

EC818 Bio-Medical CMOS ICs

UNIT I

Introduction to Bio-Medical CMOS ICs: Introduction to Bioelectricity, Electrical Properties of the Human body, Equivalent Circuit Model of Tissues and Organs, Biomedical Devices, Current Research Trends in Biomedical Electrical Instruments.

UNIT II

Electrode Design, Modern Disposable Electrodes, Solid Conductive Adhesive Electrodes, Implant Electrodes, Microelectrodes, Electrode Standards.

UNIT III

Readout circuits: Biopotential Acquisition, Power Efficient Instrumentation Amplifier Topologies for Biopotential Signal Extraction, Current Mode Instrumentation Amplifiers, Examples of ICs for Biopotential Acquisition.

UNIT IV

Basic operation principles and architectures as well as the most recent research results of low power CMOS ICs. Low power ADCs for Bio-Medical Applications, Low Power Bio-Medical DSP.

UNIT V

Bio-Medical Wireless Communication, Introduction to Short distance Wireless Communications.

Text Books

1. Hoi-Jun Yoo, Chris van Hoof, "Integrated Circuits and Systems- Bio Medical CMOS ICs", Springer, 2010
2. D C Reddy "Biomedical Signal Processing: Principles and Techniques", Tata McGraw-Hill Publishing Co. Ltd, 2005

Reference Books

1. R M Rangayyan "Biomedical Signal Analysis: A case Based Approach", IEEE Press, John Wiley & Sons. Inc, 2002
2. Handbook of Modern Sensors: Physics, Designs, and Applications by Jacob Fraden.
3. The Measurement, Instrumentation and Sensors Handbook vol. 1 & 2, by J. G. Webster

Semester
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22/1/15

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