



Department of Chemical Engineering		LP: CH18024 Rev. No: 01
B.Tech:Chemical Engineering PG Specialisation : N/A Sub. Code / Sub. Name : CH18024/ Pulp and Paper Technology Unit : I	Regulation:2018	Date: 27.12.2023

**Unit Syllabus: Introduction**

Importance of paper industry, historical background of paper making, development of paper industry in India, Importance of paper, definitions of pulp, paper, and paperboard

**Objective:**

To impart knowledge of Pulp and Paper and its definitions, Importance of paper.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Importance of paper industry	1-Ch.1: Pg.3-13	PPT, Black board
2	Historical background of paper making	1 - Ch. 1: Pg.13- 25	PPT, Black board
3	Development of paper industry in India	1 - Ch. 1: Pg.25 - 33	PPT, Black board
4	Importance of paper and its applications	1 - Ch. 1: Pg.61 - 75	PPT, Black board
5	Definitions of pulp and Pulping Methods for Nonwood Fibers	1 - Ch. 3: Pg.135 - 239	PPT, Black board
6	Global Pulp and Paper Industry	1 - Ch. 1: Pg.61 - 75	PPT, Black board
7	Definitions of paperboard and Considerations for Nonwood* Fiber Use	1 - Ch. 1: Pg. 62-68	PPT, Black board
8	Wood Chip Preparation and Handling at the Pulp Mill	1 - Ch. 2: Pg.91- 125	PPT, Black board
9	Historical review and videos	1 - Ch. 1: Pg.3 - 75	PPT, Black board
Content beyond syllabus covered (if any): Manufacture of sugar from sugar beet			

\* Session duration: 50 minutes



Sub. Code / Sub. Name: CH18024/ Pulp and Paper Technology

Unit :II

**Unit Syllabus : Raw materials and their preparation**

Classification of fibres, characteristics and composition of some important vegetable fibers (hard woods, softwoods, bagasse, straws, rags and paper stock), Wood preparation – pulp wood measurement, barking, chipping, screening and conveying of chips)

**Objective:**

To gain knowledge in hard woods, softwoods, bagasse, straws, rags and paper stock

Session No *	Topics to be covered	Ref	Teaching Aids
10	Classification of fibers and Considerations for Nonwood Fiber Use	1 – Ch. 1: Pg.25-33 -	PPT, Black board
11	Characteristics vegetable fibers and Use of Nonwood Plant Fibers	1 – Ch. 1: Pg.37 - 47	PPT, Black board
12	composition of some important vegetable fibers	1 – Ch. 1: Pg.37-39	PPT, Black board
13	Concept of hard woods & soft woods	1 – Ch. 1: Pg.47-61	PPT, Black board
14	Concept of bagasse, straws & Paper Stock	1 – Ch. 1: Pg.47-61	PPT, Black board
15	Wood preparation and Wood Handling	1 – Ch. 2: Pg.91- 108	PPT, Black board
16	Pulp wood measurement and barking	1 – Ch. 2: Pg.109- 125	PPT, Black board
17	Screening and conveying of chips	1 – Ch. 2: Pg.125 - 135	PPT, Black board
18	Review & videos	1 – Ch. 2: Pg.91 - 248	PPT, Black board

Content beyond syllabus covered (if any): Solvent Extraction of Soya Beans

\* Session duration: 50 mins





Sub. Code / Sub. Name: CH18024/ Pulp and Paper Technology

Unit :III

**Unit Syllabus: Pulping processes**

Mechanical pulping, alkaline pulping (Soda and Kraft), sulfite pulping, semi-chemical pulping, recovery of cooking chemicals from spent cooking liquors, Bleaching agents, bleaching methods – single stage and multistage bleaching

**Objective:**

To impart knowledge on Pulping processes bleaching agents and its methods.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Mechanical pulping and General Chemical Pulping Definitions	1 – Ch. 3: Pg.179 - 189	PPT, Black board
20	Alkaline pulping (Soda and Kraft) and Kraft H-Factor and Other Process Control Equation	1 – Ch. 3: Pg.135 - 144	PPT, Black board
21	Sulfite pulping and Sulfite Liquor Analysis	1 – Ch. 3: Pg. 159-179	PPT, Black board
22	Semi-chemical pulping Specific Gravity and Viscosity of Kraft Liquors	1 – Ch. 37: Pg.197 - 208	PPT, Black board
23	Recovery of cooking chemicals from spent cooking liquors	1 – Ch. 3: Pg.239-248	PPT, Black board
24	Bleaching Agents and New Developments	1 – Ch. 4: Pg.249-263	PPT, Black board
25	Industrial Bleaching methods	1 – Ch. 4: Pg.263-274	PPT, Black board
26	Single stage and multistage bleaching	1 – Ch. 4: Pg.275 -305	PPT, Black board
27	Review & Videos	1 – Ch. 3: Pg.139-248	PPT, Black board

Content beyond syllabus covered (if any): Exploration of crude oil.

