Dr.B.P.Pal,
,PhD(Cantab),FLS,FBS,FNI.
DIR/1953/4

CONFIDENTIAL

11th January, 53

My dear Sardar Bahadur,

As already requested by you I am sending herewith a statement showing the Indian Forest Syllabus and an approximate estimation of the portion covered by the syllabus of the Central College of Agriculture. From this it will appear* The Indian Forest College Calendar supplied by you is returned herewith.

*that about 564 hours can be "saved" over the two year period. This comes very close to the period of 593 hours allotted for work in the 1st year (excluding excursions and tours and unspecified field work.).

Yours sincerely,

(B.P.Pal)
DIRECTOR

Sardar Bahadur Sardar Lal Singh, M.P.,
Member, Estimates Committee,
New Delhi.

P.S. A copy of the syllabus of the Central College of Agriculture is also enclosed.

Enclos: As above.

INDIAN FOREST COLLEGE

SYLLABUS

FIRST YEAR	Hours allotted*	Approximate percentage of course covered in Agriculture College syllabus / Hours saved by Agr graduates.
(1.)Silviculture	70	17½
(2) Land Management & Soil Conservation	30	20
(3) Forest Mensuration	50	5
(4) Utilization (General)	30	0
(5) Botany	120	120
(6) Forest Zoology	68	68
(7) Geology	32	8
(8) Soil Science	48	48
(9) Surveying	60	48
(10) Engineering	85	21¼
	593	355½

SECOND YEAR		
(1) Silvicultural Systems	50	0
(2) Silviculture of Indian trees	25	1¼
(3) Forest Management and Working Plans	50	2½
(4) Forest Finance	20	0
(5) Forest Policy	15	0
(6) Forest Protection	22	5½
(7) Botany (Morphology, Histology, Physiology)	100	80
(8) Ecology	20	10
(9) Mycology and Plant Pathology	40	32
(10) Forest Zoology	68	54
(11) Engineering	85	0
(12) Utilization (Technical):- (Minor Forest Products. Sawmilling, Wood Working and Wood Using Industries, Wood Seasoning, Wood APreservation, Composite Wood, Timber Mechanics, Paper and Cellulose Industries, Wood Technology).	119	3
(13) Statistics.	22	20
	636	208¼
Grand Total ...	1229 ...	564

*(excluding excursions, tours and unspecified field work.)

If the two years are taken together, 564 hours are saved compared to the requirement of 593 hours for the first year course. This excludes excursions etc.

Approximate percen--tage of course covered in Agricul--ture College syllabus

Indian Forest College Syllabus

F O R E S T R Y

SILVICULTURE
(1st Year)

NATURAL HISTORY OF THE FOREST

70 hours class room lectures. 70%

1. Introduction.-

(i) General features of the vegetation of the earth; forest, scrub, grass lands and desert.
(ii) Early History of Indian Forestry
(iii) Factors bearing on the present extent and condition of forests in India.

2. Factors influencing the nature and composition of forests -

(i) Climate -
- (a) Definition. Factors upon which climates depend, and local conditions which may modify them.
- (b) Action and reaction between climate and forests.
- (c) Classification of forest climates in India
- (d) Influence of forests on locality

(ii) Soil -
- (a) Origin and composition.
- (b) Chemical and physical qualities.
- (c) Classification of soils.
- (d) Action and reaction between soil and forest
- (e) Soil flora and fauna including mycorrhiza, nitrification, etc.

(iii) Topography -
- (a) Influence on vegetation.
- (b) Microclimate.

(iv) Biotic -

(a) Animals. (b) Man. (c) Past history.

COMPOSITION OF FOREST

3. Trees -

(i) Form, growth and reproduction, inheritance of characters and phenology.
(ii) Requirements with regard to light, moisture, temperature and soil.
(iii) The common Indian Trees

4. Forest crops -

(i) The natural and artificial forest.
(ii) The growth and development of forest stands
(iii) The struggle for existence in forests.
(iv) Pure and mixed crops.
(v) Principal Indian Forest Types.

