CURRICULUM

Technical School Leaving Certificate

Forestry

Council for Technical Education & Vocational Training (CTEVT)

Curriculum Development Division

Sanothimi, Bhaktapur

2020

Table of Contents

Introduction:

This Technical School Leaving Certificate (TSLC) level curriculum in the discipline of Forestry is designed to produce basic level competent workforces. The graduates will be equipped with required knowledge, skills and attitude necessary to this level to meet the demand of the country on the reservation of the community forests and the species. This curriculum focuses on practical skills in which trainees involve in the real work practice. This program combines On-the-Job (OJT) Training with academic instruction for those entering the workforce. OJT program helps individuals put their academic skills to practical use in various careers.

The program extends over 18 months. Theoretical and basic practical skills will be provided in-house classes for twelve months in training institutes. The trainees acquire theoretical knowledge and do practical in the training institutes. In every subject, topical explanations will be followed by demonstrations and in real field practice accompanied by the instruction of instructors.

After completing the 12 months classes in training institutes, students are placed in On the Job Training in the Government and/or Community Forest related organizations for 6 months where they get workplace based practical exposure along with theoretical inputs necessary for the sector under the direct supervision of their supervisors.

Rational

Forestry is a genuine field in the community sector. Many people in the world have been given emphasis on conservation of the forest. This sector has been helping the world for the overall development and it has been creating wage and self-employment opportunities both in the public and private sectors.

Basic level technical workforce are working in the forestry sector without any formal technical education or training at present. They are not able to fulfill the needs of sector/industries due to the lack of skills and knowledge on the latest technology. Based on this curriculum, students will acquire the required skills and knowledge in real-world of work and fulfill the skills gap of this field. Graduates developed through this curriculum apt to the need (no comma) so that they will get employment in the forestry sector, which helps to reduce the poverty in the country. Moreover, the forestry industries have agreed to develop the curriculum and train the students so that they won't have the scarcity of skilled human resources updated with their technologies at low cost.

Course Title:

Technical School Leaving Certificate (TSLC) in Forestry.

Aim:

The aim of the program is to produce basic level competent workforces in the field of forestry required for livelihood improvement of community through the participatory methods in association with government organizations and community forestry user groups.

Programme Objectives

This curriculum has the following objectives to:

1. prepare basic level-forestry technicians who are able to work as Forester in different level of forestry related government and nongovernment organizations
2. produce quality human resources to provide operative technical services in public and private forests as well as protected areas
3. meet the demand for such technical workforce for the Forestry sector of Nepal
4. provide extensive field-based experiences to meet specific and growing needs of different forestry stakeholders
5. prepare such technical workforce who will demonstrate a positive attitude and respect for the profession and socio-cultural values
6. create self-employment opportunities immensely

Group size:

The group size will be a maximum of 40 (forty) in a batch.

Entry Criteria:

Individuals with the following criteria will be eligible for this program:

- SEE with any grade and any GPA (Since 2072 SLC).
- SLC (Before 2072 SLC).
- Pass entrance examination administered by CTEVT.

Course Duration

The total duration of this curricular program is 18 months including 6 months **On the Job Training (OJT).** Moreover, one academic year consists of a maximum of 40 academic weeks and one academic week consists of a maximum of 40 hours excluding the evaluation period.

Medium of Instruction:

The medium of instruction will be in English and/or Nepali language.

Pattern of Attendance:

The students should have 90% attendance in theory classes and practical/industrial practice to be eligible for internal assessments and final examinations.

Instructor and Student Ratio:

- Overall ratio of teacher and student must be 1:10 (at the institution level).
- Teacher and students ratio for theory class should be as per the nature of classroom
- Teacher and student ratio for practical should be 1:10
- Minimum 75% of the teachers must be fulltime.

Qualification of Instructors

- Bachelor's degree in Forestry or Diploma in Forestry with three years' experience.

Preferable Skills:

- Good communication/instructional skills
- Experience in the related field

Instructional Media and Materials:

The following instructional media and materials are suggested for effective instruction, demonstration, and practical.

