BIOMEDICAL DATA ACQUISITION AND ELECTRICAL SAFETY (4200)

Teaching Schedule Per week			Progressive Assessment	Examination Schedule (Marks)					
Lectures	Practical	Credits	Semester	Theory	Test	Total	TW	PR	Gr Total
-	4	4		—	—	—	50	50	100

Rationale: This subject takes the student through the process of acquiring data step by step, from the type of transducer to be used to manipulating the data obtained. Students may have studied certain aspects before, but the advantage of this subject is that a student can correlate the different stages of a data acquisition system and hence study the subject effectively.

COURSE CONTENTS

1.HOW DATA ACQUISITION SYSTEM WORKS
Introduction, Analog to digital converters, Multiplexing, Sample and hold circuit, digital to analog converter.

2.IMPORTANT CONCEPTS
Sampling rate, aliasing, preventing aliasing, finding maximum frequency of a signal

3.CONNECTING TO REAL WORLD WITH TRANSDUCERS
Study of different transducers:

a. Temperature transducer
b. Force transducer
c. Light transducer
d. Displacement and rotation.
e. Non-linear transducers

4.DATA MANIPULATION
Peak, Trough, Zero crossing detection, Filters, Spectral analysis & FFT, Integration, Differentiation, Correlation, Removing 50/60 interference.

PRACTICALS: The students will be introduced to the entire data acquisition system. They will also have some practical sessions on data manipulation.
MINI PROJECT: The students will have to design a data acquisition system. The student will then make a project report, which will be then checked by the teacher.
VISITS:
Visit to industries/hospitals having data acquisition system.
REFERENCE BOOKS:
1.Biomedical Digital Signal Processing by Tompkins.
2.Computerized Data Acquisition and Analysis for the Life Sciences by Simon S. Young.