5. Natural regeneration - Seed, Coppice and root-suckers

6. Artificial regeneration -

(i) Seed col ection, storage and treatment
(ii) Choice of species.
(iii) Direct sowing, nurseries and planting.
(iv) Taungya plantations.

7. Afforestation and reclamation -

(i) Planting of mountain slopes for their protec--tion and the regulation of torrents.
(ii) Re-stocking of blanks and waste lands.
(iii) Fixation of moving sands.
(iv) Afforestation of vravine lands
(v) Afforestation of arid areas.
(vi) Irrigated plantations.
(vii) Afforestation of swampy areas including drainage

TENDING OF FOREST CROPS.

8. Tending pure even-aged, mixed even-aged and irregular crops -
(1) weeding including soil working,
(2) cleaning
(3) thinning,
(4) climber cutting, and
(5) pruning.

LAND MANAGEMENT AND SOIL CONSERVATION
(First Year)

30 hours class room lectures and a 10 days tour for Land Management. 75%

Scope - Historical review of misuse of land - Defini--tion. Erosion - Its causes, effect and extent in India. Land problems in India; agricultural lands, grassing and livestock. Reclamation measures - passive and active. In hilly catchment areas, sloping cultivation, specification, contouring and terracing. Torrent training works, Programme of Soil Conservation

Management of Agricultural la nds.

Farm Forestry - General policy, shelder belts and wind breaks.

Regulation and improvement of grazing.

MENSURATION
(First Year)

50 hours class room lectures, Practical work on First Hill Tour. 10%

Theory of trees measurement, Diam., height and bark thickness measurement.

Measurement of felled trees including measurement of stem wood, branch wood, root wood and crowns, measure of outturn of charcoal.

Statistical methods utilisad in mensuration - Curve Construction and graphic representation (Actual methods to be dealt with in Statistics).

Form of trees and taper tables - methods of studying tree form.

General formation for tree stem form.

Estimation of volume of standing trees - Volume tables their kind and scope. Compilation. Determination

of age of Trees, their increment in hgi height, diam. and volume. Enumeration of growing stock. Measurement of a forest crop including increment. Sample plots - selection lay-out and measurement according to Statistical codes. Yield Tables - Preparation and use; Stand tables, their application

U T I L I S A T I O N
(GENERAL)
(1st Year)

30 hours class room lectures. 0%

1. Definition and scope.
2. Types of Forests in India; difficulties in extraction of timber.
3. Implements used in felling extraction.
4. Season of felling and extraction.
5. Felling - various methods practised in India; their advantages, disadvantages; Limitations.
6. Conversion of timber and Firewood.
7. Extraction and transport - different methods practised, their advantages and disadvantages; Limitation.
8. Sale - various systems; advantages and disadvantages.
9. Timber depots - Size; organisation and management
10. Timber of India - description of important timber; suitability of Indian wood for various purposes; Utilisation in India.

BOTANY
(1st Year)

60 hours class room lectures and an equal number of hours laboratory work and study on tours. 100%

The general principles of -

(A) Morphology and Histology.
(B) Physiology.
(C) Systematic.

A$MORPHOLOGY AND HISTOLOGY

External Morphology -

(i) The Seed, Four types (Dicotyledon with and without endosperm, Monocotyledon and Gymnosperm). Development and structure of seed. Food supply in the seed and its nature. Phenomena of germination and growth of embryo into seedlings a seedling. Dispersal of seed.

(ii) The Shoot, General characters and forms. Buds. Various types and forms of leaves, simple and compound. Phyllotaxy. Venation, etc. Systems of branching. Specialised and metamorphosed shoots.

(iii) The Root. General characters and forms. Position and origin of secondary roots. Specialised and metamorphosed roots.

(iv) Inflorescence, Flower and Fruit.

Histology -

(i) The cell. Unicellular and multicullar organism.
  (a) Structure of the Cell.
  (b) Protoplasm
  (c) Cell-contents.
  (d) Ontogeny of the Cell.
  (e) Cell in process of reproduction.