- Printed Media Materials (Assignment sheets, Handouts, Information sheets, Individual training packets, Procedure sheets, Performance Checklists, Textbooks, etc.).
- Non-projected Media Materials (Display, Photographs, Flip chart, Poster, Writing board, etc.).
- Projected Media Materials (Multimedia, Overhead transparencies, Slides, etc.).
- Computer-Based Instructional Materials (Computer-based training, Interactive video, etc.)

Teaching Learning Methodologies:

The methods of teaching for this curricular program will be a combination of several approaches such as:

- Theory: Lecture, group discussion, Assignment, Group work.
- Practical: Demonstration, Observation, and Self-practice, guided practice, tutorial.
- Industrial Practice: Real practice under the supervision of Industrial Supervisor.

Evaluation Details:

- The distribution of marks for theory and practical tests will be as per the marks given in the course structure of this curriculum for each subject. Ratio of internal and final evaluation is as follows:

S.N.	Particulars	Internal Assessment	Final Exam	Pass %
1	Theory	50%	50%	40%
2	Practical	50%	50%	60%
3	Industrial Practice	100%		60%

- There will be three internal assessments to be administered by the institute and one final examination in each subject at the end of program. Moreover, the mode of assessment and examination includes both theory and practical or as per the nature of instruction as mentioned in the course structure.
- Every student must pass every internal assessment to appear the final exam.
- Continuous evaluation of the students' performance is done by the related instructor/ trainer/ industrial supervisor to ensure the proficiency over each competency under each area of a subject specified in the curriculum.
- Performance evaluation of industrial practice should be done by the related forestry officers/ trainer (Industrial Supervisor).

Provision of Back Paper

There will be the provision of back paper but a student must pass all the subjects within three years from the enrollment date; however, there should be a provision of chance exam for the students as per CTEVT rules.

Disciplinary and Ethical Requirements

1. Intoxication, insubordination or rudeness to peers will result in immediate suspension followed by the review of the disciplinary review committee of the institute.
2. Dishonesty in academic or practical activities will result in immediate suspension followed by administrative review, with possible expulsion.
3. Illicit drug use, bearing arms in institute, threats or assaults to peers, faculty or staff will result in immediate suspension, followed by administrative review with possible expulsion.

Grading System:

The grading system will be as follows:

Grading	**Overall marks**
Distinction	80% or above
First division	75% to below 80%
Second division	65% to below 75%
Third division	Pass aggregate to below 65%

Certificate Awarded:

1. Students who have passed all the components of all subjects are considered to have successfully completed the course.
2. Students who have successfully completed the course will be awarded a degree of **"Technical School Leaving Certificate in Forestry".**

Career Path:

The graduates will be eligible for the position equivalent to Non-gazette 2nd class (technical) as Forester or as prescribed by the Public Service Commission of Nepal and other related agencies. They are also eligible to apply for the entrance examination for the Diploma in Forestry study organized by the CTEVT.

Course Structure

SN	Subject	Mode	Total Hours		Distribution of Marks						Total Marks
					Theory			Practical			
			Theory	Practical	Int.	Final	Time	Int.	Final	Time	
1	Silviculture and Forest Management	T+P	80	120	25	25	2	40	40	2	130
2	Wildlife Biology and Protected Area Management	T+P	80	200	25	25	2	65	65	3	180
3	Soil Conservation and Watershed Management	T+P	64	96	20	20	2	30	30	2	100
4	Community Based Forest Management	T+P	40	200	10	10	2	65	65	3	150
5	Forest Measurement, Harvesting and Utilization	T+P	40	120	10	10	2	40	40	3	100
6	Nursery Practice and Plantation Management	T+P	30	50	10	10	2	15	15	2	50
7	Forest Protection	T+P	64	96	20	20	2	30	30	2	100
8	Forest Law and Administration	T+P	48	72	10	10	2	25	25	2	70
9	Forest Survey and Mapping	T+P	40	80	10	10	2	25	25	2	70
10	Occupational health, safety and first Aid	T+P	40	40	10	10	2	15	15	2	50
Sub Total			**526**	**1074**	**150**	**150**		**350**	**350**		**1000**
11	On The Job Training (OJT)	**P**	0	960	0	0			500		500
	Total		**526**	**2034**	**150**	**150**		**350**	**850**		**1500**

Silviculture and Forest Management

Credit hours: 5 hrs/week
Total hours: 200 hrs
Theory: 80 hrs
Practical: 120 hrs

Course Description:
This course provides basic knowledge in Silviculture and Management of Forest and Tree including agro-forestry and urban forestry. The course introduces students with the knowledge of characteristics of tree and forests in natural and manmade environments, and enables them towards preparing a simple management/operational plan for sustainable management this important renewable natural resource.

