



DHANALAKSHMI SRINIVASAN
INSTITUTE OF TECHNOLOGY
(Approved by AICTE, New Delhi & Affiliated to Anna University)
NH - 45, Trichy - Chennai Trunk Road,
SAMAYAPURAM, TRICHY - 621 112.
E.mail: dsit2011@gmail.com Website: www.dsit.ac.in

COURSE PLAN

Subject code: BM6801	Branch/Year/Sem/Section: B.E BME/VIII/IV
Subject Name: REHABILITATION ENGINEERING	Batch: 2016-2020
Staff Name: B.MUTHAMIL	Academic year: 2019-2020

COURSE OBJECTIVE

1. To Study the principles of rehabilitation
2. To Know new rehabilitation concepts for future development and applications.
3. To Learn therapeutic Exercise Techniques.
4. To Understand orthopedic prosthetics and orthotics in rehabilitation.

TEXT BOOK:

T1. Dr. S. Sunder, Rehabilitation Medicine-, 3rd Edition, Jaypee Medical Publications, New Delhi. 2010 (Units I, III, IV & V)

T2. Joseph D. Bronzino, The Biomedical Engineering Handbook, Third Edition: Three Volume Set, CRC Press, 2006 (Units II & V).

REFERENCES:

R1. Rory A Cooper, An Introduction to Rehabilitation Engineering, Taylor & Francis, CRC press, 2006.

R2. Susan B O'Sullivan, Thomas J Schmitz, Physical Rehabilitation. 5th Edition, Davis publications, 2007.

WEB RESOURCES

W1: <https://www.intechopen.com/books/clinical-physical-therapy/exercise-therapy-for-physical-therapist>
(TOPIC NO: 20)

W2: <https://www.sciencedirect.com/topics/nursing-and-health-professions/knee-ankle-foot-orthosis>
(TOPIC NO: 40, 41)

TEACHING METHODOLOGIES:

- BB - BLACK BOARD
- VIDEO - VIDEO TUTORIAL
- PPT - POWER POINT PRESENTATION



DHANALAKSHMI SRINIVASAN
INSTITUTE OF TECHNOLOGY
(Approved by AICTE, New Delhi & Affiliated to Anna University)
NH - 45, Trichy - Chennai Trunk Road,
SAMAYAPURAM, TRICHY - 621 112.
E.mail: dsit2011@gmail.com Website: www.dsit.ac.in

DEPARTMENT OF BIOMEDICAL ENGINEERING

BM6801

REHABILITATION ENGINEERING

L T P C
3 0 0 3
9

UNIT I INTRODUCTION TO REHABILITATION & REHABILITATION TEAM:

What is Rehabilitation, Epidemiology of Rehabilitation, Health, Levels of Prevention, Preventive Rehabilitation, Diagnosis of Disability, Functional Diagnosis, Importance of Psychiatry in Functional diagnosis, Impairment disability handicap, Primary & secondary Disabilities, Rehabilitation team- Classification of members, The Role of Psychiatrist, Occupational therapist, Physical therapist, Recreation therapist, Prosthetist - Orthotist, Speech pathologist, Rehabilitation nurse, Social worker, Corrective therapist, Psychologist, Music therapist, Dance therapist & Biomedical engineer.

UNIT II PRINCIPLES OF REHABILITATION:

Introduction, The Human Component, Principles of Assistive Technology Assessment, Principles of Rehabilitation Engineering- Key Engineering Principles, Key Ergonomic Principles - Practice of Rehabilitation and Assistive Technology.

UNIT III THERAPEUTIC EXERCISE TECHNIQUE:

Co-ordination exercises, Frenkels exercises, Gait analyses-Pathological Gaits, Gait Training, Relaxation exercises-Methods for training Relaxation, Strengthening exercises-Strength training, Types of Contraction, Mobilisation exercises, Endurance exercises.

UNIT IV PRINCIPLES IN MANAGEMENT OF COMMUNICATION:

Impairment-introduction to communication, Aphasia, Types of aphasia, Treatment of aphasic patient, Augmentative communication-general form of communication, types of visual aids, Hearing aids, Types of conventional hearing aid, Writing aids.

UNIT V ORTHOTIC & PROSTHETIC DEVICES:

General orthotics, Classification of orthotics-functional & regional, General principles of Orthosis, Calipers- FO, AFO, KAFO, HKAFO.

Prosthetic devices: Hand and arm replacement, Body powered prosthetics, Myoelectric controlled prosthetics and Externally powered limb prosthetics.

TOTAL: 45 PERIODS

Topic No	Topic Name	Books For reference	Page No	Teaching Methodology	No of periods required	Cumulative periods
UNIT I INTRODUCTION TO REHABILITATION & REHABILITATION TEAM (9)						
1.	Epidemiology of Rehabilitation	T1	5	BB	1	1
2.	Health, Levels of Prevention, Preventive Rehabilitation	T1	6	BB	1	2
3.	Diagnosis of Disability, Functional Diagnosis, Importance of Psychiatry in Functional Diagnosis	T1	11	BB	1	3
4.	Impairment disability handicap, Primary & secondary Disabilities	T1	8	BB	1	4
5.	Rehabilitation team- Classification of members	T1	16	BB	1	5
6.	The Role of Psychiatrist, Occupational therapist, Physical therapist, Recreation therapist, Prosthetist	T1	17	BB	1	6
7.	Orthotist, Speech pathologist, Rehabilitation nurse,	T1	22	BB	1	7
8.	Social worker, Corrective therapist, Psychologist,	T1	26	BB	1	8
9.	Music therapist, Dance therapist & Biomedical engineer.	T1	23	BB	1	9
LEARNING OUTCOME: At the end of unit , the students will be able to <ul style="list-style-type: none"> • Know the fundamentals of Health, Levels of Prevention. • Understand the Rehabilitation team. • Understand the Role of Rehabilitation team members . 						
UNIT II PRINCIPLES OF REHABILITATION (9)						
10.	Introduction	T1	412	BB	1	10
11.	The human component	T1	415	BB	1	11