(ii) Cell fusions.
(iii) Tissues and Tissue systems.

(iV) Internal structure and development of plant members; deviations from normal development.

B.PHYSIOLOGY

General.

Osmosis, Absorption and Transpiration.
Chemical composition and food of plants.
Metabolism.
Growth.
Movement
Reproduction.

PRACTICAL WORK

Morphology-
Dissection, sketching and description of - seeds, leaves, stems, inflorescence, flowers and fruits.
Histology -
Examination of permanent slides of -
(1) Vegetable cell and its contents
(2) Internal structu e of stem and root of all the three types, leaf and stomata.
(3) Secondary growth in the stem and root of Dicots and Gymnosperms.

Botanical collections, identifications of plants and use of floras in the field.

BOTANICAL COLLECTIONS

During each tour every student will collect complete botanical specimens of not less than 25 plants and submit them properly dried, mounted and labelled.

Z O O L O G Y
(1st Year)

34 hours class room lectures and 34 hours laboratory work 100%

1. General characters and classification of the Animal Kingdom.
2. Protozoa, Connection with diseases.
3. Metazoa. Arthropoda, general characters and classi-fication. Crustacea, Arachnida, Myriapoda, Insects.

4. Vertebrates. Classification of birds, mammals,etc. Their general characters and economic importance in forestry.

5. Insecta. External Morphology. Detailed anatomy of a type. (Periplaneta orientalis). General account of the development and metamorphosis of insects. Forms, structure, habits of larvae, pupae, and imagines. Classification. Discussion and summary of the orders. Principles on which the orders are subdivided systematic position of families of economic importance.

6. Field work and methods of observation. Collection, preservation and transport of specimens.

G E O L O G Y
(1st Year)

16 hours class room lectures, 16 hours work in Laboratory 25%

Introductory. Definition and scope.

Mineralogy Minerals.
Classification of minerals
Essential minerals.

Accessory minerals.
Metalliferous or ore-forming minerals
Economic minerals.

Petrology. - Rocks
Igneous rocks.
Sedimentary rocks.
Metamorphic rocks.

Structural Geology -
Strike, Dip.folding anticlines and synolines, faults, geological maps and sections.

Dynamic Geology -
Subterranean agencies ;-
Volcanoes, earthquakes, Crustal move--ments, Subaerial agencies; aqueous - underground water, wells and springs, surface water; atmospheric - Sanddunes; organic; Chemical.

Rock disintegration and Soil formation

HistoricalGeology -
Fossils, classification of the earth's history - main forms of life in different ages.

Geology of India.

PRACTICAL WORK

General examination of mineral and rock specimens.
Study of wooden models illustrating forms of crystalli--sation.
Study of physical characteristics in type minerals specimens.
Study - hand specimens of Quartz and its varieties felspars; micas. Pyroxenes, amphiboles, olivine, secondary and accessory minerals - Ore forming minerals, economic minerals.

Examination of Rocks - illustrations of types and Textures.

Study - hand specimens of Granites, Syenites, Gabbros, obsidian and basalt - Sandstones, Limestones, shales , and conglomerates - Slates, quartzites, marble, schist's and gneisses.

General examination of fossils.

SOIL SCIENCE
(1st Year)

16 hours class room lectures, 32 hours work in Laboratory and 1 week's field work. 100%

Relationship of plants to Soil and atmosphere. Soil formation processes. Soil Classification. Soil profiles - horizon; development of soils in different climates. Laterisation; podsolization. Texture of soils Mechanical analysis of soils andmethods of dispersion. Clay fraction and its function. Influence of soil texture on presence andregeneration of species. Chemical nature of soil.

Physical properties of Soil.Soil organic matter. Soil Nitrogen with special reference to Indian Forest condition. Soil nitrates. Soil colloids - formation and function. Absorbtive power of soil. Soil water. Soil air. Soil temperature. Soil description.

PRACTICAL WORK

Mechanical analysis of soil. Moisture and Loss on Ignition. Experiments with humus. Estimation of to al nitrogen. Absorbtive power of soil. Determi--nation of lime requirement of soil by Hutchinson and Mc Lennan's method. Qualitative tests for sourness of soils. Estimation of exchangeable calcium and magnesium in soil. Determination of moisture equivalent of soil by Bouyouco's method. Moisture content of saturated soil. Det rmination of pore space in soil. Determiation of Ph of soil and exchangeable acidity. Est mation of organic matters in soil. Scientific methods of noting soil profile and site characteristics in the field.

SURVEYING
(1st Year)

35 hours class room lectures and 25 hours in the field. 80%

A. Lecture Room Course -

1. Construction of scales, simple, and diagonal.
2. Conventional signs used in survey, plans and sections.
3. Colouring and printing.
4. Method of entering topographical details, hills shading and contour lines.
5. Reducing, copying and enlarging plans by pahto--graph, method of squares, and with proportional compasses.
6. Calculation of areas by triangles, coordinates, acre-comb and planimeter.
7. Chain surveying; maintenance and form of field book
8. Survey with prismatic compass and chain, field--book, plotting.
9. Plane-table survey.
10. Levelling form of field-books, computation for the reduction of the base line.
11. Plotting and colouring surveys and level sections

B. Field work course -

1. Chain surveying -
   A small extent of country to be surveyed and all interior details to be filled in with the chain and off-set rod only.
2. Compass and chain survey -
   A small survey or road traverse to be made with chain and prismatic compass. Adjustment of pris--matic compass.
3. Plane table survey -
   A small extent of country to be surveyed and interior details to be filled in with plane tables.
4. Levelling -
   Practical use of level. Leven sections to be taken between fixed points.
5. Contouring.
6. Use of maps in the field.

E N G I N E E R I N G
(1st Y ear)

35 hours class room lectures and 50 Engineering Drawing hours. 25%

Stone, Bricks, and Surkhi, Tiles, Lime and Cement, Sand and Mortars, Cement concrete, Plaster and

Painting, Stone masonry, Brick masonry, Lintels and arches, Foundations, Joints, Floors, Roofs, Stairs and Stair cases, Doors and Windows, Elementary Strength of Materials.

F O R E S T R Y

SILVICULTURE SYSTEMS
(2nd Year).

50 hours class room lectures and study on tours. 0%

Definition, Fundamental requirements and con--ditions necessary for introduction.

Classification - distinguishing characters of each system. Choice of system; conversion and evolution.

A detailed st dy of the Indian and European Standard Silvicultural systems will be made and their application in practice in the various types of forests in Europe, India and America will be studied.

SILVICULTURE OF INDIAN TREES
(2nd year)

25 hours class room lectures and study on tours. 5%

1. Detailed information as available uptodate will be given under utility, distribution, climatic and soil requirements, Types of forest in which found, phenology, Silvicultural characters, natural and artificial regeneration and the Silvicultural system of working.

2. General tre tment of ever-green species.

3. General account of species suitable for roadside avenue, canal bank plantation and dry and arid areas

FOREST MANAGEMENT & WORKING PLANS
(2nd Year)

50 hours class room lectures and 6 weeks' field work. 5%

MANAGEMENT

Forms of Management.
The principle of sustained yield.
Normal forest. Growing stock. Age class, distribution, normal proportion; distribution in regular and irregular forests. Felling series; felling series under various systems. Cutting sections.
Increment in crops; effect of thinning and climate.
Rotation - Kinds, Choice; factors effecting length. Felling Cycles; Conversion period.
Relationship between growing stock, increment and yield. Yield regulation and calculation - Area and Volume regulation. Chief basis for the determination of yield. Grouping of systems for yield regulation. Regulation under clear felling system. Regulation under Regular shelterwood system.
On division of areas; on Vol. and on increment of the whole growing stock. formula methods; Hufnagl's method.
Regulation under irregular shelterwood system - methods based on growing stock, on increment and growing stock.

