	<b>40</b>	<b>60</b>	<b>100</b>
		<b>480</b>	<b>720</b>	<b>1200</b>	<b>40</b>	<b>320</b>	<b>480</b>	<b>800</b>

**Note:** Practical Examination will be conducted only in the discipline of Prosthetics Upper Extremity and Spine and Upper Extremity Orthotics

## PAPER I

### LIFE/BASIC SCIENCE –ANATOMY, PHYSIOLOGY & PATHOLOGY

Teaching Hours:150 (Theory-120, Demonstration-30)

Credits: 05

#### Detailed Contents

S. No.	Topic Breakdown
1.	Introduction to human body terminology used.
2.	The skeleton classification of bones, terms used in describing bones
3.	The skull
4.	The Thorax
5.	The Vertebral Column
6.	The Pelvic girdle
7.	The skeleton of upper Limb Scapula, Humerus, Ulna, Radius, Bones of wrist & hands
8.	The skeleton of Lower Extremity. The innominate bone, femur, Patella, Tibia, Fibula Bones of the foot.
9.	The Joint of the Skeleton classification & Types
10.	Joints of Upper Extremity
11.	Joints of Lower Extremity, Knee, Ankle & Joints of the foot.
12.	Myology – the muscle of the skeleton, Name of Muscles & their derivation.
13.	Muscle of the head & face- Position, attachments, action & nerve supply
14.	Muscle of the neck, Position, attachments, action & nerve supply.
15.	Muscle of the Chest- Position, attachments, action & nerve supply
16.	Muscles of the Back – Position, attachments, action & nerve supply
17.	Abdominal muscles- Position, attachments, action & nerve supply
18.	Muscle of the Upper Extremity- Position, attachments, action & nerve supply
19.	Muscles of the Lower Extremity- Position, attachments, action & nerve supply
20.	Anatomical regions formation & contents of Axilla, axillary fossa, anterior & posterior triangle of neck, femoral triangle, popliteal space
21.	Living anatomy – recognition of structure in living body by inspection & palpation.
22.	Ability to replace the surface of the living body, the position of the chief structures

## Reference Books

1. Gray's Anatomy
2. Gate's Primary Anatomy
3. Anatomy & Physiology for Nurses By V.E. Pearce

## Notes

1. Each topic should be taught with Articular skeleton and disarticulated bones- charts also can be used.
2. Manuals for study to be prepared and given to students.
3. For field work, the students are to be taken to Anatomy Department of a Medical College for visit and demonstration to be given.

## Physiology

S.No	Topic Breakdown
1.	Introduction to physiology & different systems of the body
2.	Body fluids, tissue cells, cytoplasm, nucleus, irritability, conductivity, reproduction.
3.	Elementary tissue of the body & their functions development & growth of bones
4.	The circulatory system – Heart, Blood vessels attached to it & nerve supply of the heart, cardiac cycle of the heart, cardiac cycle, the heart sounds, the pulse, blood pressure, the cardiac output, circulation of blood throughout body, Principal blood vessels, arteries & veins.
5.	The blood composition of blood & functions –the coagulation of blood.
6.	The spleen & the Reticula Endothelial system
7.	The classification of food
8.	The digestive system
9.	The liver & pancreas
10.	The respiratory system and respiration
11.	Metabolism
12.	Endocrine glands.
13.	Urinary system
14.	Reproductive system
15.	The nervous system – sympathetic, parasympathetic
16.	Organs of special senses and skin

**Reference Books: -**

Anatomy & Physiology for Users by Evlyn Pearch.

**Pathology**

S.No	Topic Breakdown
1.	Introduction to pathology, General pathology
2.	Inflammation – signs and symptoms – types of inflammation, Acute & Chronic inflammation
3.	Infections – Bacteria and viruses, immunity, types, classification, control of infection, crossinfection & prevention. Asopsis and sterilization, pyogenic infection – boils, abscess setticamla, Tuberculous infection of bones & joints & management. Fungle infection – actiriomycosis, filariasis, leprosy, veneral disease syphilis, gonorrohea, virusinfection – poliomyelitis influence.
4.	Wounds – types of healing process
5.	Gangrene – types, causes, signs & symptoms and management.
6.	Inflammation of joints – Arthritis – classification and pathology

**Reference Books**

Text book of the Practice & Medicine



**PAPER II**  
**WORKSHOP TECHNOLOGY PRACTICE & ELEMENTARY MATERIAL SCIENCE**

Teaching Hours: 90 (Theory-60, Demonstration-30)

Credits: 03

**CONTENTS**

S. No.	Topic Breakdown
1.	Introduction to workshop technology
2.	Bench work-bench vice, leg vice, hand vice, hammers of different types, Files of various types, Chisels, Scrappers & their uses. Hack saws, wrenches, surface plate, angle plate, V-block Centre Punches, dividers & trammels, feeler & surface gauges, etc.
3.	Measuring Tools – scales & tapes, calipers, Micrometer, Vernier calipers, gauges, plug gauges, dial gauges, transducers sine bars, indicators.
4.	Fundamentals of transducer soldering, brazing and welding.
5.	Forging (blacksmithy) –the forge & tools used in smithy & forging processes.
6.	Drilling-Machine operation, tools holding devices, types of drill, reamers and uses, cutting internal- external threads, by using taps and dies, counter sinking, counterboring.
7.	Lathe work-parts of centre lathe and their uses, turning of centre, taper turning screw cutting in lathe, cutting tools used in lathe, tools speed, feed and depth of cut.
8.	Milling types of milling machines, Milling cutter, Up-cut & cone cut milling dividing head, set-up and operation on milling machine
9.	Shaping – Shaping machine and their use.
10.	Grinding – The grinding wheels, abrasives, wheel bonds, grit & grade, wheel structure, shape, selection, hand grinders, speed & feed, types of grinding & different types of grinding machines.
11.	Finishing process polishing, buffing, electroplating, copper, nickel and chromium.
12.	Material & Tools used in Prosthetics & Orthotics; - a. Rubber- different types uses, density, resilience, utility in prosthetic & Orthotics

	b. Plastics-types, strength impregnation, lamination colouring & utility:
	c. Ferrous metals – Steel variety & uses
	d. Non-ferrous metals and alloys, aluminum, various suitability.
	e. Fabrics
	f. Leather
	g. Plaster of Paris
	h. Adhesive & Fasteners
	i. Special tools & equipment's used in prosthetic & orthotic work

Notes: - 1. Lecture should follow by demonstration of use of tools and equipments.

Reference Books: -

1. Tools & Materials for Prosthetists
2. Tools & Materials for Orthotists N.Y.U. Publication

Workshop Technology & Practice – By Chapman

**PAPER III**  
**APPLIED MECHANICS & STRENGTH OF MATERIAL, ELECTRONICS,**  
**BIO-ELECTRICITY**

Teaching Hours: 90

Credits: 03

**Content**

S.No.	Topic Breakdown
1.	Simple stress & strains Definition of stress and strains, factor of safety, safe stress, modulus of elasticity, longitudinal strain and lateral strains, Poisson's ratio, etc. –
2.	Geometric properties of sections Definition of moment inertia & radius of gyration of a solid body. Definition of centroid, moment of inertia of sections, determining of centroid of 'L' section,
3.	Shear Stress & Bending moments Classification of beams, types of loads, definition of shear force & bending moment of a loaded beam
5.	Torsion Definition of torsion, angle of twist, polar moment of inertia etc. assumption made in torsion,
6.	Springs Types of springs, uses of various springs, development of formulae for stiffness & deflection of closely coiled helical springs – simple problems.
7.	Riveted Joints Types of riveted joints, strength of joints,
8.	Friction Principles of friction – coefficient of, definition of static & dynamic friction, laws of static friction, least force required to drag a body on horizontal plane, angle of repose frictional force on inclined plane simple problems.

## Electronics & Bio-Electricity

S.No.	Topic Breakdown
1.	Fundamental of Electricity Ohm's Law. Resistance in Parallel & series AC + DC resistance capacitance, impedance-power, powerfactor, transformers, meters
2.	Elements of Electronics Vacuum tubes, Diode, Electrode, Tetrode, Pentode, Electrification, valve as rectifier valve as amplifier semi-conductors, integrated circuit, computers.
3.	Bio-Electricity Biological potentials, muscle action potentials, electromyography, myoelectricity control of artificial arms, Bio-cybernetics.

### Reference Books: -

1. Biological & Medical Electronics by Ralph. W. Stach, Ph.D. London.
2. Bio-electricity by E.E. Svek / Ling D.E.E.

**PAPER IV**  
**ORTHOPAEDICS, AMPUTATION SURGERY, KINESIOLOGY & BIO-MECHANICS**

**Teaching Hours: 90**

**Credits: 03**

**CONTENTS**

S.No.	Topic Breakdown
1.	Introduction to Orthopaedics
2.	Principles of Orthopaedics
3.	Congenital deformities
4.	Diseases of Nervous System
5.	Poliomyelitis
6.	Obstetrical paralysis
7.	CP
8.	Hemiplegia
9.	Paraplegia
10.	Pyoemic infection
11.	Tuberculosis
12.	Leprosy
13.	Chronic arthritis
14.	Rheumatoid arthritis
15.	Osteoarthritis
16.	Neuropathic arthritis
17.	Metabolic diseases
18.	Rickets
19.	Avitaminosis
21.	Bone tumours
22.	Trauma
23.	Fractures upper extremity
24.	Fracture lower extremity
25.	Spine fractures and dislocation