12.	Principles of Assistive Technology	T1	426	BB	1	12
13.	Principles of Assessment	T1	442	BB	1	13
14.	Principles of Rehabilitation Engineering	T1	386	BB	1	14
15.	Key engineering principles	T1	390	BB	1	15
16.	Key ergonomic principles	T1	-	BB	1	16
17.	Practice of Rehabilitation Engineering	T1	408	BB	1	17
18.	Practice of Assistive Technology	T1	-	BB	1	18

LEARNING OUTCOME:

At the end of unit , the students will be able to

- Understand the concept of Assistive Technology.
- Define Key Engineering Principles.

Gain the knowledge about Practice of Assistive Technology

UNIT - III THERAPEUTIC EXERCISE TECHNIQUE (9)

19.	Co-ordination exercises	T1	33	BB	1	19
20.	Frenkels exercises	T1	36	BB & VIDEO	1	20
21.	Gait analyses	T1	38	BB	1	21
22.	Pathological gaits	T1	42	BB	1	22
23.	Gait training	T1	46	BB	1	23
24.	Strength training	T1	59	BB	1	24
25.	Types of Contraction,	T1	51	BB	1	25
26.	Mobilisation exercises,	T1	65	BB	1	26
27.	Endurance exercises.	T1	68	BB	1	27

LEARNING OUTCOME:

At the end of unit , the students will be able to

- Understand the concept of exercises
- Gain knowledge about Methods and training for Relaxation and Strengthening.
- Define Types of Contraction.

UNIT IV PRINCIPLES IN MANAGEMENT OF COMMUNICATION (9)						
28.	Impairment	T1	5,90	BB	1	28
29.	Introduction to communication	T1	83	BB & VIDEO	1	29
30.	Aphasia, Types of aphasia,	T1	86	BB	1	30
31.	Treatment of aphasic patient	T1	88	BB	1	31
32.	Augmentative communication-general form of communication	T1	90	BB	1	32
33.	Types of visual aids	T1	99	BB	1	33
34.	Types of Hearing aids	T1	92	BB	1	34
35.	Types of conventional hearing aid	T1	94	BB	1	35
36.	Types of conventional Writing aids	T1	98	BB	1	36
LEARNING OUTCOME: At the end of unit , the students will be able to <ul style="list-style-type: none"> • Understand the concept of conventional aids. • Known about impairment. • Get the knowledge about Aphasia. 						
UNIT V ORTHOTIC & PROSTHETIC DEVICES (9)						
37.	General orthotics	T1	122	BB	1	37
38.	Classification of orthotics functional & regional	T1	125	BB	1	38
39.	General principles of Orthosis Scheduling	T1	123	BB	1	39
40.	Calipers- FO, AFO	T1	129	BB	1	40
41.	KAFO, HKAFO	T1	136,138	BB	1	41
42.	Prosthetic devices	T1	156	BB	1	42
43.	Hand and arm replacement	W1	159	PPT	1	43

44.	Body powered prosthetics	W2	175	PPT	1	44
45.	Myoelectric controlled Prosthetics and Externally powered limb prosthetics.	W3	192	PPT	1	45

LEARNING OUTCOME:

At the end of unit , the students will be able to Know new rehabilitation concepts

COURSE OUTCOME

At the end of the course, the student should be able to:

- Explain the needs of rehabilitations and its future development
- Describe therapeutic exercise techniques, Orthopedic Prosthetics, Orthotics

CONTENT BEYOND THE SYLLABUS

EXERCISE AND PROSTHETIC DEVICES

CONTINUES INTERNAL ASSESSMENT DETAIL

ASSESMENT NUMBER	I	II	MODEL
TOPIC NO.(UNIT)	1-18 (1 st & 2 nd units)	19-36 (3 rd & 4 th units)	1-45 (units 1-5)

ASSIGNMENT DETAILS

ASSIGNMENT NUMBER	I	II	III
TOPIC NUMBER FOR REFERENCE	1-18 (1 st & 2 nd units)	19-36 (3 rd & 4 th units)	1-45 (units 1-5)
DEAD LINE			

ASSIGNMENT NUMBER	BATCH	DESCRIPTIVE QUESTIONS/TOPIC (Minimum of 8 Pages)
I	B1	Explain Epidemiology of Rehabilitation
	B2	Describe Rehabilitation team
	B3	Explain Role of Psychiatrist, Occupational therapist
II	B1	Types of visual aids
	B2	Types of conventional hearing aid
	B3	Aphasia, Types of aphasia
III	B1	FO, AFO
	B2	KAFO, HKAFO
	B3	Body powered prosthetics