



**National Institute of Technology Meghalaya**  
An Institute of National Importance

**CURRICULUM**

Programme	<b>Bachelor of Technology in Electronics and Communication Engineering</b>	Year of Regulation	<b>2018-19</b>
Department	<b>Electronics and Communication Engineering</b>	Semester	<b>V</b>

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
<b>EC 371</b>	<b>MICROSENSOR TECHNOLOGY</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>50</b>	<b>50</b>	<b>100</b>	<b>200</b>

Course Objectives	Course Outcomes	
	To understand the fundamental concepts, working principles and applications of Microsensors	CO1 Understand the fundamental concepts and applications of Microsensors
	To design various types of Microsensors based on resistive, capacitive, piezoelectric and thermal transduction mechanisms.	CO2 Apply the concept of various transduction mechanisms for the design of Microsensors
To make students understand the fabrication technologies and materials for Microsensors	CO3 Understand the materials and fabrication technologies for Microsensors.	

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
1	CO1	2	2	-	-	-	-	-	-	-	-	-	-	2	1	-	-
2	CO2	2	2	-	-	-	-	-	-	-	-	-	-	2	1	-	-
3	CO3	2	2	-	-	-	-	-	-	-	-	-	-	2	1	-	-

**SYLLABUS**

No.	Content	Hours	COs
I	<b>Basics of Sensor and Measurement Systems</b> General Concepts And Terminology, Sensor Classification, General Input-Output Configuration, Characteristics of Measurement Systems, Basic mechanical structures for Microsensors	<b>6</b>	<b>CO1</b>
II	<b>Transduction mechanisms in Microsensors</b> Piezoresistive, Capacitive, Piezoelectric and Thermal transduction techniques for Microsensors	<b>6</b>	<b>CO2</b>
III	<b>Technologies and materials for Microsensors</b> Materials used for making Microsensors and their fabrication techniques	<b>6</b>	<b>CO3</b>
IV	<b>Case studies of selected Microsensors</b> Piezorsisive pressure sensor, Capacitive pressure sensor, Piezoelectric sensor and Temperature sensor	<b>6</b>	<b>CO1, CO2, CO3</b>
<b>Total Hours</b>		<b>24</b>	

**Essential Readings**

- Gardner J.W., Varadan V.K., Awadelkarim O.O., "Microsensors, MEMS and Smart Devices", John Wiley & Sons Ltd, 1<sup>st</sup> Ed., 2001.
- Chang Liu, "Foundations of MEMS", Pearson, 2<sup>nd</sup> Edition, 2012.

**Supplementary Readings**

- Ghosh A. K., "Introduction to Transducers", Prentice-Hall India, 1<sup>st</sup> Ed., 2015.
- Patranabis D., "Sensors And Transducers", Prentice-Hall India, 2<sup>nd</sup> Ed., 2004.
- Frank R., "Understanding Smart Sensors", Artech House, 2<sup>nd</sup> Ed., 2000.