**Department of Instrumentation and Control Engineering**

**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

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| **COURSE OUTLINE TEMPLATE** |
| Course Title | Sensors and Transducers |
| Course Code | IC PC11 | No. of Credits | 3 |
| Department | ICE | Faculty | Section A: Dr. G. Uma |
| Pre-requisitesCourse Code | NIL |
| Course Coordinator(s)(if, applicable) | Not Applicable |
| Other CourseTeacher(s)/Tutor(s)E-mail | guma@nitt.edu | Telephone No. | 04312503359 |
| Course Type | **Core course**   |
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| **COURSE OVERVIEW** |
| The course consist of basic concepts of Measurement system, its characteristics and its design, with emphasis on different types transducers and its conditioning circuits. Basic introduction to Microsensors ,its fabrication and flexible sensors is also covered. |
| **COURSE OBJECTIVES** |
| 1. 1. To expose the students to various sensors and transducers for measuring mechanical quantities.2. To make the students familiar with the specifications of sensors and transducers.3. To teach the basic conditioning circuits for various sensors and transducers. 4. To introduce about advancements in sensor technology.  |
| **COURSE OUTCOMES (CO)** |
| Course Outcomes | Aligned Programme Outcomes(PO) |
| 1. Familiar with the basics of measurement system and its input, output configuration of measurement system**.**2. Familiar with both static and dynamic characteristics of measurement system.3. Familiar with the principle and working of various sensors and transducers.4. Able to design signal conditioning circuit for various transducers.5. Able to identify or choose a transducer for a specific measurement application. | 11,61,31,61,6 |
| **COURSE TEACHING AND LEARNING ACTIVITIES** |
| **S. No** | **Week** | **Topic** | **Mode of Delivery** |
| 1 | 10.7.18 to 10.8.18  | General concepts of design of measurement system and its characteristics | Lecture and power point presentation.Discussion and presentation by students. |
| 2. | 13.8.18 to 31.8.18 | Resistive transducers introduction, design of signal conditioning circuit and its application. | Lecture and power point presentation.Discussion and presentation by students. |
| 3 | 3.9.18 to 21.9.18 | Inductance and capacitive Transducers introduction, it’s conditioning circuits and application.Speed measuring transducers | Lecture and power point presentation.Invited talk by Industrial experts |
| 4 | 24.9.18 to 12.10.18 | Piezo electric transducers its signal conditioning circuits, seismic transducer model and its discussion, and photoelectric and Hall effect transducer | Lecture and power point presentation.Discussion and presentation by students. |
| 5 | 15.10.18 to31.10.18 | Introduction to Semiconductor sensors, materials, scaling issues and its fabrication and design tools. Brief discussion on Digital Displacement sensors smart sensors and flexible sensors. | Lecture and power point presentation.Invited talk by Industrial experts |
| **COURSE ASSESSMENT METHODS** |
| **S. No** | **Mode of Assessment** | **Week/Date** | **Duration** | **% Weightage** |
| 1.2.3. | Unit Test IUnit Test IIFinal Assestment | 3th week of Aug-20182nd week of Oct-20182ndweek of Nov-2018 | 1 hour 30min1 hour 30 min3 hours | 20%20%40% |

