AMMT22 DESIGN OF MECHATRONICS SYSTEM

UNIT-1 INTRODUCTION TO MECHATRONICS SYSTEM

1.1 Key elements- Mechatronics Design process- Design Parameters
1.2 Traditional and Mechatronics designs
1.3 Advanced approaches in Mechatronics- Industrial design and ergonomics, safety.

UNIT-2 SYSTEM MODELLING

2.1 Introduction-model categories-fields of application-model development-model verification-
2.2 Model validation-model simulation-design of mixed systems-electro mechanics design
2.3 Model transformation domain-independent description forms-simulator coupling.

UNIT-3 REAL TIME INTERFACING

3.1 Introduction-selection of interfacing standards Elements of Data Acquisition & control
3.2 Systems- Over view of I/O process, General purpose I/O card and its installation,
3.3 Data conversion process, Application Software- Lab view Environment and its applications,
3.4 Vim-Sim Environment & its applications -Man machine interface.

UNIT-4 CASE STUDIES ON MECHATRONIC SYSTEM

4.1 Introduction- Fuzzy based Washing machine- pH control system
4.2 Autofocus Camera, exposure control- Motion control using D.C Motor & Solenoids
4.3 Engine management systems- Controlling temperature of a hot/cold reservoir using PID
4.4 Control of pick and place robot – Part identification and tracking using RFID
4.5 Online surface measurement using image processing

UNIT-5 MICRO MECHATRONIC SYSTEM

5.1 Introduction- System principle- Component design
5.2 System design- Scaling laws- Micro actuation
5.3 Micro robot- Micro pump- Applications of micro mechatronic components.

References Books:

1. Bishop, Robert H, "Mechatronics Hand book", CRC Press, 2002.
2. Bradley, D.Dawson, N.C. Burd and A.J. Loader, "Mechatronics: Electronics in Products and Processes", CRC Press 1991 , First Indian print 2010.
3. De Silva, "Mechatronics: A Foundation Course", Taylor & Francis, Indian Reprint, 2013