TCET/FRM/IP-02/09 Revision: A

Semester Plan
(Theory)

Semester: V Course: EXTC

Subject: Random Signal Analysis Class: TE- A

S.No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1.	**Prerequisite course:** Signals and Systems	06 Hours	self learning	Principles of Linear Systems and Signals 2nd Edition -B. P. Lathi Chapter 1 (Pg. No. 1 -83) Chapter 5(Pg. No.427-526)

Class Room Teaching

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	SOP	LCD Projector	10/7/17		
2		L1.2	OBE	LCD Projector	11/7/17		
3		L1.3	RSA (Tut)	LCD Projector	13/7/17		
4	1	L1.4	Sample space, events, set operations	LCD Projector	14/7/17	M1.1	
5	1	L1.5	The notion and axioms of probability	LCD Projector	14/7/17	M1.2	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
6	1	L2.1	Baye's rule, Independence of events, Sequential Experiments.	LCD Projector	17/7/17	M1.3	
7	1	L2.2	Notion of random variable.	LCD Projector	18/7/17	M1.4	
8	1	L2.3	Continuous random variables, probability density function, probability distribution function	LCD Projector	19/7/17	M1.5	
9	1	L2.4	Uniform, Exponential and Gaussian continuous random variables and distributions.	LCD Projector	20/7/17	M1.6	
10	1	L3.1	Discrete random variables, probability mass function, probability distribution function, binomial	LCD Projector	24/7/17	M1.7	
11	1	L3.2	Probability mass function, probability distribution function, binomial	LCD Projector	26/7/17	M1.8	
12	1	L3.3	Poisson and geometric discrete random variables and distributions	LCD Projector	27/7/17	M1.9	
13	2	L3.4	Functions of a random variable and their distribution and density functions.	LCD Projector	28/7/17	M2.1	
14	2	L4.1	Expectation, Variance and Moments of random variable.	LCD Projector	31/7/17	M2.2	
15	2	L4.2	Transformation of a random variable,	LCD Projector	2/8/17	M2.3	
16	2	L4.3	Markov, Chebyshev and Chernoff bounds	LCD Projector	3/817	M2.4	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
17	2	L4.4	Characteristic functions	LCD Projector	4/8/17	M2.5	
18	2	L5.1	Moment theorem	LCD Projector	7/8/17	M2.6	
19	2	L5.2	Vector random variables, Pairs of random variables	LCD Projector	9/8/17	M2.7	
20	3	L5.3	Joint CDF, Joint PDF Independence	LCD Projector	10/7/17	M3.1	
21	3	L5.4	Conditional CDF and PDF, Conditional Expectation	LCD Projector	11/7/17	M3.2	
22	3	L6.1	One function of two random variable	LCD Projector	14/7/17	M3.3	
23	3	L6.2	Two functions of two random variables	LCD Projector	16/7/17	M3.4	
24	3	L6.3	Joint moments, joint characteristic function, covariance and correlation-independent	LCD Projector	18/7/17	M3.5	
25	3	L7.1	Uncorrelated and orthogonal random variables	LCD Projector	24/8/17	M3.6	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
26	3	L8.1	Random sequences, Limit theorems	LCD Projector	30/8/17	M3.7	
27	4	L8.2	Strong and weak laws of large numbers	LCD Projector	31/8/17	M4.1	
28	4	L8.3	Central limit theorem and its significance.	LCD Projector	1/9/17	M4.2	
29	5	L9.1	Random process: Definition, realizations, sample paths, discrete and continuous time processes	LCD Projector	4/9/17	M5.1	
30	5	L9.2	Probabilistic structure of a Random process; mean, correlation and covariance functions	LCD Projector	6/9/17	M5.2	
31	5	L9.3	Stationary random process	LCD Projector	7/9/17	M5.3	
32	5	L9.4	Ergodicity	LCD Projector	8/9/17	M5.4	
33	5	L10.1	Transmission of WSS random process through LTI system	LCD Projector	11/9/17	M5.5	
34	5	L10.2	Spectral analysis of random processes	LCD Projector	13/9/17	M5.6	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
35	5	L10.3	Power density spectrum bandwidth, cross power density spectrum	LCD Projector	14/9/17	M5.7	
36	5	L10.4	Gaussian and Poisson random process	LCD Projector	15/9/17	M5.8	
37	5	L11.1	Markov processes	LCD Projector	18/9/17	M5.9	
38	6	L11.2	Discrete Markov chains, The n–step transition probabilities, steady state probabilities	LCD Projector	20/9/17	M6.1	
39	6	L11.3	Introduction to Continuous time Markov chains.	LCD Projector	21/9/17	M6.2	
40	6	L.11.4	Classifications of states.	LCD Projector	22/9/17	M6.3	
41	6	L12.1	Markovian models	LCD Projector	25/9/17	M6.4	
42	6	L13.1	Birth and death queuing models	LCD Projector	4/10/17	M6.5	
43	6	L13.2	Steady state results.	LCD Projector	5/10/17	M6.6	
44	6	L13.3	Single and Multiple server Queuing models, Finite source models and Little's formula	LCD Projector	6/10/17	M 6.7	
45	1-6	L14.1	University paper solving	LCD Projector	12/10/17	M1 -6	
Remark:: Course:		Syllabus Coverage:		Practice Session:		Beyond Syllabus:	
No. of (lectures planned)/(lecture taken): (45) / ( )							

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)**				
S.No.	**Bridge courses/Technology**	**Duration (Week/hrs)**	**Modes of Learning**	**Recommended Sources**
1	**Advanced course:** Statistical Signal Processing (NPTEL Course)	20 Hours	Technology Based learning	www.nptel.ac.in/syllabus/117103019/

Text Books:

1. Alberto Leon Garcia, “Probability And Random Processes For Electrical Engineering”, second edition Low price edition Pearson education.
2. Miller, “Probability And Random Processes-With Applications to Signal Processing and Communication”, first edition 2007, Elsevier.
3. Papoulis and S. Unnikrishnan Pillai, “Probability, Random Variables and Stochastic Processes," Fourth Edition, McGraw Hill.
4. H. Stark and J. Woods, ``Probability and Random Processes with Applications to Signal Processing,'' Third Edition, Pearson Education.
5. Hwei Hsu, “Probability Random Variable,s Random Process, Schaulm’s Outlines, Tata McGraw Hill, 2004.

Reference Books:

1) T Veerarajan, “Probability, Statistics and Random Processes” , third edition Tata McGraw Hill Education Private Limited

Digital Reference:

- Wikipedia
- Google
- https://www.coursera.org/learn/digital

sd	sd	sd
(Mr.Manoj S. Chavan)	**(Dr. Vinitkumar Dongre)**	**(Dr. R. R. Sedamkar)**
Name & Signature of Faculty	Signature of HOD	Signature of Principal /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.