**Reference Book:** - Outline of Orthopaedic by Adams

**Note:** Demonstration should be made with case as far as possible. Visual aids should be shown with each lecture.

### **Amputation**

S.No.	Topic Breakdown
1.	Introduction to amputation surgery – indications
2.	Principles of amputation, types, techniques.
3.	Amputation in children (Upper & LowerExtremity)
4.	Amputation in adults (Upper extremity) and itscomplications (various levels)
5.	Amputation in lower extremity & itscomplications (various levels)
6.	Postoperative care of the stump properties of goodstump.
7.	Examination & prescription
8.	Stump dermatology
9.	Common skin diseases and their management
10.	Care of Stump
11.	Latest techniques of amputation Myodesis – Myoplasty

### **Notes: -**

1. Topics should be covered in a simple manner to the required extent of knowledge required by a Prosthetist.
2. Presentation of cases, charts, slides and other mode of teaching aids are requiredfor demonstration to students.
3. Student may be taken to an operation theatre for observation of performance of anyone amputation surgery.

### **Kinesiology & Bio- Mechanics**

S.No.	Topic Breakdown
1.	Definition of Kinesiology & Bio-mechanics
4.	Definition of Kinetics & Kinematics
5.	Centre of gravity of human body.
6.	Segment masses & the density of parts.
8.	Segment of centres of gravity
9.	human movements & its significance
10.	Forms of human movement their characteristics &factors affecting them.
11.	Analysis of movement.

12.	Body links and motion of parts.
13.	Closed chain systems.
14.	Open chain system.
15.	Four bar mechanism.
16.	Measurement of joint motion.
17.	Electrogonio-metric method
18.	Mechanics of the spine
19.	Lumbar discometry
20.	Human Locomotion
21.	Bio-mechanics of lower extremity
22.	Bio-mechanics of upper extremity

**Note:** -The Bio-mechanics of various types of prosthesis and orthosis are included in the syllabus of the respective subjects in subsequent semesters.

## PAPER V

### LOWER EXTREMITY PROSTHETICS (THEORY)

Teaching Hours: 60

Credits: 02

#### CONTENTS

S.N.	Topic Breakdown
1	Levels of amputation & limiting factor (lower extremity)
2	Psychological aspects of amputation
3	Classification of congenital skeletal limb deficiencies.
4	Prosthetic / Orthotic assessment and evaluation techniques
5	Prosthetic prescription
6	Immediate & early Prosthetic management
7	Prosthetic components below knee & above knee
8	Examination of stump, measurement, cast taking POP modification, fabrication, alignment & fitting procedures for below knee & above knee amputations (this include prosthesis for partial foot, choparts, syme's below knee, through knee above knee amputations.
9	Gait analysis of BK/ AK amputees fitted with prostheses.
10	Check out of below knee & above knee prosthesis
11	Maintenance & care of prosthesis
12	Hip disarticulation & Hemipelvectomy prosthesis
13	Bio-mechanics of below knee, above knee & hip disarticulation prosthesis
14	Fluid controlled prosthesis
15	Modular & other modern types of prosthesis
16	Development of squatting type prosthesis – Madras & Jaipur port, etc,
17	Study of publication of sources for updating information on L.E. Prosthesis Examination



**PAPER VI**  
**LOWER EXTREMITY ORTHOTIC (THEORY)**

Teaching Hours: 60

Credits: 02

**Detailed Contents**

S.No.	Topic Breakdown
I	Anatomy of Foot
II	Orthotic – Prescription for different pathological condition, pathomechanics of foot & ankles.
III	Shoes, boots & their components
IV	Shoe modifications, principles & procedures in clinical application
V	Biomechanics of the foot
VI	Pathomechanics Lower extremity (including foot, ankle, knee and hip.)
VII	Introduction to Orthotic management
VII I	Lower extremity orthotic components & functions.
IX	Principles of taking measurements, selection of components, fabrication, alignment fitting and check-out of orthoses.
X	The influence of error in bracing upon deformity of lower extremity
XI	Analysis of Pathological & orthotic gait

**Reference Books**

1. Atlas of Orthoses published By A.A.O.S.  
Manual of L.E. Orthoses by N.Y. University

# LOWER EXTREMITY PROSTHETICS

## (PRACTICAL)

**Teaching Hours: 330**

**Credits: 11**

**Course Description:** This should include the supervised manufacture and fitting of all common devices and at least exposure to the range of devices not routinely seen in clinical practice.