\* Session duration: 50 mins



Sub. Code / Sub. Name: CH18024/ Pulp and Paper Technology  
Unit :IV

**Unit Syllabus : Manufacture of paper**

Beating and refining, sizing and loading (filling), Paper machines (Fourdrinier and Cylinder), making of paper – forming section, press section, dryer section, calendaring section

**Objective:**

To obtain knowledge on Beating and refining, sizing and loading (filling), Paper machines

Session No *	Topics to be covered	Ref	Teaching Aids
28	Beating and refining	1 – Ch. 5: Pg.325 - 344	PPT, Black board
29	Sizing and loading (filling)	1 – Ch. 5: Pg.344 - 355	PPT, Black board
30	Paper machines and its Classification	1 – Ch. 6: Pg.383 - 400	PPT, Black board
31	Four drinier and Cylinder Machines	1 – Ch. 6: Pg.401 - 418	PPT, Black board
32	Making of paper of industry in India and its process	1 – Ch. 6: Pg.419 - 426	PPT, Black board
33	Forming section and Press section of paper	1 – Ch. 6: Pg.419 - 426	PPT, Black board
34	Dryer section & Packing technology	1 – Ch. 6: Pg.427 - 454	PPT, Black board
35	Different code of paper and its applications	1 – Ch. 7: Pg.517 - 577	PPT, Black board
36	Review & Videos	1 – Ch. 6: Pg.325 - 377	PPT, Black board

Content beyond syllabus covered (if any): Manufacture of Vinyl Rubber

\* Session duration: 50 mins





Sub. Code / Sub. Name: CH18024/ Pulp and Paper Technology  
Unit :V

**Unit Syllabus : Testing of paper**

Testing and evaluation of pulp, various properties of pulp and paper and their testing, Different types and uses of papers and paper boards, composition, method of making different types of papers and boards.

**Objective:**

To impart knowledge Testing and evaluation of pulp, various properties of pulp and paper and their testing.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Testing and evaluation of pulp	1 – Ch. 9: Pg.665-683	PPT, Black board
38	Various properties of pulp	1 – Ch. 9: Pg.657-665	PPT, Black board
39	Different properties of Paper	1 – Ch. 9: Pg.657-665	PPT, Black board
40	Pulp & Paper Testing Technology	1 – Ch. 9: Pg.665-683	PPT, Black board
41	Different types and uses of papers	1 – Ch. 9: Pg.679-684	PPT, Black board
42	Different types and uses of paper boards	1 – Ch. 9: Pg.681-683	PPT, Black board
43	Method of making different types of papers	1 – Ch. 9: Pg.683-684, 686 - 688	PPT, Black board
44	Method of making different types of boards.	1 – Ch. 9: Pg.687, 673- 679	PPT, Black board
45	Review & Videos	1 – Ch. 9: Pg. 657-700	PPT, Black board

Content beyond syllabus covered (if any): Different forms of fibers

\* Session duration: 50 mins



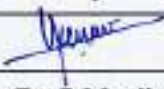
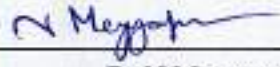
Sub Code / Sub Name: CH18024/ Pulp and Paper Technology

**TEXT BOOKS:**

1. Britt K W, Handbook of Pulp and Paper Technology, Reinhold Publishing Corporation, New York.
2. MacDonald R G, Pulp and Paper Manufacture Vol I to III, Second Edition., McGraw Hill, New York

**REFERENCES:**

1. "Pulp and Paper: Chemistry and Chemical Technology Vol I to IV, Casey JP, Ed., Wiley Interscience, New York
2. Pulp and Paper Manufacture, Kocurek, Tappi Publication. Mark, Handbook of Physical and Mechanical Testing of Paper and Board, Vol.I & II, Dekker Publication
3. Wood Chemistry: Fundamentals and Applications, Second edition by E Sjostrom, Academic Press

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Date	28.12.2023	28.12.2023
Remarks *:		
Remarks *:		

\* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD