NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.TECH. / Mechanical Engineering		
Course Title	Mechatronics Lab		
Course Code	MELR19	No. of Credits	1
Course Code of Pre-requisite subject(s)	MEPE26 Mechatronics		
Session	July 2019	Section (if, applicable)	A & B
Name of Faculty	Karthick P / TF	Department	ICE
Official Email	karthip@nitt.edu	Telephone No.	9791020479
Name of Course Coordinator(s) (if, applicable)	NA		
Official E-mail	-	**Telephone No.**	-
Course Type (please tick appropriately)	☑ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

- Modelling and analysis of basic hydraulic, pneumatic and electrical circuits using Fluid SIM Software
- Study of PLC and its applications
- Study of image processing technique
- Traffic light interface
- Study of various types of transducers

COURSE OBJECTIVES

1. To know the method of programming the microprocessor and also the design, modelling & analysis of basic electrical, hydraulic & pneumatic
2. Systems which enable the students to understand the concept of mechatronics

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
At the end of the course student will able to design mechatronics system with the help of Microprocessor, PLC and other electrical and Electronics Circuits.	1,2,3,4,5,11

COURSE PLAN – PART II

COURSE OVERVIEW

The Mechatronics Lab provides experimental setups to learn the field of mechatronics starting from various sensors. This course covers the fundamental units of signal conditioning circuits, basic pneumatic circuits for controlling applications, HMI drives, and applications of PLC through real

time examples. Students can apply mechanical engineering, electrical engineering skills to problems and challenges in the areas of mechatronics engineering.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Contact Hours	Topic	Mode of Delivery
1	3	Study of various types of transducers a) RTD b) Thermocouple c) LVDT	Experiment
2	3	a) Inverting, Non Inverting Amplifier b) Integrator and Differentiator	Experiment
3	3	a) Waveform Generator b) V/I and I/V Converter	Experiment
4	3	Electronic PID Controller	Experiment
5	3	Time domain and Frequency domain analysis of RLC circuits	Experiment
6	3	a) Adders, Subtractors b) Counters	Experiment
7	3	Design of ON/OFF Control using Ardunio	Experiment
8	3	Study of PLC and its applications a) Ladder logic for basic gates b) Ladder logic for given boolean function c) Timer, Counter d) Bottle filling application	Experiment
9	3	Modelling and analysis of basic pneumatic, Hydraulic circuits using Fluid SIM Software (Actuation of double acting cylinder)	Experiment
10	3	Traffic light interface_ Human Machine Interface (HMI)	Experiment
11	3	Speed control of AC motor using Drives	Experiment
12	3	Compensation Class	
13	3	Compensation Class	

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week	Duration	% Weightage
1	Pre-lab preparation (05) Conduct of experiment (05) Output verification (10) Record (20)	Every lab session	-	40%
2	Viva	Nov 2nd Week		10%
3	End semester exam	Nov 2nd Week	2 Hours	50%

COURSE EXIT SURVEY

Direct feedback from the student and also feedback of the students from the class committee meeting will be used to access the course.

COURSE POLICY

- Relative grading will be used to award the marks
- Two compensation lab hours will be conducted for the students who absent for lab classes.

- The passing minimum for this course 35% or Class average/2 whichever is greater.
- Students who fail in the course and those who absent for the final assessment has to write Reassessment provided that they had satisfied 65% attendance requirement.
- Student fail in Reassessment has to do Formative Assessment.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- The minimum attendance for passing this course is 75%
- However, 10 % of relaxation can be considered for OD and on genuine medical grounds
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.
- Students who have less than 65% have to Redo the course.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

ADDITIONAL INFORMATION, IF ANY

Nil

FOR APPROVAL

Course Faculty KARTHICK.P. TF/ICE 6/3/19 CC- Chairperson _____ HOD _____