

**Certificate Course in Prosthetics & Orthotics
(CPO)**

Syllabus

Norms, Regulations & Course Content



REHABILITATION COUNCIL OF INDIA

(Statutory Body Under Ministry of Social Justice & Empowerment)

B-22, Qutab Institutional Area

New Delhi – 110 016

2014

www.rehabcouncil.nic.in

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1. Nomenclature of the Course :

Certificate Course in Prosthetics & Orthotics

2. Purpose

To train category III personnel (bench workers) for assembly and fitting of Orthopaedic appliances, artificial limbs and other rehabilitation aids under supervision of Prosthetist & Orthotist (Category I professional).

3. Entry Requirement

Certificate from I.T.I. in any of the trades of fitter/carpenter/leather.

Or

10th class pass and two years of practical experience in a recognized P&O Centre under a P&O Professional.

4. Faculty

(a) Teachers-student ratio of 1:6 is to be maintained.

(b) Core Faculty: i) One Qualified Rehabilitation Professional in Prosthetics & Orthotics having Diploma in Prosthetics & Orthotics and 5years of experience in Prosthetics & Orthotics workshop **or** 3 years of experience after having Degree in Prosthetics & Orthotics.

ii) One Instructor: Diploma in Prosthetics & Orthotics with 3years of experience or Degree in Prosthetics & Orthotics.

(c) Guest Lecturer: Two

5. Laboratory

(a) It should be a limb fitting centre with minimum turnout of 30 cases per month of different kinds, excluding camps.

(b) List of Prosthetics & Orthotics Equipments:

S.N.	Equipment	Quantity	S.N.	Equipment	Quantity
1	Wood workers vice	1	40	Tabsets 1/8, 5/32,3/16,1/4,7/64 B.S.W. with wrenches	1 each
2	Pipe vice	1	41	Die set 1/8,5/32,3/16,7/64 B.S.W.with wrenches	1 each
3	Engineers surface plate	1	42	Wire files	1each
4	Carpenters augur	1	43	File 12" Flat	1
5	Chisels (various sizes)	1 each	44	Half round 12" rough	1
6	Carpenters tools set	1 each	45	12" Flat smooth	1
7	Fitters tools set	1 each	46	12" half round smooth	1
8	Fitters tools set	1	47	6" flat rough	1
9	Calipers, dividers & compasses	1	48	6" half round and smooth	1
10	Gauges	6	49	10" round rough and smooth	1
11	Allen Key set	1	50	10" Knife wedge rough	1
12	Measurement table	1	51	10" Square rough	1
13	Screw Drivers	1	52	8" rough marfa file	1
14	Nut replacement tool	7 mm 1	53	8" second cut marfa file	1
15	Nut replacement tool	9 mm 1	54	8" rough round marfa file	1

16	Cold Chisel	1 set	55	14" all flat file	1
17	Plastic mallet	2	56	Tray square 150 mm	1
18	Diagonal Cutter	1	57	Wood marking gauge	1
19	Grip vice pliers	1	58	Rif saw 70 mm 3 points	1
20	Plastic cutting saw	1	59	Cross cut saw 600 mm with 10 teeth/25 mm	1
21	Band saw machine	1	60	Panel saw 500 mm with 10 teeth/25 mm	1
22	Soldering Iron	1	61	Tenon saw 250 mm with 13 teeth/24 mm	1
23	Hammers for leather work	4	62	Chisels	1
24	Pincers 6" Indian	2	63	Firmer flat	1
25	Punch to break eyelet	2	64	Bevelled edge	1
26	Rampi straight type	4	65	Paring chisel	1
27	Shoe makers anvil	2	66	Mortise chisel	1
28	Shoe awl	2	67	Planes	1
29	Scissors 9" for leather work	2	68	Jack Plane (metal blade 350 mm with Blade 100 mm)	1
30	Top cutter 6" Indian super	1	69	Spoke share	1
31	Top cutter 8" Indian super	1	70	Machines	1
32	Metal cutting scissor 14"	1	71	Bench drilling machine	1
33	Electric Iron (Press)	1	72	Bolt & Disc sander	1
34	Number punch 0 to 9 ¼"	1	73	Hand shearing machine	1
35	Spanner fix 1/8 to ½"	1	74	Grinder wolf model T.G.6	1
36	Vice No. 32	1	75	Leather sawing machine motorised	1
37	Vice No. 40	1	76	Electric Oven 90x90x90 mm	1
38	Round nose 1	1	77	Flat nose	1
39	Half round nose	1			

6. Duration of the Course

The duration of the course will be one year.

