

**DEPARTMENT OF INSTRUMENTATION AND CONTROL ENGINEERING**  
**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

COURSE PLAN – PART I			
Course Title	INSTRUMENTATION AND CONTROL LABORATORY		
Course Code	MTLR12	No. of Credits	2
Course Code of Pre-requisite subject(s)	MTPC16	INSTRUMENTATION AND CONTROL	
Session	Jan. 2018	Section (if, applicable)	—
Name of Faculty	B.S. Thamarai Selvi K. Lakshmi	Department	ICE
Email	<a href="mailto:thamaraibs@nitt.edu">thamaraibs@nitt.edu</a> <a href="mailto:lakshmik@nitt.edu">lakshmik@nitt.edu</a>	Telephone No.	8344113216, 9940934251
Name of Course Coordinator(s) (if, applicable)	-NIL-		
E-mail	-NIL-	Telephone No.	-NIL-
Course Type	Core course		
<b>Syllabus (approved in BoS)</b>			
<ol style="list-style-type: none"> <li>1. Measurement of strain using strain gauges.</li> <li>2. Measurement of displacement using LVDT.</li> <li>3. Measurement of pressure.</li> <li>4. Measurement of temperature using RTD.</li> <li>5. Measurement of temperature using TC.</li> <li>6. Measurement of temperature using Thermistor.</li> <li>7. Simple exercise on 8085 Microprocessor.</li> <li>8. Simulation ON/OFF,P, PI, PID controller design using MATLAB.</li> <li>9. Simple exercise based on PLC instructions.</li> </ol>			
<b>COURSE OBJECTIVES</b>			
To measure the basic mechanical parameters like strain, torque, load, displacement, pressure and temperature through the electronic and PC based methods			

COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
1. Construct strain gauge to measure the strain and torque and analysis. 2. Construct a circuit to measure load, displacement using load cells and LVDT respectively. 3. Design of pressure measurement device and analysis. 4. Construction and analysis of temperature measurement devices and their selections. 5. Construction and analysis of design of PD, PID and PLC control devices.	

**COURSE PLAN – PART II**

**COURSE OVERVIEW**

The objective of this course is to provide the practical knowledge about the characteristics and working of measuring instruments and control of various process using PLC and MATLAB. This course also provides the knowledge of performing basic operations using 8085 microprocessor.

**COURSE TEACHING AND LEARNING ACTIVITIES**

S.No.	Week	Topic	Mode of Delivery
1	I	Measurement of strain using strain gauges.	Conduction of experiments
2	II	Measurement of displacement using LVDT	
3	III	Measurement of temperature using RTD.	
4	IV	Measurement of temperature using TC.	
5	V	Measurement of temperature using Thermistor	
6	VI	Simple exercise on 8085 Microprocessor.	
7	VII	Simulation ON/OFF, P, PI, PID controller design using MATLAB	
8	VIII	Simple exercise based on PLC instructions.	

**ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc**

1. John P. Bentley., "Principles of Measurement Systems" 3rd edition, Addison Wesley Longman Ltd., UK, 2000.
2. Neubert H.K.P., "Instrument Transducers: An Introduction to their performance and Design, 2nd Edition Oxford University Press, Cambridge, 1999.
3. Ramesh Goankar, "Microprocessor architecture, Programming and applications, with the 8085/8080A", 3rd edition, Penram International Publishing house, 2002
4. Patranabis, "Sensors and Transducers", Wheeler Publishing, 1999.
5. Doebelin E.O, " Measurement system-applications and design", 4th edition McGraw Hill New York 2003

## COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week	Duration	% Weightage
1	Experiment conduction and record maintainece	During every week	-----	50
2	Objective test	X week	2 hours	50

**COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)**

1. Direct feedback from the students.
2. Feedback from the students during the class committee meetings.

**COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)**

### ATTENDANCE

- The minimum attendance for passing this course is 75%.
- Students who have less than 75% of attendance have to rejoin the course after a year along with the next batch. V indicates prevention due to lack of attendance.

### Grading:

Relative grading will be used to award grades. The passing minimum will be class average/2 or class maximum/3, whichever is lower.

### FOR APPROVAL

Course Faculty

B.S. Thamarai Selvi  
B.S. Thamarai Selvi

K. Lakshmi  
23/01/18  
(K. LAKSHMI)

CC-Chairperson

[Signature]

HOD

[Signature]  
24-1-18

**HEAD**

**METALLURGICAL & MATERIALS ENGG. DEPT.  
NATIONAL INSTITUTE OF TECHNOLOGY,  
TIRUCHIRAPPALLI - 620 015.**