

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

BIOMEDICAL ENGINEERING

Subject Name: **REHABILITATION ENGINEERING (RE)**

Sr. No.	Course Contents	Total Hrs
1.	INTRODUCTION TO REHABILITATION: Meaning & types of physical, Impairment, Engineering concept in sensory & motor rehabilitation.	06
2.	ORTHOTICS & ORTHOPROSTHETICS: Intelligent prosthetic knee, Prosthetic hand, Advance and automated prosthetics and orthotics, Externally powered and controlled orthotics and prosthetics-FES system, Restoration of Hand function, Restoration of standing and walking, Hybrid assistive system(HAS). Myoelectric Hand and Arm prosthesis, Intelligent Hand Prosthesis (MARCUS).	08
3.	Electronic Travel Applications (ETA) : Path Sounder, Laser Cane, Ultrasonic Torch, Sonic Guide, Light Probes, Nottingham Obstacle Sensor, Electro-cortical Prosthesis, Electro Roftalam. Polarized Ultrasonic Travel Aid. Types of wheel chair, Design of wheelchair, Ergonomic considerations in design of wheelchair, Powered wheelchair, Tricycle, Walkers, Crutches.	08
4.	SENSORY AUGMENTATION & SUBSTITUTION: Classification of visual impairment, prevention and cure of visual impairment, Visual augmentation, Tactual vision substitution, auditory substitution and augmentation, Tactual auditory substitution, Assistive devices for the visually impaired.	09
5.	MEASUREMENT TOOLS AND PROCESSES: Subjective and Objective measurement methods, Measurement and assessment, Measurement, objectives and approaches, characterizing human systems and sub-systems. Characterizing assistive.	09
6.	ADVANCE APPLICATIONS IN REHABILITATION ENGINEERING : Interfaces in compensation for visual perception, Improvement of orientation and Mobility. Rehabilitation aids for mentally impaired; Sleeping aids, Seating, walking & Postural aids., FES system design.	10

The Practical will be based on the topics covered in the syllabus.

Text Books:

1. Robinson, C., J., "Rehabilitation Engineering".
2. Ballabio, E., "Rehabilitation Technology".
3. Assistive technology-principle and practice- cook and hussy

Reference:

1. Kennedy, R., M., "Textbook of Biomedical Engineering".
2. Richard, S., & Chien, S., "Handbook of Biomedical Engineering".