WORKING PLANS

Definition, Scope, Sphere, Necessity, Division of forests, unit of management. Working circles, felling series, compartment, subcompartment maps. Working plan

and special maps. Forest Map Office and facilities. Preliminary working plan report - Scope and necessityl Data to be collected. Notes to be taken.

A full scale working plan in any suitable sal forest covering as many types as possible will be undertaken towards the end of the course. Each studemt will write a full working plan for not less than 5000 acres. The students will be encouraged to study as many working plans as possible particularly of their main species of their own State, and special areas and forest under the management of forest Departments, such as roadside avenues, canal bank plantations, bamboo and forests managed for lac and extraction of gum, resins and latex, etc.

FOREST FINANCE
(2nd Year)

20 hours class room lectures. 0%

Formulae used in forest valuation. Estimates of expenses and receipts. Methods of calculation of the value of forests. Methods of estimating the Financial results of Forestry for intermittent working, sustained yield work. Financial Rotation, methods of determining financial rotation and its application in practice. Assessment of damage to wood, soil or a whole forest. Choice of methods of utilising land. Application of financial test to forest management.

FORESTY POLICY
(2nd Year)

15 hours lectures in class room. 0%

Foundation of stable forest policy, Constitution and Status; Effect on Management; General principles of Forest Policy; Indian Forest Policy, U.S.A. Forest Policy; Control measures in different countries.

FOREST PROTECTION
(2nd Year)

With the 22 hours class room lectures aided by demonstration in the field. 25%

Agencies of damage and methods of protection.

Man - Form of damage - Fires - causes. Beneficial and injurious effects of fire. Protection from fire-preventive and protective measures. Post fire operation.

Animals - Damage caused. Preventive and protective measures. Rotational and Controlled Grazing. Fencing.

Plants - Damage caused by and protection against weeds, climbers, opidhytes, and parasites.

Injurious climatic factors - Low temperatures, Heat, Drought, Snow, Wind and Storm.

B. OTHER SUBJECTS

B O T A N Y
(2nd Year)

50 hours class room lectures and an equal number of hours of laboratory work and study on tours. 80%

SYSTEMATIC BOTANY

Heredity and evolution.
Classification of plants.
Indication of upward genetic development.
Forms of degeneracy.

Systematic Botany of Indian Plants, following Bentham and Hooker's system.

Dicotyledons:

1. Magnoliaceae
2. Dilleniaceae
3. Bixaceae
4. Guttifereae
5. Dipterocarpaceae
6. Malvaceae
7. Sterculiaceae
8. Tiliaceae
9. Rutaceae
10. Simarubaceae
11. Burseraceae
12. Meliaceae
13. Rhamnaceae
14. Sapindaceae.
15. Anacardiaceae
16. Leguminoseae
17. Rosaceae
18. Rhizophoraceae
19. Combretaceae
20. Myrtaceae
21. Lythraceae
22. Rubiaceae
23. Ericaceae
24. Sapotaceae
25. Ebenaceae
26. Oleaceae
27. Apocynaceae
28. Asclepiadaceae.
29. Loganiaceae
30. Pynomaceae
31. Verbenaceae
32. Labiateae
33. Piperaceae
34. Lauraceae
35. Santalaceae
36. Euphorbiaceae
37. Urticeaseae
38. Casuarinaceae
39. Cupulifereae

Gymnosperms

40. Gnetaceae
41. Conifereae
42. Cycadaceae

Monocotyledons

43. Orchidaceae
44. Scitanineae
45. Iridaceae
46. Amarillidaceae
47. Liliaceae
48. Palmaceae
49. Pandanaceae
50. Typhaceae
51. Cyperaceae
52. Gramineae.

PRACTICAL

Dissection, sketching, description and identification (with flora) of various families of flowering plants, including grasses.