Course Objectives:
After the completion of this course, students will be able to:

1. Describe basic silviculture and ecology of some important forest and farm tree species of Nepal
2. State the definition, scope, logic and principles of forest management
3. Outline the basics of growing stock, increment and annual allowable cut, rotation, sustainable forest management, and ecosystem services
4. Apply technical skills in supporting the preparation of a simple forest management/operational plan
5. Define and classify agroforestry systems and practices
6. Identify suitable species for diverse purposes indifferent agro-ecological zones of Nepal
7. Describe the roles of urban trees and forests in modern neighborhoods, communities, towns, and cities

Course Contents:

Unit 1: Silviculture and silvicultural system **10 hrs**

1.1 Definition of silviculture and silvics
1.2 Objectives
1.3 Relation of silviculture with forestry and its branches
1.4 Silvicultural system
    1.4.1 Definition
    1.4.2 Classification
    1.4.3 Different silvicultural systems
        - Clear felling system
        - Shelter wood system
        - Selection system
        - Coppice system

Unit 2: Locality factors and plant succession **8 hrs**

2.1 Locality factors
    2.1.1 Definition of locality factors and their importance
    2.1.2 Classification of different locality factors
        - Climatic factors

- Topographical factors
- Edaphic factors
- Biotic factors

2.2 Plant succession

2.2.1 Concept of plant succession

2.2.2 Kinds of succession (Primary, Secondary)

2.2.3 Causes of succession

2.2.4 Concept of climax

Unit 3: Identification techniques of selected tree species 12 hrs

3.1 Dendrology

3.1.1 Introduction

3.1.2 Relationship of dendrology with Plant Taxonomy and Silviculture

3.1.3 Wood anatomy and dendrology, basic tools to identify tree species with wood structure (conifers, broadleaved trees, and lianas)

3.2 Silvicultural characteristics of selected tree species:

3.2.1 *Indigenous species*: Sal, Sissoo, Khair, Simal, Katus, Chilaune, Utis, Champ, Bakaino, Pines (Chir and Blue), Deodar,andLothsalla

3.2.2 *Fodder trees*: Badahar, Nimaro, Khanyu, Tanki

3.2.3. *Exotic species*: Eucalyptus, Teak, Popular

Unit 4: Basic concepts in forest management 16 hrs

4.1 Introduction to forest management

4.1.1 Definition, objectives and scope of forest management

4.1.2 History of forest management in Nepal

4.2 Growing stock, increment and annual allowable harvest

4.2.1 Definition of growing stock, increment and their types

4.2.2 Determination of growing stock, increment and annual allowable harvest

4.3 Rotation or production period

4.3.1 Definition and concept of rotation

4.3.2 Types of rotation

- Physical and silvicultural
- Rotation of maximum volume production and technical rotation
- Rotation of highest income and financial rotation

4.4 Ecosystem goods and services from forest

4.4.1 Concept of ecosystem services

4.4.2 Various categories of ecosystem services and their examples – provisioning, regulation, cultural, and supportive

4.4.3 Concept of payments for ecosystem services (PES)

4.5 Sustainable forest management and forest certification

4.5.1 Definition, objectives and concept of sustainable and scientific forest management

4.5.2 Principles, criteria, indicators and verifiers of sustainable forest management

4.5.3 Forest certification and various schemes of forest certification

Unit 5: Classification of forest in Nepal **4 hrs**

5.1 Geographical and climatic or ecological
5.2 Legal
5.3 Territorial/administrative
5.4 Silvicultural
5.5 Functional
5.6 Age
5.7 Composition
5.8 Growing stock

Unit 6: Forest management plan/operational plan **4 hrs**

6.1 Definition, objectives and scope of forest management plan
6.2 Characteristics of good management plan

Unit 7: Agroforestry systems and practices **20 hrs**

7.1 Agroforestry
- 7.1.1 Definition of agroforestry
- 7.1.2 History of agroforestry in Nepal
- 7.1.3 Components of agroforestry
- 7.1.4 Principles, objectives and characteristics of agroforestry
- 7.1.5 Importance and scope of agroforestry based on economic, social and environmental reasons
- 7.1.6 Disadvantages and or limitation of agroforestry

