KL University
Department of Electronics & Computer Engineering
M.Tech (wcsn) First Semester 2015-2017

Course Code : 15-EM5112
Course Title : Data Acquisition And Hardware Networks
Course Structure : 3-0-2
Credits : 4

SYLLABUS:

UNIT-I: Power Supplies & Filters

Amplifiers-Instrumentation amplifiers-isolation-chopper and low drift amplifier -Lock- in amplifiers electrometer and trans-impedance amplifiers-modulation-filters-Constant voltage and constant current regulators, DC-DC converter, SMPS. D/A converters,
Comparator,PLL.

UNIT-II:Sensor Signal Conditioning Circuits

Signal conditioning for resistive sensors, Reactive variation sensors and Self generating sensors-Error budget analysis.

UNIT-III: Basic Signal Conversion and Communication

RS232 interface standard, S485 interface standard. Distributed and stand alone data loggers, IEEE488 standard. methods of frequency-to-code conversion-standard, indirect and combined counting method, two wire transmission-four wire, six wire sensing.

UNIT-IV:Data Acquisition Methods for Multi Channel Sensor Systems

Data acquisition method with time-division channeling, data acquisition with space- division channeling, and main errors of multi channel data-acquisition systems, data transmission and error protection.

Unit-V:Serial Communication &Networks

Serial data communication –transmission modes,SPI,I^2C, CAN. Examples of Implementation on a 8051 based microcontroller.
Interfacing: memory interfacing, linear variable Differential Transformer (LVDT), speed measurement (RPM meter), Digital Thermometer

Text books:

1. Jacob Fraden, “Hand Book of Modern Sensors: physics, Designs and Applications”, 3rd edition, Springer, 2003.
2. Jon.S. Wilson, “Sensor Technology Hand Book”, Elsevier Inc., 2005.

Reference Books

1. Pallas Areny. R, Webster. J. G, “Sensors and Signal conditioning”, 2nd ed. John Wiley and Sons, 2001.
2 Taylor H Rosemary, “Data Acquisition for Sensor Systems”, Kluwer Academic Publishers Group, 1997
3. Microcontrollers (Theory & Applications) –A.V. Deshmuk, WTMH 2005
4Embedded Systems Architecture, programming and Design 2nded.Rajkaml McGraw –Hill.