MODEL SYLLABUS

FOR TRAINING OF FRONTLINE STAFF- HIMACHAL PRADESH

(CAPACITY DEVELOPMENT FOR FOREST MANAGEMENT AND TRAINING OF FRONT LINE PERSONNEL)






August, 2018

SUBMITTED TO

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1. ADOPTION OF MODEL SYLLABUS WITH STATE SPECIFIC CHANGES-HP

1.1 Understanding Syllabus

A syllabus usually contains specific information about the course, such as information on how, where and when to contact the lecturer and teaching assistants; an outline of what will be covered in the course; a schedule of test dates and the due dates for assignments; the grading policy for the course; specific classroom rules; etc.

The syllabus serves many purposes for the students, trainees and the teacher, trainer such as ensuring a fair and impartial understanding between them such that there is minimal confusion on policies relating to the course, setting clear expectations of material to be learned, behavior in the classroom, and effort on student's/trainer's behalf to be put into the course, providing a roadmap of course organization/direction relaying the instructor's/trainer's teaching/training philosophy to the students/trainees, and providing a specific angle of the course such that students/trainees may choose early in the course whether the subject material is attractive. The meaning of Syllabus will be clearer from the following definitions.

Slattery & Carlson describe the syllabus as a ***"contract between faculty members and their students, designed to answer students' questions about a course, as well as inform them about what will happen should they fail to meet course expectations"***.

Habanek stresses the importance of the syllabus as a ***"vehicle for expressing accountability and commitment"***.

Wasley states that ***"the notion of a syllabus as a contract has grown ever more literal".***

According to Jonathan R. Alger ***"a course syllabus is unlikely to stand as an enforceable contract".***

In simple words syllabus is a course control document used for every block of instruction within a training course. It includes objectives of instruction block, duration, support material and guidance scope. It is also called as a plan of instruction.

Following are the different types of syllabus;

1 Grammatical syllabus
2 Lexical syllabus
3 Situational syllabus
4 Text-based syllabus
5 Skill-based syllabus
6 Task-based syllabus
7 Learner-generated syllabus
8 Mixed syllabus
9 Online course syllabus

From the above types of courses, ***skill-based syllabus*** is the need for frontline staff of forest department. As stated earlier documents, the frontline staff (Forest guard, Forester) have knowledge from their educational qualification or they can acquire the same by reading books, reading materials and following other teaching aids. So far as the enhancement skill is concerned, it needs to impart by experts or who have already completed / proven track record of doing same.

syllabus play a variety of valuable functions for different groups within an institution such as a communication mechanism, a planning tool for instructors, a course plan for students, a teaching tool or resource, an artifact for teacher evaluation, and evidence for accreditation.

The function a syllabus serves depends on who is using it. While there are some similarities in use, overall students, faculty, administrators, and accreditation personnel all use the document for different purposes.

The syllabus followed / taught to the forest guards and foresters were reviewed by the experts. The purpose of such review is to assess to relevance of the subjects in accordance with current and future needs for frontline staff. On the review, it is noticed that most of the subjects included in the training of front line staff have relevant and providing both the theoretical and practical knowledge on sustainable forest management and development.

1.2 Training Programme

1.2.1 Period of Training

Considering the higher academic qualifications of Trainees and the need for field oriented training programmes, the period of training for Deputy Ranger and Forest Guards shall be as under:

Table 1: Training Period for Forest Guards and Deputy Rangers

Post	Training Period
Forest Guard	6 months
Deputy Ranger (Promoted)	1 and 1/2 month (6 weeks)
Newly recruited Dy. Ranger	9 months

The training period specified for Deputy Ranger in the above table has been fixed for Deputy Ranger appointed by promotion. If, in future, it is decided to appoint Deputy Ranger by direct recruitment, their training period will be 9 months.

1.2.2 Daily Time Table

a. The periods of theory and practical for Deputy Ranger and Forest Guards shall be as under: 5 sessions a day (60 minutes each) including practical.

   In addition, physical training will be held every morning from 5.30 am to 6.30 am and there will be games every evening from 5.00 pm to 6.00 pm. *(Timing can be changed for Winter)*

b. Yoga training will be provided in the period prescribed for physical training above
c. Similarly, Martial Arts will be taught
d. In the time prescribed for games, the trainees will practice various games under the direction of the Games Instructor. If a trainee is found to excel in a particular sport/game, the Games Instructor will arrange a special training and practice for him/her
e. The Director of the institute can make minor changes in the time prescribed for physical training and games. However, no change will be permitted in the total duration.

1.2.3 Distribution of Days of Training

The detailed calculation of days available for various activities during training period is given for Forest Guards. According to this calculation, the days for main activities of teaching,

after allowing for holidays, joining, inauguration, cultural programme, sports, examination, closing ceremony etc., have been prescribed as under:

Table 2 : Details of Calculation of Days available in 6 Months Training Course for Forest Guards

Sl. No	Descriptions	Durations
1	Duration of the course (Six months)	30 days/month x 6 weeks=180 days- (1)
2	Sundays excluding tour days	18 days- (2)
3	Gazetted Holidays	10 days- (3)
4	Registration and orientation	1 day- (4)
5	Examination	12 days- (5)
6	Preparation of results/Sport function & Hobby Competitions	4 days- (6)
7	Passing out parade and convocation	1day- (7)
8	Relief	1day-(8)
9	Effective working days	(1)-{(2)+(3)+(4)+(5)+(6)+(7)+(8)+(9)}=113days 168-55=113
10	Classroom sessions including practical	65 days (65*5 sessions =325 hours)
11	Excursions (Saturdays)	20 days
12	Tour Days	28 days

1.3 Training Curriculum for Forest Guards

1.3.1 .Duration:

The duration of the course shall be of six months.The course should be adhered to the following:

- ☞ While implementing the syllabus, the classroom environment should be participatory rather than of conventional monologues. Techniques like group discussions, group works, seminars, mock sessions etc. should be employed.

- ☞ During the period of training, self-studies and library use should be encouraged and time and facilities should be provided for this.
- ☞ Similarly tours and excursions should provide more opportunities for in-depth studies and hands on practice.

1.3.2 Study tours:

In addition to the subjects, study tours shall be conducted during the course as decided by the Director / Principal. Study tours will cover the practical aspects of training. In addition training in weapons shall also be imparted.

- ☞ In order to provide the trainees with the knowledge and experience of some of the best practices and working and to provide them first-hand information of field programmes, exposure visits will be organized within and outside the State.
- ☞ In addition to providing the trainees with the knowledge and experience of the best practices and working, they will be encouraged to carry out works themselves. For this purpose, experiments and exercises will be designed in advance.
- ☞ Every trainee shall be required to submit a Tour Journal within a week from the date of return from every exposure visit. This Tour Journal shall be evaluated by the trainer who accompanied them on exposure visit. Trainees would be encouraged to prepare the TJ in electronic format with appropriate illustrations etc.
- ☞ The concerned trainer shall also submit a report to the Director of the Institute after the exposure visit, which will mention cases of any serious indiscipline, the knowledge gained by them (for this a short test is suggested on the last day of the tour), facilities made available and time spent by DFO/ ACF/ RFO with the trainees during the visit, suitability and usefulness of sites for visit and suggestions for future. Necessary improvements for future visits shall be made on the basis of this report.

1.3.2.1 Study tours assessment:

There shall be two study tours during the training. Total number of days dedicated for tours shall be 28. Performance of the trainee during study tour shall be assessed in the following manner:

Tour/field exercises max. Marks (each tour)

(i) Tour examination	40
(ii) Tour journal	25
(iii) Quiz test	10
(iv) Tour symposium	10
(v) Botanical collection	15
Total:	100

Total marks in two tours: 200

If a trainee fails to appear in any tour examination/ quiz test/ symposium or does not submit tour journal and botanical collection he/she shall be awarded zero marks in the concerned item. In case the absence is due to any of the following reasons:

A. Bereavement/ serious illness of parents, brother, sister, wife, son, daughter.

B. Hospitalization/ confinement to bed.

C. To attend court/duty in the interest of government,

The trainee shall be awarded average of the marks obtained in previous tour examinations.

1.3.3 Viva-voce:

At the end of the training each 'officer trainee' shall be required to undergo viva before a panel of experts who shall evaluate knowledge of the trainee. There shall be maximum of 100 marks for viva-voce.

1.3.4 Conduct marks:

Based on overall conduct, each trainee shall be awarded conduct marks out of maximum of 100 marks at the end of the course. Allocation of these 100 marks will be based upon five criteria, each consisting of 20 and shall be given by every member of the faculty including the Director to each candidate. The Director and the faculty shall have similar weightage. The final conduct marks will be the average of the marks given by the Director and the faculty members. The criteria shall be –

(a) Attendance

(b) Discipline

(c) Interpersonal relations with peers

(d) Interpersonal relations with faculty

(e) Extra-curricular activities

Abstract of marks for the course

S. No.	Item	Total
1.	Written examination	1100
2.	Tour examination	200
3.	Viva-voce	100
4.	Conduct marks	100
	Total	1500

1.3.5 Final order of merit:

At the end of the course, a list shall be prepared showing final order of merit based on the marks obtained in examinations and other assessments.

1.3.6 Certificate:

Following category of certificate shall be awarded to the successful 'officer trainee'

At the end of the course:

Table 3: Category of Certificate Awarded

S. No.	Medal in	Total of	Category
1.	Overall Topper	Highest Marks in Total	Gold
2.	Forestry	Silviculture, Forest Mensuration& Management, Soil And water Conservation and Joint Forest Management	Silver
3.	Wildlife	Wildlife and Biodiversity Conservation, Forest Botany and Utilization	Silver
4.	Forest Survey and Engineering	Forest Survey and Engineering, Application of Modern Tools and techniques in Forestry	Silver
5.	Forest Protection	Accounts and Procedures , Forest Protection and Law	Silver

1. **Honours' certificate:** an 'officer trainee' who has obtained 75% and above of the total number of marks provided he has cleared all subjects in first attempt.

2. **Pass certificate:** an 'officer trainee' who has obtained (i) not less than 50%, or (ii) more than 75% and above of the total number of marks, but not cleared all subjects in first attempt.

The prizes may be awarded to the meritorious 'officer trainee' according to the guidelines framed for award of such prizes.

1.3.7 Examinations and Marks

Examinations: There shall be final examinations at the end of the training. The schedule of examination will be decided by the Director.

Maximum Marks: The distribution of maximum marks for the final examinations will be as under:

Table 4: Distribution of Maximum Marks for Training Course for Forest Guard

S. No	Subject	Theory	Practical	Total
1	**Silviculture**	**80**	**20**	**100**
1.1	General Silviculture			
1.2	Silviculture of Trees and Silvicultural Systems			
1.3	Regeneration Methods			
2	**Forest Botany and Utilisation**	**80**	**20**	**100**
2.1	Forest Botany			
2.2	Forest Utilisation			
3	**Forest Protection and Law**	**80**	**20**	**100**
3.1	Forest Protection			
3.2	Forest Laws			
4	**Forest Mensuration and Management**	**80**	**20**	**100**
4.1	Basic Mathematics			
4.2	Forest Mensuration			
4.3	Forest Management			
5	**Soil and Water Conservation**	**100**	**0**	**100**
5.1	Soil Conservation			
5.2	Watershed Management			
6	**Wildlife and Biodiversity Conservation**	**80**	**20**	**100**
6.1	Biodiversity Conservation			
6.2	Wildlife Conservation			

S. No	Subject	Theory	Practical	Total
6.3	Status of Wildlife in HP			
6.4	Wildlife Management			
7	**Forest Survey and Engineering**	**70**	**30**	**100**
7.1	Forest survey			
7.2	Forest Engineering			
8	**Accounts and Procedures**	**80**	**20**	**100**
8.1	Accounts			
8.2	Rules			
9	**Application of Modern Tools & Techniques in Forestry**	**60**	**40**	**100**
9.1	Computer Application			
9.2	Use of GPS			
9.3	Ecosystem Services & Payment for Ecosystem Services, Ecotourism etc.			
9.4	Climate Change and Global Warming			
9.5	On-going Externally Aided Projects in H.P.			
9.6	REDD and REDD+.			
10	**Joint Forest Management**	**80**	**20**	**100**
10.1	Introduction			
10.2	Gender Issues			
10.3	Community Based Organisation			
10.4	PRA &Micro-planning			
11	**Human Resources Development &Management**	**50**	**0**	**50**
11.1	Individual Behaviour			

S. No	Subject	Theory	Practical	Total
11.2	Team Building			
11.3	Motivation			
11.4	Leadership			
11.5	Supervisory Skills			
11.6	Dealing with Public and Media			
11.7	Time Management			
11.8	Stress Management			
11.9	Communication Skills			
12	**First Aid and Disaster Management**	**30**	**20**	**50**
12.1	First Aid			
12.2	Disaster Management			
	G. Total			**1100**

a. **Rules:**

Any trainee who fails to obtain at least 50% of the total marks in a subject listed above shall be considered to have failed in that subject.

No trainee whose attendance at the Institute falls below 80% shall be permitted to appear in the examination. If a trainee misses more than10% of any tour he/ she shall have to repeat the missed portion unless exempted by the Director. If a trainee fails in not more than three subjects, he/she shall be required to appear in supplementary examination(s) in the paper(s) he/she has failed. The supplementary examination(s) shall be conducted by the Director at the end of the examination. Marks originally obtained in such subjects shall only be counted towards merit. If he/she fails in more than three subjects or again in supplement examination, even in one subject, he/she may be required to repeat the full course.

b. **Re-examination**:

c. An trainee may be allowed to appear in re-examination if he remains absent with prior permission of the Director due to any of the following reasons:
   A. Bereavement/ serious illness of parents, brother, sister, wife, son, daughter.
   B. Hospitalization/ confinement to bed.
   C. To attend court/duty in the interest of government.
   Marks obtained in such an examination shall count towards merit.

2. COURSE CONTENTS FOR INDUCTION TRAINING OF FOREST GUARDS

2.1 Subject-wise allotment of Hours

Sr. No.	Subject	Classroom session (Theory + Lab Practical) Hours	Excursions (days)
1	**Silviculture**	**40**	
1.1	General Silviculture	10	2
1.2	Silviculture of Trees and Silvicultural Systems	15	2
1.3	Regeneration Methods	15	1
2	**Forest Botany and Utilisation**	**30**	
2.1	Forest Botany	6	1
2.2	Forest Utilisation	24	1
3	**Forest Protection and Law**	**46**	
3.1	Forest Protection	15	1
3.2	Forest Laws	31	2
4	**Forest Mensuration and Management**	**28**	
4.1	Basic Mathematics	8	
4.2	Forest Mensuration	10	
4.3	Forest Management	10	1
5	**Soil and Water Conservation**	**25**	
5.1	Soil Conservation	18	
5.2	Watershed Management	7	2
6	**Wildlife and Biodiversity Conservation**	**30**	
6.1	Biodiversity Conservation	5	
6.2	Wildlife Conservation	5	
6.3	Status of Wildlife in HP	10	
6.4	Wildlife Management	10	2
7	**Forest Survey and Engineering**	**40**	
7.1	Forest survey	18	1
7.2	Forest Engineering	22	1
8	**Accounts and Procedures**	**15**	
8.1	Accounts	9	
8.2	Rules	6	1
9	**Application of Modern Tools & Techniques in Forestry**	**33**	
9.1	Computer Application	23	

9.2	Use of GPS	5	
9.3	Ecosystem Services & Payment for Ecosystem Services, Ecotourism etc.	2	1
9.4	Climate Change and Global Warming	1	
9.5	On-going Externally Aided Projects in HP.	1	
9.6	REDD and REDD+.	1	
10	**Joint Forest Management**	**20**	
10.1	Introduction	4	
10.2	Gender Issues	2	
10.3	Community Based Organisation	4	
10.4	PRA &Micro-planning	10	1
11	**Human Resources Development & Management**	**11**	
11.1	Individual Behaviour	1	
11.2	Team Building	2	
11.3	Motivation	1	
11.4	Leadership	1	
11.5	Supervisory Skills	1	
11.6	Dealing with Public and Media	1	
11.7	Time Management	1	
11.8	Stress Management	1	
11.9	Communication Skills	2	
12	**First Aid and Disaster Management**	**7**	
12.1	First Aid	4	
12.2	Disaster Management	3	
	Total	**325 Hours**	**20 days**

2.2 COURSE CONTENTS

Sr. No.	Contents	Theory
1	**Silviculture (Theory 36 hours and Practical 4 Session)**	
1.1	**Introduction:** • **Brief history of Forestry in the State:** Overview of forest resources of the state, Different categories of forests of the State. • **Role of forest:** Importance of forest - general and special, Protective, Productive, Aesthetic functions, Environmental Conservation.	**10 hours**
	• **Various Stages of Growth:** Seedling, Sapling, Pole, Tree, Crown	
	• **Factors governing growth of Forests:** Climate, Topography and Aspect, Edaphic and Biotic factors.	

	• **Classification of Forests:** Forest Types according to Champion and Seth classification with specific reference to Forest Types in HP.	
	• **Silvicultural Operations:** Definition, Need, Weeding and cleaning, Pruning, Lopping, Singling, Pollarding, Coppicing, Climber cutting, Thinning and types of Thinning	
	Excursion & Field Study: During the tour and Saturday, excursions, growth, factors, plant succession, forest types and stages of growth will be observed.	**2 days**
1.2	**Regeneration of Forests:** • **Natural regeneration:** Natural regeneration from seed, natural regeneration from coppice and factors affecting natural regeneration from coppice, Assisted Natural Regeneration (ANR) – Enrichment / gap planting in barren patches; weeding, cleaning, climber cutting and thinning and cultural operations. • **Artificial regeneration:** Definition and objectives of artificial regeneration, afforestation and reforestation, choice of species and selection of site, methods of sowing, stump planting and assisted natural regeneration. Artificial v/s natural regeneration – merits and demerits. • **Nursery Techniques:** Selection of site, layout, preparation of beds, fencing, selection of plus trees, seed collection, pre-treatment of seeds, time and methods of sowing, filling of polybags/root trainers, pricking out seedlings, culling and grading, root pruning and hardening shifting of polybags, green and organic manure and fertilizer application, main diseases, methods of controlling diseases, shading, watering and weed control in the nursery. • **Hitech Nursery:** Poly house, green house, hardening area, mist/fog sprinkler, temperature, humidity control, use of root / growth hormones in vegetative propagation as in Taxus. • **Tall Plants:** Raising of tall plants as per SOP. • **Planting Operations:** Site selection, survey and demarcation, GPS tagging of site, Geo-tagging of site photographs, season of planting, aligning according to spacing, staking/marking, pitting, transport of seedlings, manuring, mulching, weeding, nurse crop, cover crop, under planting, frost protection and replacing casualties / fence repairing, fire and general protection.	**15 hours**
	Excursion & Field Study: During the tour and Saturday excursions nursery and planting operations, assisted natural regeneration with indigenous species such oaks, walnut, bamboo etc, will be shown through field work including documentation.	**2 days**
1.3	**Silviculture of Trees and Silvicultural Systems:** • **Silviculture of trees:** Study of habitat, distribution, soil and	**15 hours**

	climate requirements and phenology of 15 economically and ecologically important species of HP. **Annexure 1:** List of important species. • **Silvicultural Systems:** Introduction, classification of Silvicultural Systems - High Forest Systems and Coppice Forest Systems and description in brief of important systems followed in HP.	
	Excursion & Field Study: During the tour and Saturday excursions, trainees will be shown the Silvicultural Systems and Silviculture of such species that are met with in tours and excursions.	1 day
2	**Forest Botany and Utilisation (Theory 26 hours and practical 4 sessions)**	
2.1	**Forest Botany:** Plant Morphology:- Main parts of tree - Crown, leaf, stem, flowers, bark, root, fruit, seed, phyllotaxy etc., Local, English and Botanical names of 50 important species along with their habitat, identification, characteristics and uses.	**6 hours**
	Field Excursions: Collection of herbarium specimen, field identification of 50 important species.	1 day
2.2	**Forest Utilisation:** ➢ Definition of forest produce and NTFP, classification of NTFP, availability of NTFP in HP, importance of NTFP and Timber products. ➢ Timber Products:- Definition of forest produce, Timber and Fire Wood, Implements used in felling and logging – Axe, Saws, power chain saw cable puller, Wedge, Bill Hook, Tool maintenance. General rules for economic felling, advantages and disadvantages of different modes of felling, Season for felling, Methods of conversion Logging, squaring, rough dressing and squaring, machine sawing, description of converted timbers, railway sleepers, Grading of timber. ➢ Disposal of Timber - Transportation Methods, Working of Forest Corporation, Various types of depots-Forest depot, Transit depot, Sale depot, Records/returns for above. ➢ Use of timbers of common species - Industrial and other basic uses of wood. ➢ Introduction to wood seasoning and wood preservation, Common defects in timber such as abnormal growth dry rot, red rot, heart rot, borer attack, bends and twist, climber attack and different kinds of shakes. ➢ Fuel – wood, charcoal making and uses:- Method of cutting, collection, stacking of fuel wood, method of measuring (by volume and by weight) drying percent, fuel saving devices such as smokeless improved chullah, biogas plants, solar cookers etc. ➢ Non Timber Forest Products(N.T.F.P.) - Relevant to state in brief:- Name and use of important items of N.T.F.P. barks,	24 **hours**

	honey, wax, resin, katha. ➢ Important Medicinal plants. Trees, Herbs, Shrubs- techniques of ex-situ conservation. ➢ Edible Forest produce: Tubers, leaves, fruits, seeds, etc. ➢ Resin Tapping- Enumeration, Rill Method, Bore Hole Method and maintenance of record (preparation of damage bill etc).	
	Field Excursion: Identification of important wood products and N.T.F.P., Visit to Forest Depot.	1day
3	**Forest Protection and Law (Theory 42 and Practical 4 Sessions)**	
3.1	**Forest Protection:** ➢ Why Forest protection - Factors responsible for degradation of forests: fire, cattle, man and natural calamities (flood, frost and drought). ➢ Forest Fires: causes, types and effect on forests, Prevention measures: fire lines, early control burning, Combative measures: beating with bush brooms, counter firing , watch towers, fire watchers, use of fire fighting equipment, reporting of fire damages, use of modern fire fighting equipments. ➢ Grazing: Extent and effects of grazing and browsing, Grazing policy / rules of HP, thumb rules relating to carrying capacity of forests, Preventive measures - fencing i.e. stone wall, barbed wire, social fencing, Cattle proof trench, live fencing, Regulation of grazing - rotational grazing, controlled, deferred, stall feeding etc. ➢ Man: Illicit felling - Cause, extent, prevention & control measures, Beat systems, Forest CPs, Flying Squads, Means to tackle and address issues of forest protection - knowing vulnerable points, regular patrolling, group patrolling, local networks, information on smugglers, rewards and incentives, Good relation with public (Fairness in TD), ➢ Encroachments/Un-authorised Occupation - Cause, extent, maintenance of boundaries of forests, prevention & control, Introduction to revenue terminology. ➢ Case studies to be discussed.	15 **hours**
	Field Excursion and Practical: To acquaint with Fire fighting tools, Fire lines etc	1 day
3.2	**Forest Laws:** Definition and legal Classification of forests - forests, forest officer, forest produce cattle, vehicles, seizure and confiscation. ➢ Reserved forests: reserved lands, protected forests, village forests, private forests, revenue forests and unclassified forests. ➢ Detection of offences: powers of forest officer; detection, investigation, custody of seized produce; preparation and filing of offence report/ first information report; preparation of seizure report; arrest of the accused; detention of accused	**31 hours**

	(Human Right Issues); compounding/ prosecution of the case; custody of seizures; non-bail able warrants; punishment for various violations ➢ Acts & rules related to forests: Study of the **important sections** of these acts: -Indian Forest Act or State Forest Acts as the case may be; Forest Conservation Act, 1980, FRA, 2006; IPC; Criminal procedure code; LPA 1978, HP PPA, 1971, HP Non - Biodegradable Act, Mining Rules; Timber Distribution rule, 2013, Fire rules, special forestry - related acts/ rules of the State. ➢ Forest produce - Transit rules, 2013; transit of forest produce, Transit Pass, Confiscation of tools, Saw Mill Regulation Rule, Sale of Timber Act, 1968. ➢ Right to Information Act: Background, Genesis, Salient feature, PIO, Appeal, Record Maintenance, Case studies. ➢ Labour Laws and Minimum Wages Act. ➢ Case studies to be discussed.	
	Field Excursion and Practical: Visit to nearby Range to get acquainted with Damage Reports, seizure and confiscation of forest produce, working of Check post / Naka, A mock session will be conducted in apprehending a forest offender and following the procedure, step by step, till the case is disposed of.	**2 days**
4	**Forest Mensuration and Management (Theory 24 and practical 4 sessions)**	
4.1	**Basic Mathematics:** ➢ Units of measurements of length, area, volume, weight, in British and Metric systems and their conversion factors, simple knowledge of angle, square, rectangle, triangle, circle, cylinder, cones, cubes, trapezoids, perimeter and there are and volume calculation. Fractions, decimals system, percentage and ratio. Slope and area on slopes.	8 **hours**
4.2	**Forest Mensuration:** ➢ Introduction - Definition and objectives of Forest Mensuration. ➢ Measurement of diameter and girth of the standing trees, breast height measurement under different situations, measurements with tape and calliper, advantages and disadvantages. ➢ Measurement of height of trees using Haga Altimeter, Abney level, shadow and stick methods. Simple calculation of volume of trees using volume tables, taper, volume of logs, stacked fire-wood / pulp-wood and diameter classes.	10 **hours**
4.3	**Forest Management:** ➢ Introduction - Definition, scope and principles of Forest Management, objects of Forest Management. ➢ Terms related to Forest management – Working Circle, Felling Series, cutting sections, coupes, Periodic Block,	10 **hours**

	Sustained yield, Rotation and its types, regeneration period, Growing stock. ➢ Working Plan – Introduction to latest Working Plan code, definition, scope and preparation of Working Plan.	
	Field Excursion: Visit to nearby forest to acquaint with simple knowledge of enumerations, silvicultural marking and Working Plans.	1 day
5	**Soil and Water Conservation (25 Sessions)**	
5.1	**Introduction:** ➢ Introduction to Forest Soils. Important forestry spp. of HP with reference to major soil types ➢ Concept and definition of watershed ➢ Indigenous species (like Oaks) for a healthy Hydrological cycle ➢ Water and wind erosion, their causes and effects	**18 hours**
5.2	**Watershed Management:** ➢ **Soil and Water Conservation Measures** – ➢ Vegetative measures: Vegetative barriers / checks, Brushwood and Log wood. ➢ Engineering measures: Contour trenches; Contour stone walls; Earthen / nala bund; Sunken gully pits; Silt traps; ▪ River training/Torrent Control: Retaining wall; Gabion wall; Spur. ▪ Temporary Check dams: Boulder / Loose stone; ▪ Permanent: Gabion Structure; Masonry ➢ Water harvesting: Percolation ponds; Farm ponds; WHS ➢ Land slide control: Bio-engineering species (BES), region wise, collecting planting material and planting ➢ Use of local Grasses/Trees in erosion prone areas; Rehabilitation of Mined Areas / Power Project sites/road.	**7 hours**
	Field Excursion: Study of available SWC measures during tours/excursions. Watershed Management based projects, CAT Plan in HP - Success Stories. Visit to Silt Observatory Post (as in going on EAP's in the State)	**2 days**
6	**Wildlife and Biodiversity Conservation (Theory 26 and practical 4 sessions)**	
6.1	**Biodiversity Conservation**: Definition, meaning and importance of biodiversity, components of Biodiversity, examples of Biodiversity rich areas in Himachal Pradesh and methods of Biodiversity conservation.	5 **hours**
6.2	**Wildlife Conservation:** Definition of wildlife and terms related to wildlife and Protected Area Network e. g. National Park, Sanctuary, Conservation reserves, difference between National Park and Sanctuary, Home range territory etc. In-situ and Ex-situ conservation of wildlife.	5 **hours**
6.3	**Status of Wildlife in HP:** Distribution of wildlife in HP, detail of Protected Areas, Zoos, Breeding and Rescue Centres, Nature Parks etc and introduction to	10 **hours**

	important species of wildlife in HP- Annexure-2.	
6.4	**Management of Wildlife:** In-situ and Ex-situ management of wildlife, management of PA's and concept of buffer and eco-development, habitat management (salt-licks, water holes, watch towers, and food for wildlife) etc. Captive breeding and Zoo management, Wildlife population assessment techniques for pheasants, herbivores such as Ghoral, Musk Deer, Carnivores like Leopards, Bears, Foxes etc, identification and collection of field evidences such as pug marks, bird tracks, kills and droppings etc, use of camera trap, brief idea of migration in birds and wild animals, Human and wildlife conflict, causes and how to mitigate with specific reference to Leopards, Monkeys, Wild Boar, Bear and Blue bull, various traps and tranquilisation. Elementary knowledge of contagious diseases, special mention of Foot and Mouth disease from livestock to wild animals, Preventive measures against important wildlife diseases in HP. Rescue and release guidelines of Himachal Pradesh Forest Department. Effect of Forest Management on Bio diversity, Compensation to damage by wildlife, rates, procedure etc. Important sections of Wildlife Protection Act, 1972, how to prepare wildlife offence cases.	10 **hours**
	Excursion & Field Study: Visit to nearby Protected Area to study wildlife management and human wildlife conflict.	2 days
7	**Forest Survey and Engineering (Theory 32 and practical 8 sessions)**	
7.1	**Forest Survey:** Definition, need and types of survey i.e. Chain, Tape and Compass, testing the accuracy of chain, idea on chain survey and its applicability, General idea about ranging, offset, optical square and Prismatic Compass, traverse – open and closed, methods of traverse, forward and backward bearing, local attractions and its correction, Demarcation and measurement of area with chain and compass. Elementary principles of map reading - definitions, scale, RF and contours, contours intervals, contours map reading, methods of contouring, use of A-Frame.	18 **hours**
	Field Excursions: Visit to nearby work site of any Govt / Public Undertaking agency.	1 day
7.2	**Forest Engineering:** **(a)** Building materials, stone, kinds of stone, Bricks - size, number of bricks required for one cubic meter of brick work, characteristics of Ist class bricks, brief idea about tile, lime cement, sand and metal chips, Mortar – Lime, cement and mud mortar, Concrete – Lime, cement and RCC, **(b)** Building Construction – Selection of site, site levelling, layout plan, foundation, DPC, plinth, super structure, floor, masonry (brick and stone), Doors and Windows – Panel, batton and glazed, Roof – Types of roofs, Plastering and Painting – cement plaster, mud plaster, preparation of surface for plastering and painting, curing and its objects, Water supply and sanitary fitting.	22 **hours**

	(c.) Roads and Paths – Types of forest roads, road alignment in plains and hills, gradient, hairpin bends, camber, super elevation, side and cross drains, Inspection path, bridle paths. **(d)** Estimates – Preparation of simple estimates of structures like retaining wall, breast wall and check dams etc. Simple volume and area calculation of various works such as earth work, whitewashing and calculating the quantities of building materials used in brick and stone masonry.	
	Field Excursions: Visit to study the parts of building, types of roads / paths their parts and drainage, road / path alignment in plains and hills.	1 day
8	**Accounts and Procedures (Theory 11 and Practical 4 Sessions)**	
8.1	**Accounts: -** Organisational structure of Forest Department, Definition and Role of public servant, immunities to Public servant, Duties and responsibilities of Forest Guard, Different types of vouchers for payment, muster rolls, measurement books, their preparation and maintenance, register of sanctioned works, completion reports, lost or missing receipts/vouchers, Cash Book, Beat Manual and its maintenance, Procedure of handing over-taking over charge, charge report, Maintenance of consumable store register, register of stores, tools, writing off of unserviceable stores, Material & Timber Forms etc.	**9 hours**
8.2	**Rules: -** Conduct rules, Do's & Dont's, Disciplinary rules, Leave rules, Travelling allowance rules, Preparation / maintenance of monthly tour diary, Preparation of T.A. Bills and T.T.A. Bills etc.	**6 hours**
	Excursion & Field Study: Visit to Range / Division office.	**1 day**
9	**Application of Modern Tools & Techniques in Forestry (Theory 17 and Practical 16 Sessions)**	
9.1	**Computer Application:** Parts of a Computer in brief, basics of Operating System (Windows), familiarity with internet and e-mail browsing, MS Word, MS Excel, Google Earth, Himachal Bhuvan and using them. To be familiar with the boundaries of his beat and to mark these on a Google Earth image on computer. Alternatively get a good scale print out of such an image and have it laminated.	**23 hours**
9.2	**Use of GPS:** Component of GPS, Working of GPS receiver, Advantages and limitations of GPS, Use of GPS in the field, Calculate area with the help of Way Points taken in the field.	**5 hours**
9.3	**Ecosystem Services and Ecotourism:** Concept of Ecosystem Services, different types of Ecosystem Services and with case study related to Ecosystem Services. Concept of Ecotourism, Ecotourism Policy of HP and its status in HP.	**2 hours**
9.4	Climate Change and Global Warming:	**1 hour**
9.5	REDD and REDD+: CDM, Carbon Credits etc:	**1 hour**

