

Session wise course duration and Areas to be covered in each topic			
Serial No.	Topic/Session	Theory /Practical (hr)	Areas to be covered
1	Session 1: NR Latex		
1.1	Latex composition and preservation	1	NR Latex-Definition-composition - cultivation & harvesting- preservation – types of preservation
1.2	Latex concentration methods	1	Concentration – properties - advantages – methods - evaporation-creaming- centrifuging - electrodecantation
1.3	Ball milling & Compounding	1	Dispersion - emulsion – ball milling - calculation – checking – compounding ingredients – compounding – curing methods (Autoclave, oven, water bath)
1.4	Applications of latex	1	Dipped product (Balloons ,condoms, gloves) – Sprayed (carpet backing)- Latex foams (bed) – threads (elastic)
2	Session 2: Natural & synthetic rubber		
2.1	Natural rubber production	1	Marketable forms of NR- RSS – ISNR – EBC – PLC – Scrap (cup lumps, earth scrap, bark lace etc.)
2.2	Introduction to synthetic rubber	1	General purpose SR – special purpose SR- specialty purpose SR -
2.3	Compounding & ingredients	1	Description – properties – purpose of ingredients – mastication- mixing sequence- master batch – final batch
2.4	Types of Mixing machinery	1	Friction ratio – advantages of each machinery – time & temperature – safety & cooling system- open roll mill- inter mix – banbury – kneader- brabender
2.5	Moulding techniques	1	Moulding concept – calendaring – extrusion- vulcanization - time ,temperature & pressure – compression moulding – transfer moulding

2.6	Applications of dry rubber	1	Tyre – Automobile parts – electrical parts - wash & O rings – foot wear – medical filed – hose etc.
3	Session 3: Quality		
3.1	Quality concept and importance	1	Concept – advantages – quality in managerial level- raw material quality – quality of finished goods
3.2	Testing methods and standards	1	Importance of testing – national & international standards – types of standards- benefits of standardization- specifications – repeatability – accuracy -
3.3	Quantitative and qualitative analysis	1	Quantity - definition – units – formulas Quality – definition – visual inspection (RSS)
3.4	Raw rubber testing - standards & methods	1	ISNR – Ash , Dirt , PO & PRI, Volatile, Mooney viscosity Latex – Ammonia , DRC , TSC , NRC, MST, VFA, pH, Viscosity, KOH number
3.5	Testing of products - standards & methods	1	Cure properties - Abrasion – Hardness- Specific gravity – Tensile properties – Tear properties
3.6	evaluation	1	Based on Day 1 & 2 session
4	Session 4 : Industrial visit and practical		
4.1	Safe material handling in laboratory	1	Importance – safety measures & equipments (glove, mask, tongs etc)
4.2	Factory visit	1	Latex/ Dry rubber based industry
4.3	Practical - latex testing	2	DRC , TSC , NRC, MST, VFA, pH, Viscosity, KOH number
4.4	Practical	1	Dispersion, Ball milling and latex compounding
4.5	Interaction with students	1	Review – suggestions
5	Session 5 : Industrial visit and practical		
5.1	Safe material handling in rubber industry	1	
5.2	Factory visit	1	Latex/ Dry rubber based industry

5.3	Practical -	2	Familiarization of compounding ingredients & mixing mill - Rubber compounding - Test sample preparation
5.4	Practical - Raw rubber and final product testing	1	ISNR – Ash , Dirt , PO & PRI, Volatile, Mooney viscosity Cure properties - Abrasion – Hardness- Specific gravity – Tensile properties – Tear properties
5.5	Closing and certificate awarding ceremony	1	Opinion from students - Cultural Programmes of students
		30 Hrs	