The student should be able to meet the following learning objectives:

- Construct the device using appropriate fabrication techniques in preparation for the initial fitting.
- Fit the device to the patient using static and dynamic functional criteria established from the original assessment.
- Identify problems related to device fit and/or alignment and be able to suggest and implement appropriate correction.
- Communicate effectively with patient, co-workers, and other health care professionals in such a manner that will ensure the highest quality of service and reflect a professional attitude on the part of the student.
- Educate the patient / client and/or caregiver on use, care and function of the device.
- Understand the methodology of problem identification, problem solving in a process that includes all stake holders, with the client at the centre.

### **Prosthetics Practical:**

1. Taking case history of a minimum of 10 individuals / Patients
2. Fabrication of Prosthetic Feet,
3. Assessment, casting & fabrication of Partial foot prosthesis on model / mannequins
4. Assessment, casting & fabrication of Chopart Prosthesis on model / mannequins
5. Assessment, casting & fabrication of Symes Prosthesis on model / mannequins
6. Assessment, casting & fabrication of Trans-tibial prosthesis, Knee Disarticulation and Transfemoral prosthesis on model

# LOWER EXTREMITY ORTHOTICS

## (PRACTICAL)

**Teaching Hours: 330**

**Credits: 11**

**Course Description:** This should include the supervised manufacture and fitting of all common devices and at least exposure to the range of devices not routinely seen in clinical practice.

The student should be able to meet the following learning objectives:

- Construct the device using appropriate fabrication techniques in preparation for the initial fitting.
- Fit the device to the patient using static and dynamic functional criteria established from the original assessment.
- Identify problems related to device fit and/or alignment and be able to suggest and implement appropriate correction.
- Communicate effectively with patient, co-workers, and other health care professionals in such a manner that will ensure the highest quality of service and reflect a professional attitude on the part of the student.
- Educate the patient / client and/or caregiver on use, care and function of the device.
- Understand the methodology of problem identification, problem solving in a process that includes all stake holders, with the client at the centre.

### **Practical:**

1. Taking case history of Patients
2. Assessment, Evaluation & fabrication of Different types of foot Orthoses on model / mannequins
3. Assessment & Evaluation of Shoe modifications
4. Assessment, casting & fabrication of all types of Mechanical Ankle Joint, conventional& Custom moulded (A.F.O.) on model.
5. Assessment, casting & fabrication of functional fracture Orthosis for below knee on model .

**II Year**

**PAPER VII**

**INTRODUCTION TO PMR, REHAB PSYCHOLOGY, PHYSIOTHERAPY,  
OCCUPATIONAL THERAPY, VOCATIONAL GUIDANCE**

**Teaching Hours: 150**

**Credits: 05**

**Detailed Contents**

S.No.	Topic
1.	Introduction to Physical Medicine & Rehabilitation.
2.	Muscle charting
3.	Electro-therapy
4.	Hydro-therapy
5.	Application of the above topics in management of disabling conditions
6.	Neuro muscular diseases type and management
7.	Arthritis, types and management
8.	Crutches & uses, different mobility and assistive devices
9.	Bandaging of stumps, BK/AK etc. Knees, Elbows, Hands, Wrists and Ankles.
10.	Gait training & analysis of patients fitted with orthoses & prostheses
11.	Prescription of appliances.
12.	Introduction to the subject
13.	Visit to various department, of the institution.
14.	General idea & definition of prosthetics / orthotics
15.	Function of different sections / departments of the institute
16.	Rehabilitation a. Concept of Rehabilitation b. Total Rehabilitation Rehabilitation team and role of each member of the team.
17.	Psychology of disabled Goals & methods of scientific psychology
18.	Normal personality, normal growth & development Heredity, Maturation

19	Environment & Learning factors in intellectual & Social Development.
20	Psychometry Testing & motivation
21	Emotional life of the disabled & psychological assessment
22	Counselling
23	a. Social & Vocational Aspects, Disability & social effects, Home environment of disabled
24	CBR – concept and application, Attitude of the society
25	Vocational problems, Vocational assessment, Vocational counselling and guidance, Follow up

### Reference Books

- Psychology by Munn N.L.
- Development Psychology – by Hurlock E.B.
- Child Development – do –
- Rehabilitation Medicine – by Howard A.Rusk
- Rehabilitation Medicine – by P.J.R. Nicholas
- Workshop for the disabled – by Chownard E.L. & Gay
- Psychology Testing – by Anastasi A.
- Abnormal Psychology – by Brown
- Educational Psychology – by Grow & Grow.