7. MINIMUM FOR PASS AND CLASSIFICATION OF SUCCESSFUL CANDIDATES 40% each in theory and practical

8. EXAMINATION REGULATIONS: As per Scheme of Examinations of RCI.

SCHEME OF CURRICULUM FOR CERTIFICATE COURSE IN PROSTHETIC & ORTHOTIC (CPO)

Internal Assessment and Final Examination

Paper	Subject	IA Marks	EA Marks	Total	Exam Duration
Theory					
I	Basic Clinical Science (a. Anatomy b. Physiology c. Physical Medicine and Rehabilitation and d. Surgery/Orthopedics)	30	45	75	2Hrs
II	Workshop Practice, Machines and Tools Material	30	45	75	2Hrs
III	Orthotics (Lower, Upper & Spinal)	40	60	100	3Hrs
IV	Prosthetics (Upper & Lower)	40	60	100	3Hrs
				350	
Practical					
V	Orthotics lower extremity, upper extremity & spinal orthotics	100	50	150	
VI	Prosthetics- lower extremity, upper extremity	100	50	150	
				300	

Note: Internal Assessment marks based on performance of individual student throughout the academic year. External Examination marks of theory exam conducted at the end of the year.

Theory and Practical Hours

Paper	Subject	Hrs	
		Theory	Practical
I	Basic Clinical Science: a. Anatomy b. Physiology c. Physical Medicine and Rehabilitation and d. Surgery/Orthopedics	15 10 10 10	-- 75
II	Workshop Practice, Machines and Tools Material	45	75
III	Orthotics : Lower, Upper & Spinal	45 30 45	175 120 150
IV	Prosthetics : Upper & Lower Mobility Aids & Other Appliances	30 45 45	120 150 100
		330	965
TOTAL		1295	
Practical			
V	Orthotics lower extremity, upper extremity & spinal orthotics		
VI	Prosthetics- lower extremity, upper extremity		

*Final viva for Orthotics lower extremity, upper extremity & spinal orthotics and Prosthetics- lower extremity, upper extremity will be conducted by the External and Internal Examiners together. Annual work to be evaluated by the Institutes internally.

Paper I- Basic Clinical Science (a. Anatomy b. Physiology c. Physical Medicine and Rehabilitation and d. Surgery/Orthopedics)

(1) Anatomy:

- * Introduction to anatomy, surface anatomy, muscular system {different types of muscles and attachment, nerve and blood supply, action (lower extremity) some for Upper Extremity trunk and Abdomen and spine),
- * Skeletal system and
- * Basic biomechanics

(2) Physiology (Basic)

- * Introduction to physiology, circulatory system, cardiac system – heart and its function – blood pressure – pulse, control of heat.
- * Respiratory system & structure of lungs – mechanism of respiration
- * Urinary system, Mechanism of micturition
- * Digestive system, Mechanism of Defecation
- * Nervous system – Chief tracts – reflex action – Postural Reflex –Peripheral Nervous system.

(3) Surgery & Orthopaedics

- * Introduction to Surgery & Orthopaedics, various levels of Amputation, both Upper Extremity & Lower Extremity
- *Examination of stump skin condition, sensation, contractures deformities,etc.
- *Congenital and acquired deformities
- *Disease of Nervous system – Poliomyelitis Obstetrical paralysis – spastic paralysis –Hemiplegia – Paraplegia – Pyogenic Infection – Leprosy –
- *Chronic Arthritis – Neuropathic Arthritis – Metabolic Disease – Rickets –Avitaminosis
- *Disorders: Paralysis pain and deformities of spine foot and Upper Extremity.

(4) Physical Medicine & Rehabilitation

- * Introduction to Physical Medicine & Rehabilitation
- * Basic knowledge of Physical therapy/Occupational Therapy
- * Basic understanding of Human locomotion & Gait
- * CBR Concept in Rehabilitation, Govt. Schemes for rehabilitation and concretion to handicapped.

References:

Paper-II Workshop Practice, Machines and Tools Material

- * Knowledge of operating and maintenance of different machines required in Limb Fitting Centres, such as Sewing machines, Ortho-vac, Grinders, Drill Machines, etc.
- * Hand tools like screw drivers, files, clamps, etc.
- * Special purpose tools
- * Material used in Orthotics & Prosthetics such as Plastics, wood, aluminum, iron, rubber, foam, leather, etc.
- * Workshop safety and first aid
- * Handling and transportation of patients, persons with disabilities.

References:

Paper-III Orthotics (Lower, Upper & Spinal)

a. Orthotics Lower

- * Orthotics Lower Extremity, Deformities, disorders and pains in lower extremity.
- * Nomenclature and knowledge of different type of orthosis their purpose of giving and check-up
- * Measurement – Casting – impressions
- * Selection of components, assembly, alignment, check-up of different type of orthosis

b. Orthotics Upper

- * Orthotics Upper Extremity
- * Deformities, disorders and pains in upper extremity.
- * Nomenclature and knowledge of different type of orthosis their purpose of giving and check-up
- * Measurement – Casting – impressions –
- * Selection of components, assembly, alignment, check-up of different type of orthosis

c. Spinal Orthotics

- * Spinal Orthotics
- * Deformities, disorders and pains
- * Nomenclature and knowledge of different type of orthosis their purpose of giving and check-up
- * Measurement – Casting – impressions –
- * Selection of components, assembly, alignment, check-up of different type of orthosis

References:

Paper-IV- Prosthetics (Upper & Lower)

a. Prosthetics Upper

- * Prosthetics Upper
- * Measurement – Casting – impressions
- * Nomenclature and knowledge of different type of prosthesis their purpose of giving and check-up
- * Selection of components, assembly, alignment, check-up of different type of Prosthesis

b. Prosthetics Lower

- * Prosthetics Lower
- * Measurement – Casting – impressions –
- * Nomenclature and knowledge of different type of prosthesis their purpose of giving and check-up
- * Selection of components, assembly, alignment, check-up of different type of Prosthesis

c. Mobility Aids & Other Appliances

- * Wheel Chairs & Tricycle: Types, design, strength and special purpose wheel chair/Tricycle dimensions.
- * Crutches, Canes and Sticks: Measurements, Strength, types etc.
- * Walkers/other mobility aids: Measurements types, design, strength

References:

C. Visit

To visit atleast one of the well established rehabilitation centres in the country, other than the place of work.

Note :

1. Precis will be provided for each lecture.
2. Practical work (Orthotics) : Each student will be given on the job training and will have to bend, assemble and fit 2 B.K. Orthosis, 2 A.K. Orthosis, and various types of splints (Bracing of feet deformities – shoe modifications, fabrication of shoes below knee Orthosis – Above knee Orthosis, knee cage, Bilateral Orthosis – Orthosis of upper limbs, Orthosis spinal).
3. Practical Work (Prosthetics):
 - (a) Prosthetics: Each student will be given on the job training in the fabrication of socket, assembly, alignment and fitting on patients.
 - (b) Lower Limb Prosthetics: Each student will be required to independently take cast of stump, modify cast, fabrication of socket, shaping of socket, assembly of components, static and dynamic alignment and gait analysis. At least two B.K. prosthesis and one A.K. prosthesis is to be fitted.
 - (c) Upper Limb Prosthesis: At least two upper limb prosthesis are to be fitted after taking cast of stump, modification, fabrication of socket and assembly of all components with harness and control.