BOTANICAL COLLECTIONS

During each tour each student will collect complete botanical specimens of not less than 25 plants and submit them properly dried, mounted and labelled.

FOREST ECOLOGY
(2nd Year)

20 hours class room lectures and 2 excursions. 50%

Introduction - Definition, Scope, Aim and importance in Forestry. Static and Dynamic view points. Antecology, Synecology, Genecology

Origin, succession and Development of vegetation -

Colonization:
Migration: ecesis; aggregation; and competition, Succession; Causes of succession; stage, phase and seres Progressive and Retrogressive, Primary and secondary succession. Climax; climax complex; Post and pre-climaxes.

Plants and Environment
(Relationship between soil development and vegetation, reaction of vegetation on factors of locality and influence of factors of locality on vegetation will be only very briefly referred to.)

Structure of vegetation

Formation; association; society; zonation, associes, consocies, etc., Plant Community as a unit of study = Character of a Community, viz. Dominance; Layers (or stratification); Aspects.

Methods of studying vegetation -

Importance of object in view: Preliminary survey and stock. Mapping. Detailed examination

Quadrats. - Kinds of quadrats - List, Count and basal area quadrats; chart quadrats; frequency - abundance quadrats; permanent quadrats; Size and numbers of quadrats to employ in Forest studies

Transect - Belt transect; making a transect.

Profile Charts - Stratum transect, Bisect; Root distribution. Technique of charting vegetation. Methods of charting. Use of vegetation charts.

Method of expression of vegetation data -

Mapping, Histogram; Polygraph, Phytograph, Frequency Diagram.

Field work -

Count Quadrats; Belt transect.

1. Determination of Frequency, Frequency index and Frequency index coefficients.
2. Determination of the Composition of a mixed crop
3. Description of the site and vegetation in the standard form.

MYCOLOGY AND FOREST PATHOLOGY
(2nd Year)

20 hours lectures and an equal number of hours of work in the laboratory 80%

Position of the Fungi in the vegetable kingdom
Description of the vegetative structures.
Reproduction of the fungi.
Reproductive structures.
Type of spores.
The dissemination of spores.
The classification of fungi.
The physiology of the fungi.
Life history of the parasitic fungi.
The causation of disease by fungi.
Systematic study of fungus parasites with special reference to woody plants.
Phycomycetes - Peronosporaceae.
Ascomycetes - Erysiphaceae.
Pyrenomycetes.
Nectriaceae.
Discomycetes.
Basidiomycetes - Ustilaginaceae.
Uredineae - Fam.Pucciniaceae.
Fam.Coleosporium campanulae
(Peridermium Orientale)
Coleosporium barclayense
nov.sp. = Peridermium brevius.
Fam.Cronartiaceae.
Fam.Chrysomyxaceae.
Fam.Agaricineae.
Fam.Polyporaceae.
Principles of control of plant diseases.

ZOOLOGY (2nd Year) 80%

34 hours class room lectures and 34 hours laboratory work

1. Bionomics of insects. General relationship of insects and plants, interrelation of insects, predators, parasites, inquilines, etc.

2. General characters and life histories of economically important forest insects belonging to the following orders :-

Orthoptra, Lepidoptra, Hemipptra, Hymenoptra, Diptra, Isoptra. General characters and economic importance only of Thysaora, Collambola, Thysanptra; Anoplanoa, Mallo--ptaga, Odonata and Neuroptra.

3. Ecological classification of injurious and beneficial forest insects.

4. Insect pests and epidemics and their origins, principles of pest control in forests.

The students will collect and submit 50 insects properly labelled and with their life history.

E N G I N E E R I N G (2nd Year) 0%

35 lectures room hours and 50 Engineering Drawing hours

Assembly, Fire Places and Chimneys, Reinforced concrete (Elementary), Retaining walls and breast walls, Forest types, Alignment, Construction, Estimate of (1) Building (2) Road (3) Bridge, Preliminaries, Simple wooden Bridges, Cantilever Bridges, simple wire rope bridge. Water supply - wells and springs. Field Engineering - Hauling methods. Extraction methods.

