NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF INSTUMENTATION AND CONTROL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech / INSTRUMENTATION AND CONTROL ENGINEERING		
Course Title	INDUSTRIAL AUTOMATION AND PROCESS CONTROL LABORATORY		
Course Code	ICLR17	No. of Credits	2
Course Code of Pre-requisite subject(s)	-----		
Session	July 2019	Section (if, applicable)	A
Name of Faculty	Dr. N. Sivakumaran	Department	Instrumentation and Control Engineering
Official Email	nsk@nitt.edu	Telephone No.	9443745705
Course Type (please tick appropriately)	✓ Core course	☐ Elective course	

Syllabus (approved in BoS)

COURSE OBJECTIVES

1. To impart practical knowledge in PC based data acquisition, analysis and control of different process trainers.
2. To teach the industrial automation concept and programming techniques.
3. To familiarize the process modeling and control using simulation tools.

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Design PID controller and tune the same for various process.	1,2,3,4
2. Implement sequential logic control using PLC for a required application.	4,5
3. Use the simulation tools for the design of controller for various process	1,3,4,5

COURSE PLAN – PART II

COURSE OVERVIEW

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1st – 5th Week	Design and development of PID controller for FOPDT process using different tuning techniques.	Design and Simulation
2		Study and experimentation on I/P and P/I converter	Real time Experimentation
3		Study the effect of P/PI/PID in using real time process trainer.	
4		Design of ON/OFF controller and ON/OFF controller with hysteresis using real time process trainer.	
5,6		Student has to finish two experiments from Siemens COE, NIT Trichy	
7	6th - 9th Week	Design of Cascade Controller and evaluation of Servo and regulatory performance in simulation environment	Simulation
8		Design of Feed forward and Feedback controller design using real time multi process trainer	Real time Experimentation
9		Design and development of Z-N closed loop PID controller using technique using real time process trainer	Simulation and real time Experimentation
10		Study of Distributed Control System using CENTUM VP	
11,12		Student has to finish two experiments from Siemens COE, NIT Trichy	
13	10th – 12th Week	Feed forward and Feedback controller development using Functional Block instruction of Distributed Control System	Simulation and real time Experimentation

14		Study of Control Valve characteristics (Equal Percentage, Linear and Quick opening)	Real time Experimentation
15,16		Student has to finish two experiments from Siemens COE, NIT Trichy	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Record completion and Inference	Ist - 4th Week	-	20%
2	Record completion and Inference	5th - 9th Week	-	30%
3	Record completion and Inference	10th - 13th Week	-	20%
4	Practical Examination	14th Week	2 hours	30%

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

1. Indirect feedback through questionnaire.
2. Direct feedback from the students.
3. Feedback from the students during the class committee meetings.

COURSE POLICY (including compensation assessment to be specified)

The course is laboratory in nature. It is conducted in ICE Department and Seimens Centre of excellence, NIT Trichy. Hence no compensation exam will be at the end. Every laboratory class is considered as for the student evaluation. Hence, if the student absents for genuine reason, compensation lab class will be conducted whenever necessary.

Retest / Re-examination:

If the student got less than 35% of marks with satisfactory attendance requirement (Refer Attendance policy), he/she has to undergone retest / supplementary examination.

Retest / Supplementary examination will be conducted as per the institute norms.

Passing Criteria / Awarding Grades:

35% is the minimum passing criteria for this subject. If the student got less than 35% even after reexamination and absent for reexamination, he/ she should undergo formative assessment. Other grades are awarded based on relative grades as per institute norms.

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

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

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.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

1. Students can meet any time depends on their mutual availability.
2. The course faculty will be available in ICE department ground floor inside process control lab in his cabin. For further information and doubts contact to the mail nsk@nitt.edu
3. Minor doubts will be clarified during the class hours.

FOR APPROVAL

Course Faculty _____ **CC- Chairperson** 13/8/19 **HOD** 13/8/19

Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.