Journal: -

Journal of Rehabilitation in Asia Published by Indian Society for Rehabilitation of Handicapped.

**PAPER VIII**  
**PROSTHETICS UPPER EXTREMITY (THEORY)**

Teaching Hours: 60

Credits: 02

**Contents**

S.N.	Topic Breakdown
I.	Classification by level of amputation.
II.	Medical consideration applied anatomy and pathological consideration
III.	Classification of congenital skeletal limb deficiencies
IV.	Prosthetic prescription
V.	Amputee trainee
VI.	Components of upper extremity prostheses, control & harness systems.
VII.	Fabrication principle & procedures for upper extremity prostheses.
VIII.	Measurement fitting & alignment
IX.	Check-out & care of B.E. prostheses.
X.	Biomechanics of U.E. prostheses.
XI.	Harness & control systems Below Elbow harnessing & this causes, shoulder amputee harnessing.
XII.	Clinical aspects of U.E. prosthesis
XIII.	Training in the use of U.E. prosthesis
XIV.	Electro-mechanical myoelectric and other externally powered prostheses
XV.	Study of publication sources for updating information on upper limb prostheses

## PAPER IX

### SPINE AND UPPER EXTREMITY ORTHOTICS (THEORY)

Teaching Hours: 90

Credits: 03

#### Contents

S.No.	Topic Breakdown
I.	Surface of anatomy of trunk
II.	The Physiological basis of Orthotic. Methods
III.	Orthotic treatment of lumbar & thoracic conditions
IV.	Orthotic treatment of cervical condition
V.	Spinal Orthotic prescription, The M.W. brace, exercises for users of M.W. Braces, Boston brace
VI.	Functional Anatomy of hand
VII.	Measurement, selection of materials & components, fabrication & fitting of the following: (i) Static fingers hand splints. (ii) Functional hand splints (iii) Functional arm braces (iv) Feeders (v) Special assistive devices Myoelectric & other externally powered upper extremity orthoses
VIII.	How to train the patients to use functional splint & arms braces
IX.	Biomechanics of splints and braces

#### Reference Books: -

1. Upper Extremity Orthosis – Miles. H. Anderson.
2. Manuals of U.E. Orthosis- N.Y. University.
3. AAOS atlas of Orthosis and assistive devices,

## PAPER X

### INTRODUCTION TO DISABILITY, CBR AND ICT WORKSHOP ADMINISTRATION & MANAGEMENT

Teaching Hours: 90

Credits: 03

#### Course Objective:

The student should understand the basic terminologies in disability, CBR and ICT.

#### Learning Objectives:

Understand disability and the various concepts of CBR and ICT.

#### Contents

S.NO	TOPICS
I.	<b>ICT:</b> <b>Hardware:</b> C.P.U, monitor, keyboard, mouse, Laptop , tablet, touch screen, Mobile phones, Smartboard, Printer, U.P.S, USB disk, Wifi, Projector, computer Scanner, photocopy machine, calculator
II.	<b>Software:</b> OS, App, AI tools, browser, anti-virus, desktop publishing software: open office (word, excel, powerpoint), notepad. File format: text formats txt, Pdf, docx, xlsx, pptx, .stl, .obj Assistive software and technology for PwD.
III.	<b>Medical Devices:</b> Digital medical devices like Digital Glucose meter, Digital oxygen meter, digital blood pressure meter, digital thermometer, Digital weight machine, etc.
IV.	<b>Internet:</b> Search engine, open source resources, online resources, Email, Digital wallet, SMS, OTPs, App, No code programming Eg: Drag and drop programming <b>Picture editing s/w:</b> photos/pictures: jpg, .png <b>Movie editing s/w:</b> video: .mpg, .avi
V.	<b>CBR skills:</b> Art & craft based on Local culture/heritage Jewellery making Bag/ Basket making (recycled or not) Handmade paper/books Tailoring Weaving Wood/ Bamboo gifts



	Candle / Agarbhatti / Soap making Rice husk /sugarcane/coal brickette (fuel pods)
<b>VI.</b>	Disability: 21 Disabilities as the RPwD Act
<b>VII.</b>	Workshop administrative and managementstructure
<b>VIII.</b>	Foremanship & Duties of forman & qualities of forman
<b>IX.</b>	Store & Store Organisation Purpose of store keeping, store location, layoutof stores, systems of location of materials,methods of storing Biocard, Indent of stores material returned, Accounting of stores, registers,advantages of good stores keeping.
<b>X.</b>	Purchase procedures Functions of purchase department, methods ofpurchasing, purchase procedures.
<b>XI.</b>	Cost Accounting Closing of job cards and work orders
<b>XII.</b>	Accident Hazards and Industrial Safety Introduction to safety and management function,basic principles of accident prevention, Physicaland Psychological factors in safety, occupationalhygiene and health, safety in engineering &industry safety in prosthetic & orthotic workshop
<b>XIII.</b>	First Aid, Wounds, antiseptics, bandages, splints, and theirpractical uses, care of injured cares
<b>XIV.</b>	Practical demonstration of handling thecasualties of various types.
<b>XV.</b>	Artificial respiration, practical demonstration
<b>XVI.</b>	Practical demonstration or external cardiacmessage.
<b>XVII.</b>	Transportation of Causalities

## PAPER XI

### FUNDAMENTALS OF RESEARCH, REPORT WRITING, CASE PRESENTATION, EDUCATIONAL TOUR and ASSISTIVE TECHNOLOGY

Teaching Hours: 120 (Theory-60, Demonstration—60)

Credits: 04

#### Contents

Students should visit P&O and allied industries (min two) and submit the report to the coordinator. Based on the report of visit the grade/marks will be given.

S.No	Topic Breakdown
1.	Clinical observation
2.	Presentation of orthotic fitment cases(lower Ext)
3.	Presentation of Orthotic fitment cases (upper and spinal)
4.	Presentation of Lower Extremity Prosthetic cases
5.	Presentation of Upper Extremity. Prosthetic cases
6.	Introduction to Biostatistics Definition – Statistics, Biostatistics Applications of Biostatistics Data collection from experiments & surveys. Variable – Qualitative & Quantitative, Discrete and continuous. Presentation of Data: - a) Tabular Presentation of Data – Statistical Table, Format of a Table
7	Introduction to Research methodology: Meaning of research, objectives of research, Types of research & research approaches, Methods of data collection
8	Mobility and Walking aids: Canes, walking sticks, Crutches - auxiliary, elbow and forearm support. Different types of Walking Frame, Walker and their attachments. Para podium etc Developmental aids, fabrication of Box seat, Special Chair with or without table/tray, Standing/ tilting frame, Low-level cart, Prone board and various developmental and educational toys. Maximum use of Appropriate Technology while making developmental aids. Molded seats:, Measurement techniques of seats, Cast modifications, fabrication of molded seats with inside or outside posting, use of different materials and technologies to fabricate the same, suspension or right kinds of strapping. Wheelchair: Manual wheelchair: Benefits of appropriate wheelchair for a wheelchair user, Features and benefits of 'sitting upright' in wheelchair, Types of wheelchair, cushion and its components and its safe handling, pressure relief techniques, user assessment, measurement, fitting, Transfer techniques, Wheelchair mobility skills, customized wheelchair, Care & Maintenance of Wheelchairs and importance of wheelchair user instructions.

**PAPER XII**  
**MODULE ON EMPLOYABILITY SKILLS**

**Teaching Hours: 60**

**Credits: 02**

[www.employabilityskills.net](http://www.employabilityskills.net)

# UPPER EXTREMITY PROSTHETICS

## (PRACTICAL)

**Teaching Hours: 300**

**Credits: 10**

**Course Description:** This should include the supervised manufacture and fitting of all common devices and at least exposure to the range of devices not routinely seen in clinical practice.

The student should be able to meet the following learning objectives:

- Construct the device using appropriate fabrication techniques in preparation for the initial fitting.
- Fit the device to the patient using static and dynamic functional criteria established from the original assessment.
- Identify problems related to device fit and/or alignment and be able to suggest and implement appropriate correction.
- Communicate effectively with patient, co-workers, and other health care professionals in such a manner that will ensure the highest quality of service and reflect a professional attitude on the part of the student.
- Educate the patient / client and/or caregiver on use, care and function of the device.
- Understand the methodology of problem identification, problem solving in a process that includes all stake holders, with the client at the centre.

Prosthetics Practical:

Fabrication of prosthesis for partial hand amputation or congenital absence, through wrist prosthesis, Below Elbow prosthesis, Above Elbow prosthesis, Shoulder Disarticulation prosthesis, Elbow Disarticulation prosthesis.

## **SPINE AND UPPER EXTREMITY ORTHOTICS (PRACTICAL)**

**Teaching Hours: 330**

**Credits: 11**

**Course Description:** This should include the supervised manufacture and fitting of all common devices and at least exposure to the range of devices not routinely seen in clinical practice.

The student should be able to meet the following learning objectives:

- Construct the device using appropriate fabrication techniques in preparation for the initial fitting.
- Fit the device to the patient using static and dynamic functional criteria established from the original assessment.
- Identify problems related to device fit and/or alignment and be able to suggest and implement appropriate correction.
- Communicate effectively with patient, co-workers, and other health care professionals in such a manner that will ensure the highest quality of service and reflect a professional attitude on the part of the student.
- Educate the patient / client and/or caregiver on use, care and function of the device.

Understand the methodology of problem identification, problem solving in a process that includes all stake holders, with the client at the centre.

Prosthetics Practical: Fabrication of VARIOUS types of splints belonging to each group on model

## List of Books in Prosthetics & Orthotic

### I. Lower Extremity Prosthetics

S.No.	Title	Author / Publisher
1.	Lower Extremity Prosthetics (1973)	New York University
2.	The immediate post – operative Prosthesis in L.E. Amputation	Andrew C. Ruoff & Others.
3.	Contribution of L.E. Prosthetics Programme	Edmund M.
4.	Aircushion Socket for Petellar-Tendon Bearing B.K. Prosthesis	L.A. Willson, E. Iyquist and C. Radcliffe.
5.	B.K. Soft socket plastic leg	
6.	Fitting alignment & fabrication of a B.K. Prosthesis	L.F. Iulicucci
7.	Direct Forming of B.K., P.T. B. Socket with tools & materials.	Antony Stros & H.R. Gardner
8.	Bio-mechanics of B.K. Prosthesis	New York University PG Medical Schools
9.	Education programme on fluid	William M. Bennstock
Controlling Mechanism for AK Prosthesis		
10.	The swing phase of Walking with A.K. Prosthesis	V.A. Prosthetic Centre
11.	A.K. Prosthetic: Impression duplication of the Socket	E.F. Murphy (BPR Spring 1964)
12.	A New German Method of aligning A.K. Prosthesis	A.P. Gruman
13.	Adjustable Brim Fitting of above knee (AK) Amputees	J.Froot
14.	A flexible casting Brim Technique for A.K. Socket	Sidney Fishman & others
15.	Elements of training with much SNS – System A.K. Amputees	E.A. Lewis
16.	Use of temporary Prosthesis & Adjustable walking Jig.	C.F. Mealler
17.	A.K. Prosthesis Socket Shape related to Anatomy of Hip & Thigh	University of California

18.	Functional Consideration in the Fitting of A.K. Prosthesis	C.W. Radcliffe
19.	Above Knee Amputation – Prosthetic Principles & Practice	Zame Grim
20.	Self Energised Power System for A.K. Prosthesis	R. Seliktaw
21.	Problems in the fitting & Services of Prosthetic devices for A.K. Amputees	Arun Setm
22.	B.K. & A.K. Prosthesis	National Academy of Science
<b>II. Upper Extremity Prosthetics</b>		
1.	Upper Extremity Prosthetics	Veteran Adma. N.Y.
2.	Upper Extremity Prosthetics.	North Western University Medical Sector – I
3.	Upper Extremity Prosthetic for Prosthetists	-do
4.	Manipulator & U.E. Prosthetics	National Academy of Science
5.	The use of Low fiction Housing Liner in U.E. Prosthesis	F. Sammons
6.	Cine Plastic Above- Elbow Prosthesis	Thomas J. Canty
7.	Manual of Upper Extremity Prosthetics	Willam R. Santshi Edn.
8.	How to fit Robin Aids partial hand Prosthesis	Miles H. Anderson.
9.	Evaluation of the Heidelberg Pneumatic prosthesis	Luigi Lucaccini & Other
10.	Clinical Evaluation of External Powered Upper Limb Prosthesis	Carol A. Ross.
<b>III. General Prosthesis</b>		
1.	Materials & Tools for Prosthesis	
2.	Maintenance & Care of the Prosthesis	C. A. Hannesseg.
3.	Principles in Prosthetic Management for Multiple Handicapped	E.F. Murphy
4.	April Hook Training Lessons	Sicra Engineering
5.	A Hemipel tectomy Prosthesis	Fred Hampton

6.	The Limb Deficient Child	Berton Blake
7.	Report of the U.N. Inter –regional seminar on Training Prosthetists	United Nations
8.	Limb Prosthetics – 72	A. Benittoo Wilson
9.	Prosthetics	World Veteran Federat
10.	Muscles Skeletal System	E.F. Murphy
11.	Deigning to Meet the Challenges in Prosthetics	E.F. Murphy
12.	Hip Disarticulation Prosthesis	C.A. Melaucik
13.	The Canadian type of Hip Disarticulation Prosthesis	J.Froot
14.	Casting Hemipelctomy & Hip Disarticulation Prosthesis	V.A. Prosthetic Centre
15.	Evaluation of Total Hip Replacement	D.A. Mc. Grouther.

#### **IV. Lower Extremity Orthotics**

1.	Lower Limb Orthotics Conventional	University of Strathclyde.
2.	Use of External support in the treatment of LowBack Pain.	
3.	Selected Lower Limb Anomalico	Goorgo T. Aitken
4.	Workshop Panel on L.E. Orthotics	R.D. Keagy & Orther
5.	Powered Lower Limb Orthotics in Paraplegia	J. Hughoo

#### **V- Upper Extremity Orthotics**

1.	Development of Externally powered Upper Extremity orthotics	Bayior University
2.	The strength of hand	A.B. Samson & Orther
3.	Clinical Evaluation of the Engen	Hecter M.Kag
4.	Hand Splint	
5.	Development of U.E. Orthotics	T.J Engen
6.	Lumbo–sacral support	

#### **VI -Miscellaneous Orthotics**



1.	Spinal Orthotics	Rehabilitation Services Administration
2.	Materials & Tools for Orthotics	American Orthotic & Prosthetic Association
3.	Orthotic Services USA	AO & PA
4.	Orthopedic Appliances Atlas	AAOS
5.	The Red Book of Anatomical Support	AAOS
6.	Principles of fracture fixation	Charles O. Bechtul
7.	Orthopedic Corset & Bolts	Veteran Administration
8.	Congenital Limb Deficiency	Charles A. Frank
9.	Orthotic Research & Development	By R.O. Rattily, National Academy of Science
10.	Orthotic Systems & Research	R.N. Scott
11.	The Advance in Orthotics	George Murdon, ED.
12.	Atlas of Orthotics: Bio-Mechanical Principles & Application	Anerical Academy of Ortho. Surgeons.
13.	Orthotic Etcetera	John. E. Redford University
14.	Course on Orthotics	North Western University Medical School
15.	Orthotic Prescription	W.H. Handerson.

The following are important publications on Prosthetic and Orthotic and enquires may kindly be made to them to get the latest catalogues for procurement of books.

1. American Academy of Orthotists & Prosthetists, 717, Pendleton Street, Alexandria – VA 22314.
2. American Orthotic & Prosthetic Association, 717, Pendleton, Street, Alexandria- VA22314.
3. The Superintendent of Document, US Govt. Printing office, Washington, DC 20402USA.th
4. Prosthetic & Orthotics, New York University P.G. Medical School 317, East 34 Street, New York 10016.
5. National Academy of Science, 2101 Construction Avenue, Washington, DC 20418.

**Important Journals dealing in Prosthetics and Orthotics.**

<b>S. No.</b>	<b>Title</b>	<b>Editor &amp; Publisher</b>
1.	Journal of Prosthetic and Orthotic International	International Society for Prosthetics and Orthotics. Secretariat: ISPO, Borgervaenge – 5, 2100 Copenhagen, Denmark
2.	Clinical Prosthetics and Orthotics	American Academy of Orthotists & Prosthetists, 717 Pendleton Street, Alexandria VA-22314.
3.	Orthotic and Prosthetics	American Orthotic & Prosthetic Association, 717, Pendleton Street Alexandria, Virginia- 22314
4.	The Journal of Rehabilitation in Asia	Editor, W.G. Rama Rao , Hon. Treasurer, ISRH, C/o P.C. Hansotic & Co. 51, M.G. Road, Bombay-400 023
5.	Archives of Physical Medicine and Rehabilitation	Circulation Manger, Archives of Physical Medical & Rehabilitation, 30 N. Michigan Avenue, Secte-992 CHICAGO- Illinois – 60602.

Suggestive Reading (Indian Authors)

List of Reference books in Hindi/Indian Authors for DPO

<b>Sr.No</b>	<b>Title</b>	<b>Author</b>
1	3D printing in Prosthetics and Orthotics- Innovations and Opportunities	Dr. Salman Shaikh
2	Prosthetics and Orthotics in Rehabilitation Management	Sh. Tarik Kumar Datta
3	Prosthetics Concepts Question Based Learning Approach	Sh. Rishabh Gupta and Ms. Yamini Khanna
4	Short Test Book of Prosthetics and Orthotics	Sh. R. Chinnathurai
5	Essentials of Prosthetics and Orthotics	Sh. A.K. Agarwal