DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

WHEN THE RESIDENCE OF THE PROPERTY OF THE PROP		COURSE PLAN						
Degree	B.Tech.	Course Title	CONTR	ROL SYS	STEMS			
Course Code	EEPC20		No. of	Credits		04	2545	
Course Code of Pre- requisite subject(s)				911				
Session	JULY 202	23	Section	1		Illrd	yr, B	
Name of Faculty	Dr. Ankur Singh Rana		Depart	ment	EEE			
Name of Course Coor	dinator(s) (i	f, applicable)	-					
Email	ankur@n	itt.edu	Teleph	Telephone No. 0431-250327		3276		
Course Type	√ Co	ore course	Elect	ive cour	rse			
SYLLABUS (APPROVI	ED IN BOS)							
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COURSE PLAN - PART II

COURSE OVERVIEW

This course on control systems involves time domain and frequency domain analysis of system. It also deals with stability analysis and various controller designs for a system.

COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic .	Mode of Delivery
1.	Week 1 31 Jul - 4 Aug 2023 (4 Contact hour)	Introduction to Control Systems with Examples Concept of open loop, closed loop, LTI system, transfer functions	Benvery
2.	Week 2 07-11 Aug 2023 (4 Contact hours)	Modeling of physical systems and its transfer functions - Mechanical systems	erutil :
3.	Week 3 14 - 18 Aug 2023 (4 Contact hours)	Modelling of physical systems: Electrical systems - Electromechanical systems, Thermal systems.	
4.	Week 4 21 - 25 Aug 2023 (4 Contact hour)	Time domain analysis: Time-domain specifications	
5.	Week 5 28 Aug - 1 Sep 2023 (4 Contact hours)	Analysis of steady state error for various inputs based on types and order of the systems	e Hardina Discolari
6.	Week 6 4- 8 Sep 2023 (4 Contact hours)	Routh and Hurwitz conditions for stability	
7.	Week 7 11 – 15 Sep 2023 (4 Contact hours)	Routh and Hurwitz conditions First Assessment	Lecture / Tutorial
8.	Week 8 18 – 22 Sep 2023 (4 Contact hour)	Introduction to Routh-locus method Routh-locus method	C & T / PPT any suitable
9.	Week 9 25 -29 Sep 2023 (0 Contact hours)	Academic Break	mode
10.	Week 10 2 – 6 Oct 2023 (3 Contact hours)	Introduction to frequency response analysis	
11.	Week 11 9 – 13 Oct 2023 (4 Contact hours)	Bode-plot	
12.	Week 12 16 – 20 Oct 2023 (4 Contact hours)	Nyquist plot and Nyquist stability criterion	
13.	Week 13 23 – 27 Oct 2023 (3 Contact hours)	Introduction to controller design	
14.	Week 14 30 Oct – 3 Nov 2023 (4 Contact hours)	Controller design: Design of P, PI, PID Second Assessment	
15.	Week 15 6 – 10 Nov 2023 (4 Contact hours)	lag, lead, lead-lag compensator design	

16.	Week 16 13 – 17 Nov 2023 (4 Contact hours)	Numerical Solving/Tutorial	
17.	Week 17 20 – 24 Nov 2023	Numerical Solving/Tutorial Compensation Assessment	an physical
18.	Week 18 27 Nov - 01 Dec 2023		
19.	Week 19 & 20 04 - 15 Dec 2023	End Semester Examination (Final Assessment)	

C & T: Chalk and Talk and PPT: Power Point

COURSE ASSESSMENT METHODS

S.No.		Week/Date	Duration	% Weightage
1	Ist Class Test	Week 7 11 – 15 Sep 2023	60 minutes	20
2	II nd Class Test	Week 14 30 Oct – 03 Nov 2023	60 minutes	20
3	Assignment: 1 Surprise-quiz: 2	 Throughout semester Assignment: Solutions for the questions (from first class to last class) needs to be submitted in Week 17 Surprize-quiz: Out of 2, best 1 will be considered Note: No compensation for surprize-quiz 		5+15=20
СРА	Compensation Assessment	Week 1 7 20 – 24 Nov 2023	60 minutes	20
4	Final Assessment	Week 18/19/20	180 minutes	40

Note:

- 1. Exact date and time for the assessments will be as per the Office of the Dean (Academic) instructions.
- 2. Attending all the assessments (i.e., Assessment 1 to 4) is MANDATORY for every student.
- 3. If any student is not able to attend Assessment-1 / Assessment-2/ both assessment due to genuine reason, he/she will be permitted to attend the Compensation Assessment (CPA) with 20% weightage (20 marks).
- 4. In any case, CPA will not be considered as an improvement test.

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

- 1. Katsuhiko Ogata, 'Modern Control Engineering', Pearson Education Publishers, 5th Edition, 2010.
- 2. Nagrath I.J. and Gopal M, 'Control Systems Engineering', New Age International Publications, 5th Edition, 2010.
- 3. Richard C. Dorf and Robert H. Bishop. 'Modern control systems', Pearson Prentice Hall Publications, 12th Edition, 2010.
- 4. Gene F. Franklin, J. David Powell and Abbas Emami-Naeini, 'Feedback control of Dynamic

Systems', Pearson Education India Publications, 6th Edition, 2008.

5. Benjamin C.Kuo and Farid Golnaraghi, 'Automatic Control Systems', John Wiley & Sons Publications, 8th Edition, 2002.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

- Feedback from the students during class committee meetings
- Anonymous feedback through questionnaire (Mid of the semester & End of the semester)
- End semester feedback on course outcomes

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

- 1. Attending all the assessments mandatory for every student
- One compensation assessment will be conducted for those students who are being physically absent for the assessment 1 and/or 2, only for the valid reason.
- 3. At any case CPA will not be considered as an improvement test.
- 4. Absolute/Relative grading will be adopted for the course.

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

- 1. At least 75% attendance in each course is mandatory.
- 2. A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with attendance shortage 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.
- 4. The above policy against academic dishonesty shall be applicable for all the programmes.

Course Faculty ____ CC-Chairperson ____ HOD AMAGE 2: