

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY
DESIGN AND MANUFACTURING (IIITDM) KANCHEEPURAM

INTRODUCTION OF NEW COURSE

Course Title	Reliability Theory	Course No (to be assigned by Academic Cell)	MAT6XXX			
Specialization	Mathematics & Statistics, Reliability Engineering	Structure (LTPC)	3	0	0	3
To be offered for	PG and PhD	Status	Core <input type="checkbox"/>		Elective <input checked="" type="checkbox"/>	
Faculty Proposing the course	Dr. Nil Kamal Hazra	Type	New <input checked="" type="checkbox"/>		Modification <input type="checkbox"/>	
Date of DAC	16/10/2018	Members Present	All Faculty Members of the Dept.			
Pre-requisite	Basic Probability & Statistics, Real Analysis, Calculus	Submitted for approval	38th Senate			
Learning Objectives	<ul style="list-style-type: none"> • To gain the basic knowledge of the reliability theory • The reliability study of complex systems • The study of some lifetime distributions and their usefulness • Introduction of some useful ageing classes • A detailed study of different univariate stochastic orders 					
Learning Outcomes	The outcome of the proposed course is two-fold: on one hand, the students will gain some basic knowledge of the reliability theory, and on the other hand, they will learn different methods/tools/techniques (of the reliability theory) that are useful in different branches of science and engineering.					
Contents of the course (With approximate break up of hours)	<p>This course basically covers the following modules:</p> <p>Module 1: Importance of the reliability theory, structural properties of coherent systems, reliability of coherent systems, different useful reliability measures. (15 hours)</p> <p>Module 2: Study of some important lifetime distributions: Exponential, Weibull, Gamma, etc. Study of some semiparametric families of distributions: Location-Scale family, Proportional hazard and reversed hazard families, Proportional odds family, etc. (8 hours)</p> <p>Module 3: The study of some important ageing classes: IFR, IFRA, NBU, NBUC, NBUE, s-IFR, s-IFRA, etc. (7 hours)</p> <p>Module 4: The detailed study of some univariates stochastic orders: usual stochastic order, hazard rate order, reversed hazard rate order, s-ST order, stochastic precedence order, etc. (10 hours)</p>					
Text Books	<ol style="list-style-type: none"> 1. Barlow, R.E. and Prochan, F. (1975). <i>Statistical Theory of Reliability and Life Testing</i>. Holt, Rinehart and Winston, Inc., New York. 2. Shaked, M. and Shanthikumar, J.G. (2007). <i>Stochastic Orders</i>. Springer, New York 					
Reference Books	<ol style="list-style-type: none"> 1. Marshall, A.W. and Olkin, I. (2007). <i>Life Distributions</i>. Springer, New York. 2. Lai, C.D. and Xie, M. (2006). <i>Stochastic Ageing and Dependence for Reliability</i>. Springer, New York. 					