UTILISATION (TECHNICAL)

FOREST PRODUCTS OTHER THAN TIMBER (Second Year)

30 hours class room lectures. 10%

General - Importance of Minor Forest Products to Indian Trade and industries and the Indian villages.

Fibres and flosses - species of economic importance and their uses.

Gums, resins, Olio-resins and Gum-olio-resins. Collection marketing and uses of the more important species. Turpentine industry in India.

Essential oils - From grasses. From other than grasses.

Oil seeds - of forest importance.

Tanning materials - from bark, ~~kemmves~~ leaves, fruits and wood

Vegetable dyes. Drugs and species. Poisonous plants. Lac and lac products. Wood distillation. Charcoal making. Producer gas for automobiles. Cutch and Katha. Stockholm tar and chir tar. Biri (bidi) leaves. Rubber, gutta percha and chewing gum. Bamboos, canes. Honey and wax. Fodder grasses, grazing, hay and silage making, Insecticides of vegetable origin. Match Industry. Edible products.

SAWMILLING, WOOD WORKING AND WOOD USING INDUSTRIES

(2nd year)

15 hours class room lectures. 0%

1. Sawmilling.
   a. Various types of saw machines, their operation and characteristics.
   b. Saw sharpening, setting, tensioning, etc.
   c. Design and layout of a portable sawmill unit.

2. Wood Working.
   a. Hand tools and their uses.
   b. Machine tools and their operation.
   c. Various types of joints.

3. Wood using industries
   a. Working properties of common commercial timbers
   b. Timbers suitable for various industries :-
      i. Building and constructional work
      ii. Agricultural implements, Tool handles and carts
      iii. Furniture and cabinet work.
      iv. Ship and Boat-building.
      v. Sports goods.

WOOD SEASONING

(2nd Year)

10 hours of class room lectures and demonstration 0%

Seasoning, its definition and advantages. Determination of moisture in wood. Shrinkages. Methods of storage. Methods of stacking. Defect in wood. Kiln drying. Behaviour of seasoned timber in use.

WOOD PRESERVATION

(2nd Year)

8 hours of class room lectures & demonstration 0%

1. Scope of the subject.
2. Agencies of wood deterioration.
3. Natural durability.
4. Wood preservatives, types; composition and properties.
5. Testing of wood preservatives; preparation of material for treatment including conditionof green timber.
6. Treating processes - brush treatment; steeping; open tank process; pressure processes; -Osmose process; Boucherie process; charring.
7. Handling of timber subsequent to treatment.
8. Cost of treatment and economic importance of wood preservation.
9. Protection of wood by methods other than standard presercative treatment.
10. Sap stain and its prevention.
11. Protection against fire - natural resistance to fire and fire retardent compositions and the mechanism of their action.

COMPOSITE WOOD

(2nd Year)

8 hours class room lectures and demonstration. 0%

1. Defects in natural wood.
2. Compressed wood - production and properties.
3. Impregnation of wood with resin forming chemicals; properties and uses of resin impregnated wood.
4. Adhesives; Protein Adhesives; starch adhesive; resin-adhesives; application of adhesives.
5. Production of veneer.
6. Laminated wood including ply-wood; advantages; properties; production and uses.
7. Compregnated wood production, properties and uses.

TIMBER MECHANICS
(2nd Year)

10 hours class room lectures. 0%

1. Definition and scope - General review of the Timber Testing work.
2. Tests for timber in bending.
3. Tests for timber in compression.
4. Working out results from test observation.
5. Tests for timber in impact, shear and Hardness.
6. Tests for nail holding power and packing cases.
7. Computation of test results.
8. Explanation of strength tables. Effect of seasoning on Strength.
9. Factors affecting the strength of timber and grading; factors of safety; safe working stresses.
10. Comparative suitability figures and how to use them.
11. Dewel joints for timber structures and their usefulness.

