



Zagdu Singh Charitable Trust's (Regd.)

THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Govt. of Maharashtra & Affiliated to University of Mumbai*)
(Accredited Programmes by National Board of Accreditation, New Delhi**)

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Shyamnarayan Thakur Marg, Thakur Village,
Kandivali (East), Mumbai - 400 101.

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ISO 9001 : 2008 Certified

*Permanent Affiliated UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology (w.e.f. A.Y. 2015-16 onwards)

**1st time Accredited UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology

**2nd time Accredited UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology • Electronics Engineering (3 years w.e.f. 01-07-2016)

TCET/FRM/IP-02/09

Revision: A

Semester Plan (Theory)

Semester: III

Course: EXTC

Subject: Electronic Instrumentation & Control

Class: SE B

Sr. No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1.	Prerequisite course: Basics of linear differential equation of first order, second order system, Kirchoff's current and Kirchoff's voltage law, basic instruments	4 hrs	Self learning and classroom revision	1. D. A. Neamen, "Electronic Circuit Analysis and Design," Tata McGraw Hill, 2nd Edition. 2. G. V Kumbhojkar, "Applied Mathematics,"

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1	-	L1.1	Subject orientation	PPT	10/07/17	-	
2	-	L1.2	Orientation of OBE	PPT	11/07/17	-	
3	M4	L1.3	Open loop and closed loop systems, example of control systems	Black board	13/07/17	4.1	
4		L1.4	Modelling of system using Transfer function	Black board	14/07/17	4.2	
5		L2.1	Finding TF for given circuit-problems	Black board	17/07/17	4.3	
6		L2.2	Block diagram reduction rule	PPT	18/07/17	4.4	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
7		L2.3	Problem solving using using BD rule	PPT	19/07/17	4.5	
8		L2.4	MIMO SYSTEM :problem solving,	PPT	20/07/17	4.6	
9		L2.5	Introduction to Signal Flow Graph(SFG)	PPT	21/07/17	4.7	
10		L3.1	Mason's gain formula :problem solving	PPT	24/07/17	4.8	
11		L3.2	Problems based on SFG reduction	PPT	25/07/17	4.9	
12		L3.3	Dynamic response of System: Standard test signals and steady state errors	PPT	26/07/17	4.10	
13		L3.4	Analysis of second order systems	PPT	27/07/17	4.11	
14	M5	L4.1	Concept of stability ,relative stability and absolute stability Stability analysis:Routh criteria	PPT	31/07/17	5.1	
15		L4.2	Stability analysis using Routh special cases	PPT	01/08/17	5.2	
16		L4.3	Root Locus :Basic rules of Root locus drawing.	PPT	02/08/17	5.3	
17		L4.4	Root Locus: remaining rules of Root locus drawing.	PPT	03/08/17	5.4	
18		L5.1	Problem solving using root locus	PPT	07/08/17	5.5	
19		L5.2	Design of lead and lag compensator	PPT	08/08/17	5.6	
20	M6	L5.3	Frequency domain specification, Relationship between time and frequency domain specification of system	PPT	09/08/17	6.1	
21		L5.4	Bode plot rules ;constant, pole-zeros at origin ,simple poles	PPT	10/08/17	6.2	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
22		L6.1	Draw bode plot for given function using all rules	PPT	14/08/17	6.3	
23		L6.2	Draw bode plot for given function using all rules	PPT	16/08/17	6.4	
24		L7.1	Calculation of gain and phase margin and prediction of stability	PPT	24/08/17	6.5	
25		L8.1	Frequency response analysis of RC,RL,RLC circuits	PPT	30/08/17	6.6	
26		L8.2	Bode plot for second order function	PPT	31/08/17	6.7	
27		L9.1	Introduction of polar plots:	PPT	04/09/17	6.8	
28		L9.2	Problem solving using polar plots	PPT	06/09/17	6.9	
29		L9.3	Introduction to NYQUIST PLOT	PPT	07/09/17	6.10	
30		L10.1	Problem solving using Nyquist plot	PPT	11/09/17	6.11	
31		L10.2	Problem solving using Nyquist plot	PPT	12/09/17	6.12	
32	M1	L10.3	Components of generalized measurement system Concept of accuracy, precision, linearity, sensitivity, resolution, hysteresis, calibration.	PPT	13/09/17	1.1	
33		L10.4	Kelvin's double bridge, Wheatstone bridge	PPT	14/09/17	1.2	
34		L11.1	Mega ohm bridge, Maxwell bridge and Hey bridge	Black board	18/09/17	1.3	
35		L11.2	Schering bridge	Black board	19/09/17	1.4	
36		L11.3	Q-Meter: Operating principle and applications	Black board	20/09/17	1.5	

Sr. No	Module No.	Lesso n No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
37		L11.4	Energy and power meters: Working of energy and power meter	PPT	21/09/17	1.6	
38	M2	L12.1	Basics of sensors and Transducers-Active and passive transducers, characteristics and selection criteria of transducers,	PPT	25/09/17	2.1	
39		L12.2	Working principle of Eddy-current sensors, Pizoelectric transducers, photoelectric and photovoltaic sensors, capacitive sensors	PPT	26/09/17	2.2	
40		L13.1	Potentiometers, pressure gauges, linear Variable differential transformers(LVDT)	PPT	03/10/17	2.3	
41		L13.2	Resistance temperature detectors(RTD). Thermistors and thermocouples , their ranges and applications	PPT	04/10/17	2.4	
42	M3	L13.3	Introduction and characteristics, Landline Telemetry, Radio Telemetry Types of Multiplexing Systems,	PPT	05/10/17	3.1	
43		L14.1	Data Acquisition: Components of Analog and Digital Data Acquisition System,	PPT	12/10/17	3.2	
44		L15.1	Modern Digital Data Acquisition System.	PPT	16/10/17	3.3	
45		L15.2	Uses of Data Acquisition System, Use of recorders in Digital systems	PPT	17/10/17	3.4	
46		L15.3	University paper discussion.	PPT	18/10/17		
Remark:: Course:		Syllabus Coverage:		Practice Session:		Beyond Syllabus:	
No. of (lectures planned)/(lecture taken):							

Bridge courses Objective: Bridging of gaps with respect to prerequisites and industry skills or to carryout research in signal processing field. (20 Hrs / Semester / student)

Sr . No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
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1	Advanced course: 1. Control engineering –Design perspective (NPTEL Course) 2. Industrial Instrumentation (Swayam course)	12week	NPTEL, Swayam videos and with practice session	1. https://onlinecourses.nptel.ac.in/noc17_ee12/preview 2. Stanley M. Shinnars, "Modern Control System Theory and Design", 2 nd edition. 3. Feedback Systems: An Introduction for Scientists and Engineers, by Karl Astrom and Richard M. Murray. 4. https://swayam.gov.in/course/3764-industrial-instrumentation 5. Alok Barua, <i>Fundamentals of Industrial Instrumentation</i> , Wiley India, New Delhi 2011
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Text Books:

1. A.K. Sawhney, "Electrical & Electronic Measurement & Instrumentation" – DRS . India
2. M.M.S. Anand, "Electronic Instruments and instrumentation Technology".
3. H.S.Kalsi, "Electronic Instrumentation"-TMH, 2nd Edition.
4. Nagrath, M.Gopal, "Control System Engineering", Tata McGraw Hill.
5. K.Ogata, "Modern Control Engineering, Pearson Education", IIIrd edition.

Reference Books:

1. Helfrick&Copper, "Modern Electronic Instrumentation & Measuring Techniques" – PHI
2. W.D. Cooper, "Electronic Instrumentation And Measuring Techniques" – PHI
3. Benjamin C.Kuo, "Automatic Control Systems, Earson education", VIIth edition
4. Rangan C. S., Sarma G. R. and Mani V. S. V., "Instrumentation Devices And Systems", Tata McGraw-Hill, 2nd Ed., 2004.
5. Bell David A. "Electronic Instrumentation and Measurements", PHI Pearson Education, 2006.
6. Madan Gopal, "Control Systems Principles and Design", Tata McGraw hill, 7th edition, 1997.
7. Normon, "Control System Engineering", John Wiley & sons, 3rd edition

Sd/-
Ms. Amruta Naik
Name & Signature of Faculty

Sd/-
Dr.Vineetkumar Dongre
Signature of HOD

Sd/-
Dr.R.R.Sedamkar
Signature of Dean (Academics)

Date:

Date:

Date:

Note:

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.