9.6	On going Externally Aided Projects in HP	**1 hour**
	Field Excursion: Field exercise on Payment for Ecosystem Services.	**1 day**
10	**Joint Forest Management (Theory 16 and Practical 4 Sessions)**	
10.1	**Introduction:** Definition of JFM, PFM and CFM. ➢ Need for JFM vis-a-vis conventional forest management and Social forestry. Brief history, Forest Policy of 1988, JFM resolutions and adoption by HP. New guidelines of GoI for FDA, JFMCs constitution.	**4 hours**
10.2	**Gender Issues:** Introduction to gender bias, role of men and women in forestry, how to resolve gender bias and conflicts. Role of women in effective planning, management and sustainable use of forest land resources.	**2 hours**
10.3	**Community Based Organization for JFM:** Facilitate making of SHG,s User Groups on forest based income generation activities e.g. vermicomposting, apricot oil production, handicraft making etc. ➢ Roles and responsibilities of FD (FRO, Dy Ranger and Forest Guard) JFMC and its President, Vice President, Secretary, Treasure, Executive Committee members. ➢ MoU of JFMC, registration under Society Registration Act 2006 and record keeping. ➢ Conducting meetings and Fund Management. What is income, expenditure, Savings and Fund?	**4 hours**
10.4	**PRA and Micro-planning:** ➢ **PRA –** Concept of PRA, Group formation and social mapping, Resource mapping, Transect, Time-line, Seasonal diagram, Matrix scoring, Venn Diagram. ➢ **Micro-Planning –** Planning process (Plan & Action Plan; Micro and Macro plan), Process and steps of MP, Methods, Data collection and its compilation for preparation of Micro-plan, and approval/implementation.	**10 hours**
	Field Excursion: Visit to nearby JFMC and interaction with JFMC members regarding sample Micro-Plan preparation.	**1 day**
11	**Human Resources Development & Management (Theory 11 sessions including classroom exercises)**	
11.1	**Individual Behaviour:** List six types of individual traits, Process of MARS Model of behaviour change, List four types of personalities found in the an organisation.	1 **hour**
11.2	**Team Building:** List at least five skills required for team building and four stages of team building.	1 **hour**
11.3	**Motivation:** List the five needs of Maslow Theory and at least five strategies of motivation.	1 **hour**
11.4	**Leadership:**	1 **hour**

	To know the concept of leadership and types of leadership styles, Traits of good leaders.	
11.5	**Supervisory Skills:** List at least five skills needed for an effective supervisor / supervision.	1 **hour**
11.6	**Dealing with Public and Media:** Define public and media. List at least five skills required for dealing with public, Discuss the process of complaint handling. List the type of media and how to use it for the benefit of organisation / public ?	1 **hour**
11.7	**Time Management:** What is time management? Discuss the importance and techniques of time management.	1 **hours**
11.8	**Stress Management:** What is stress, sources / reasons and how to manage stress?	2 **hours**
11.9	**Communication Skills:** What is communication and types of communication? List at least five barriers of effective communication. Define communication skills, essentials of communication skills and list at least five skills to improve effective communication.	2 **hours**
12	**First Aid and Disaster Management (Theory 4 and Practical 3 Sessions)**	
12.1	**First Aid:** Definition and aims of first aid, explain sprain, strain, epilepsy, burns, insect / snake bite and fractures and their causes, symptoms and treatment. Making of First Aid Kit.	4 **hours**
12.2	**Disaster Management: Disaster Management:** Definition of risk, hazards and disasters, types of disaster, components of disaster management ie preparedness, response, recovery and prevention with specific emphasis on earthquake, fires, land-slides, cloud burst and floods etc.	3 **hours**

ANNEXURE- 1

LIST OF BOTANICAL SPECIES

Trade / Local name	Botanical name
Deodar	Cedrus deodara
Spruce	Picea smithiana
Chir pine	Pinus roxburghii
Blue pine	Pinus wallichiana
Ban oak	Quercus leucotricophora
Silver fir	Abies pindrow
Khair	Acacia catechu
Amla	Emblica officinalis
Harar	Terminalia chebula
Behra	terminalia bellerica
Sissoo	Dalbergia sissoo
Bamboo	Dendrocalamus strictus
Sal	Shorea robusta
Mulberry	Morus alba
Teak	Tectona grandis
Tooni	Toona ciliata

Other important Medicinal & Bioengineering species

ANNEXURE- 2

LIST OF WILDLIFE SPECIES

1. Leopard
2. Snow Leopard
3. Black & brown bear
4. Monkeys & langoors
5. Sambar, barking deer, nilgai
6. Pheasants (Western Tragopan, Cheer , Monal , Peafowl, Red jungle fowl)