PAPER AND CELLULOSE INDUSTRIES
(2nd Year)

8 hours class room lectures and demonstration. 0%

1. Classification of fibrous raw materials.
2. Structural characteristics of fibres of the important paper making materials viz. bamboo, Sabaigrass, woods, etc.
3. Essential requirements for a raw material to be suitable for pulp and paper manufacture.
4. Distribution and supplies of the principal pulp and paper making materialsin the various Provinces. Flowering of bamboos and its effect on the supply of the raw material to a pulp and paper mill. Plantations of bamboos, grasses, and woods for the pulp and paper industry.
5. Chemical pulp or cellulose and mechanical pulp - Principal processes employed in their manufacture.
6. Paper and boards - in brief description of processes of manufacturing.
7. Cost of production - Principal items entering into the cost of production of pulp and paper; analysis of total cost of production per ton.
8. Consumption of paper and boards in India. Total quantity required; Production in India. Imports.
9. Location - present and future location of pulp and paper mills.

WOOD TECHNOLOGY
(2nd Year)

30 hours of class room and laboratory work. 0%

The gross structure of wood. The minute structure of wood. The general features of wood. Figures, Knots, and Pitch flocks. Practical work will consist of the identification of 40 common Indian Timbers with a hand lens, anatomical study of three main types and the study of com-mon defects.

STATISTICS
(2nd Year)

22 hours class room lectures. 90%

1. Averages: Arithmetic mean, Median and Mode.
2. Measures of Dispersion: Range, Quartile deviation, mean deviation and standard deviation.
3. Frequency Distribution; Normal and Binomial distributions.
4. Probability: Basic ideas of the theory of probability and simple applications.
5. Tests of Significance: Chi-square test of goodness of fit; and of independence in contingency tables*
6. Correlation (two variables). Correlation coefficient,

~~xxxxxxxxxx~~
Correlation ratio, rank correlation, non-linear regression, Method of least squares.

7. Analysis of variance; Test of significance of correlation coefficient and correlation ratio and their differences. Test of Significance of the differ--ence between several means.
8. Experimental design; Replication, randomization, local control, Randomized block and Latin square designs.
9. Techniques of sample surveys in forestry.

* Test of significance of a single mean and difference between two means (large samples and small samples).

R. P. B. Ld.

Russell

I am sending back the syllabus after marking the percentages in pencil.

For topics 1 to 3, I have written out the whole thing & this might be typed as such.

Pl. see me at 9.15 as I am having at 9.30 hr a meeting.

Bertrand Russell
12.1.53.

Indian Forest College
Syllabus

approximate
percentage of
course covered
in Agric. College
syllabus

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cover letter

For pages 1–3

First year

	Hours allotted (excl. excursions & tours of field unspecified work)	Hours saved (by agric. graduates)
(1) Silviculture	70	17½
(2) Land Management & Soil Conservation	30	20
(3) Forest Mensuration	50	5
(4) Utilization (General)	30	0
(5) Botany	120	120
(6). Zoology	68	68
(7) Geology	32	8
(8) Soil Science	48	48
(9) Surveying	60	48
(10) Engineering	85	21¼
	593	355¾

Second year

	Hours allotted	Hours saved
(1) Silvicultural Systems	50	0
(2) Silviculture of Indian trees	25	1¼
(3) Forest Management & Working plans	50	2½
(4) Forest Finance	20	0
(5) " Policy	15	0
(6) " Protection	22	5½
(7) Botany	100	80
(8) Ecology	20	10
(9) Myc. & Pl. Pathology	40	32
(10) Forest Zoology	68	54
(11) Engineering	85	0
(12) Utilisation (Technical)	30 + 15 + 10 + 8 + 8 + 10 + 8 + 30 = 119	3
(13) Statistics	22	20
	636	208¼

Grand total	1229	564

593 + 636 = 1229 ÷ 2 = 614

355¾ + 208¼ = 564

If the two years are taken together, 564 hours are saved compared to the requirement of 593 hours for the first year course. This excludes excursions etc.