SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A++ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

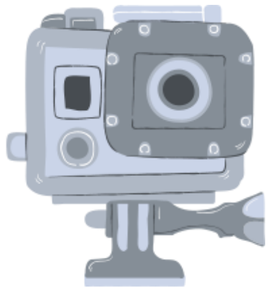
DEPARTMENT OF BIOMEDICAL ENGINEERING

COURSE NAME: 19BMT301/ BIOCONTROL SYSTEM

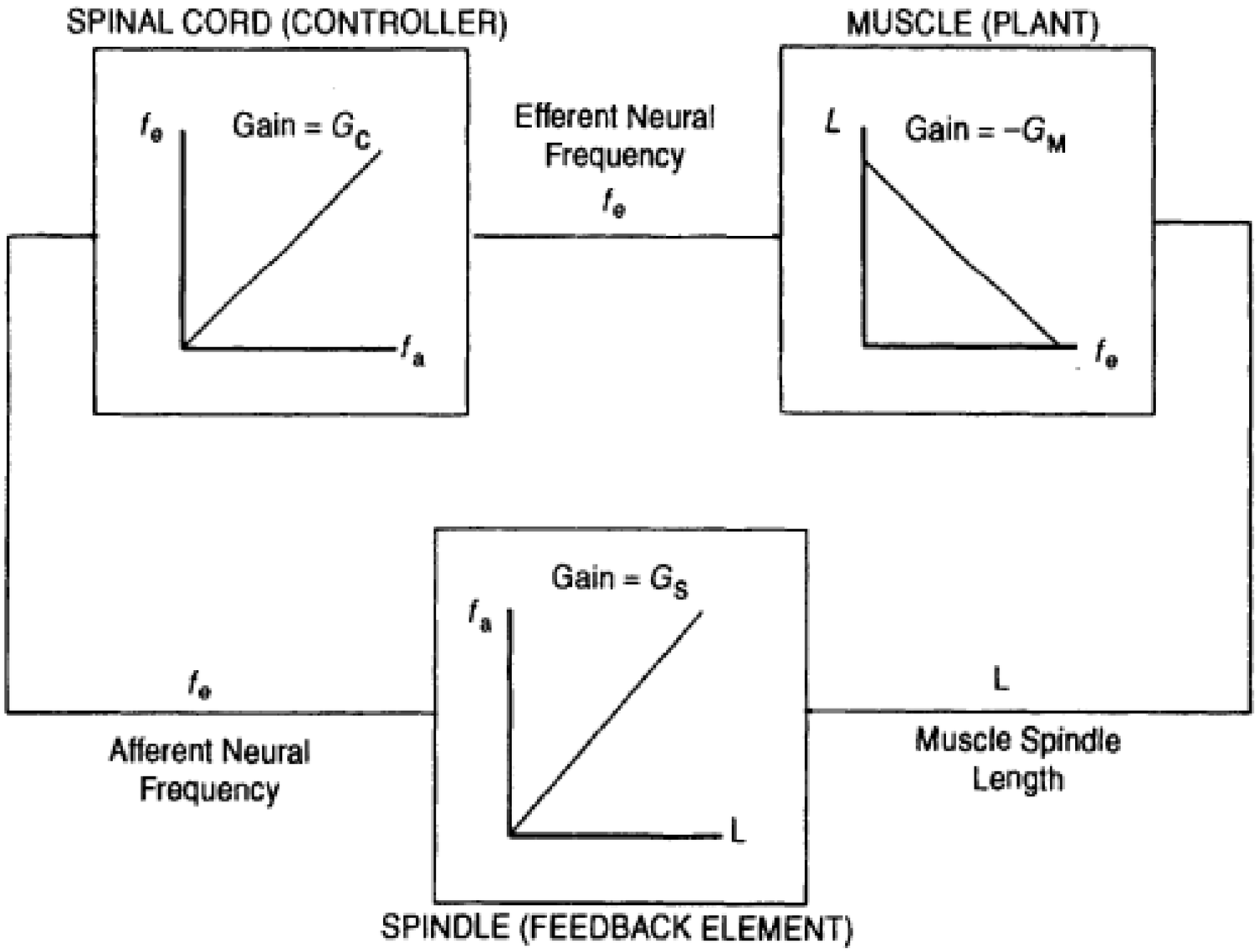
III YEAR / V SEMESTER

Unit 5 – Physiological Control System

Topic 2: Steady State Analysis of Muscle Stretch Reflex Action



Muscle stretch reflex



Muscle stretch reflex

•At the level of the spinal cord, afferent neural discharge frequency f_a, is converted into efferent discharge frequency f_e, through the linear relationship

$$f_e = G_C f_a$$

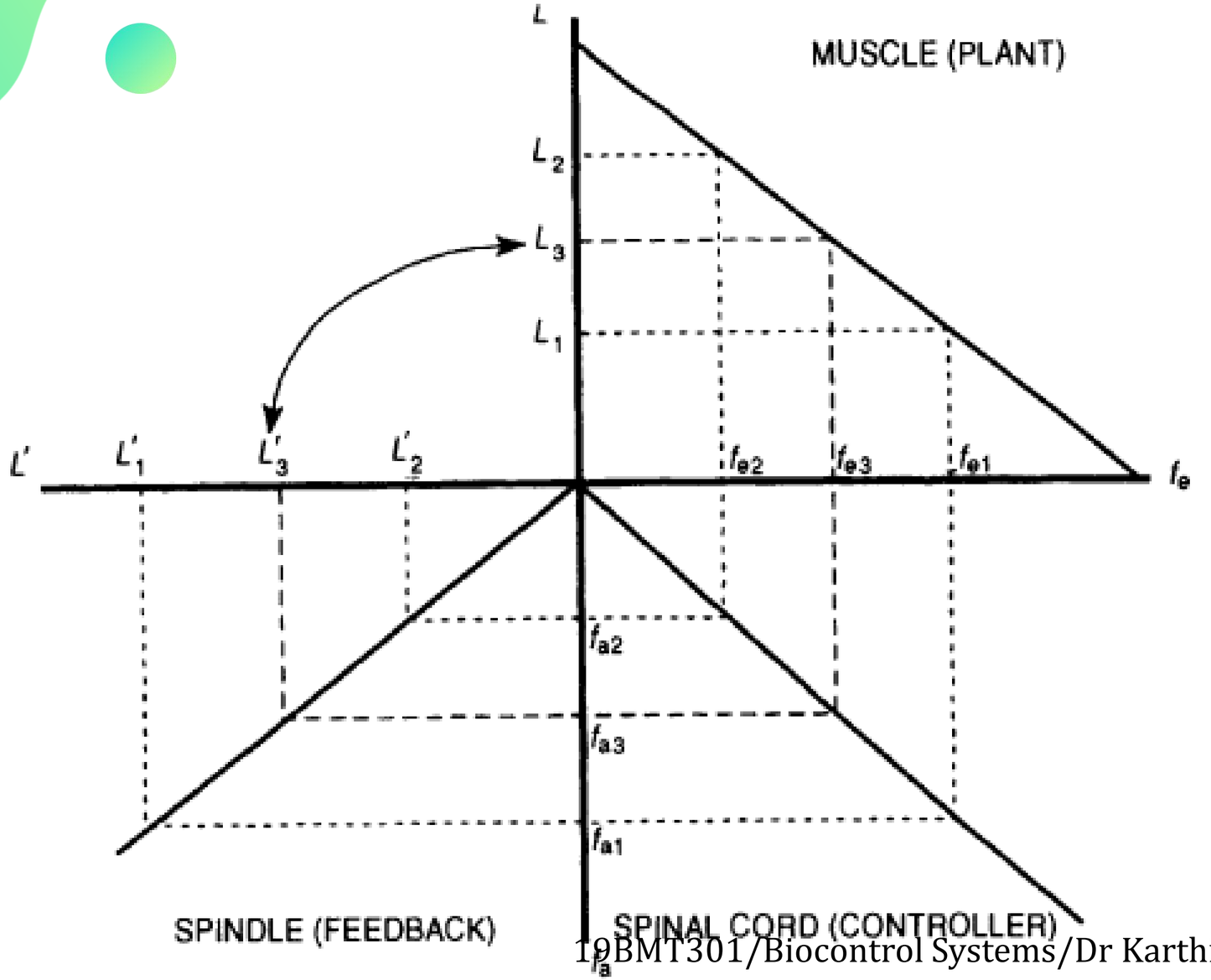
•Assuming the amount of contraction is proportional to the increase in efferent frequency, we have the following steady-state muscle characteristic:

$$L = L_0 - G_M f_e$$

•Finally, we assume that the muscle spindle sends afferent neural impulses back to the spinal cord in proportion to the length of the muscle, so that afferent traffic increases when the muscle is stretched:

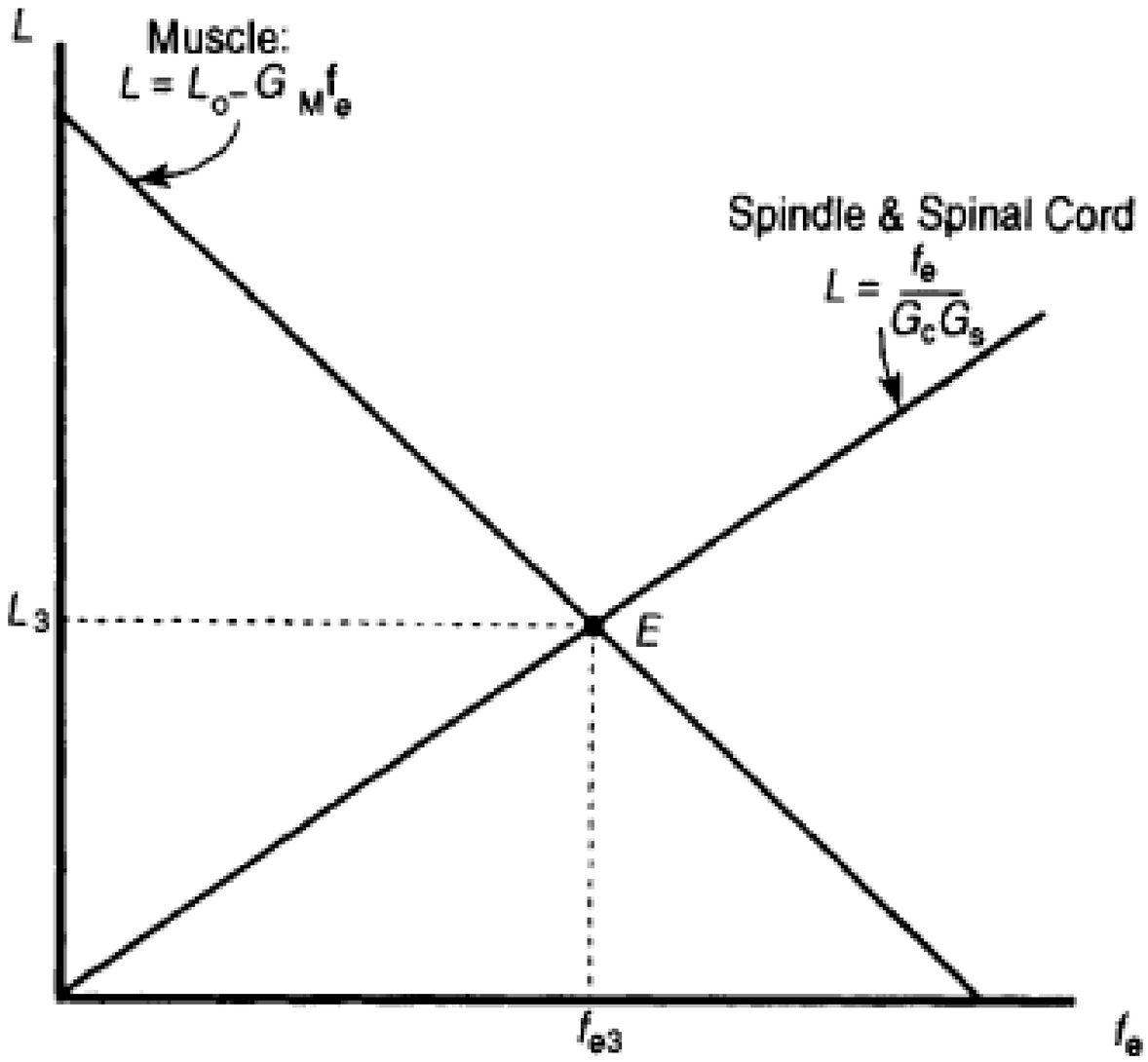
$$f_a = G_S L$$

Muscle stretch reflex



The spinal cord(f_e vs f_a) graph shares the same axis as the muscle (L vs f_e) graph and is rotated 90° clockwise, so the f_a axis points downward. The spindle (f_a vs. L) graph is rotated 180° clockwise and shares the same axis as the spinal cord.

Muscle stretch reflex



ASSESMENT

Dear student,

Quiz is posted in your Google class room

Allotted time for quiz is 5 min

No of Questions is 10

KEEP
LEARNING..

Thank u

SEE YOU IN NEXT CLASS