

Syllabus Biosensors

Biomedical Engineering

Lecture 1

- Sensors & Transducers (Types, Examples & General Electronic Sensor)

Lecture 2

- Actuator
- Measurands Sensors (Biological Measurands)
- Biosensors

Lecture 3

- Generalized Medical Instrumentation System (Basic elements of system measurement)

Lecture 4

- Sensor/transducers specifications (Range, Span, Zero, Drift, Sensitivity, Zero Drift, Dead space, Resolution, Threshold, Precision . . .)

Lecture 5

- Temperature Measuring Devices (Causes the Thermocouple Voltage, Basic Theory & Peltier Effect)

Lecture 6

- Empirical Laws of Thermocouples, Measuring Thermocouple Voltage, Thermocouple Basic & Reference Circuit

Lecture 7

- Cold-Junction Compensation, Types of Thermocouple Junctions & Examples

Lecture 8

- Thermo-resistive Sensors and Silicon-resistive sensors (Resistance Temperature Detectors (RTDs))

Lecture 9

- Electronic materials, Silicon Resistive Sensors & Thermistors

Lecture 10

- Mechanical Sensors and Actuators - Force Sensors (Strain Gauges & Semiconductor Strain Gauges)

Lecture 11

- Accelerometers, Capacitive Accelerometers, Magnetic Accelerometers & Position and Displacement Sensing

Lecture 12

- Pressure Sensors, Piezo-resistive Pressure Sensors & Velocity Sensing

Lecture 13

- Chemical Sensor & electrochemical sensor

Lecture 14

- Potentiometric Sensors.