7.2 Agroforestry systems classification
- 7.2.1 Purpose of agroforestry classification and criteria used for agroforestry systems classification (structural basis, functional, socio-economic and ecological basis)
- 7.2.2 Major Agroforestry systems and practices in Mountain, Hills and Terai region of Nepal
  - Agri-silviculture
  - Horti-silviculture
  - Silvipastoral system
  - Agri-silvo-pastoral systems
  - Aqua-Silviculture
  - Shelter belts and wind breaks
  - Home garden
  - Alley cropping
  - Taungya agroforestry
  - Shifting cultivation (Slash and burn)

7.3 Species selection for different agroforestry practices
- 7.3.1 Multipurpose species
- 7.3.2 Fodder and forage species
- 7.3.3 Fuel wood species
- 7.3.4 Shade trees
- 7.3.5 Timber species
- 7.3.5 NTFPs of different agro-ecological zones etc suitable for agroforestry practices
- 7.3.6 Green manure, its function and cultivation practices

7.4 Major agroforestry-based production systems in Nepal
    7.4.1 Fruit based agroforestry production
    7.4.2 Vegetable based agroforestry production
    7.4.3 Animal based production systems
7.5 Utilization of abandoned and underutilized lands through agroforestry and private forestry
    7.5.1 Farming systems of Nepal and its components.
    7.5.2 Agriculture farm land abandonment and its causes
    7.5.3 Selection of best agroforestry options for abandoned agriculture lands
    7.5.4 Development of private (agro-) forests in abandoned agriculture lands

Unit 8: Urban forestry **6 hrs**

8.1 Introduction
8.2 The benefits and costs of trees and forests in urban areas
8.3 Inventory of urban tree and forest
8.4 Identification of suitable tree species (indigenous and exotics) for urban forestry plantation
8.5 Urban forestry in the context of environment friendly local governance–local, state and national level policy, rule and regulation for the management of urban forestry

Practical: **120 hrs**

1. Conduct a study tour to identify different plant species, succession, and their composition/ combination in forest and farms/agroforestry of different agro-ecological zones of Nepal and report. (tropical/subtropical/temperate/ vegetation zone)- Min. 5 days (excluding travel) 36 hrs

2. Visit the Divisional Forest Office /Dendro Lab and collect available information on wood (species) identification technique 8 Hrs

3. Observe and analyze different silvicultural systems and a tree with forest management practices in different forest management regimes and present. (e.g. government and community-managed etc.) 16 Hrs

4. Determine growing stock, increment and annual allowable harvest of a forest 10 Hrs

5. Conduct a field exposure on locally available agroforestry practices 12 Hrs

6. Use increment borer to extract annual rings of different locally available trees 12 Hrs

7. Appraise urban forest in nearby sites in relation to sustainability, institutional arrangements, and ecosystem services 6 Hrs

8. Participate in volunteer events such as environment day, earth day, campus/college celebration day, neighborhood tree planting and report. 20 Hrs

References:

- वनसंवर्धन शास्त्र (नेपाली), बबन प्रसाद कायस्थ (2034) पाठयक्रम विकाश केन्द्र, त्रिभुवन विश्वविद्यालय।
- Silvics of Trees of Nepal, Baban Prasad Kayastha (1985). Community Forestry Development Project, Kathmandu, Nepal
- Textbook of Dendrology S.N. Mishra (2012). Arjun Publishing House
- Dendrology by William M. Harlow (Author), E.S. Harrar (Author), James W. Hardin (Author, Editor), (1995).Mcgraw-Hill Series in Forest Resources
- Manual on Afforestation in Nepal by J. K Jackson (1994) Forestry Research and Survey Centre (FRTC)
  Ministry of Forest and Soil Conservation, Babarmahal, Kathmandu. Available online http://nkcs.org.np/dfrs/ecfl/?r=565 (Volume-I) &http://nkcs.org.np/dfrs/ecfl/?r=569 (Volume-II)
- Principles and Practice of Silviculture by L.S Khanna (2015). Khanna Bandhu, Dehradun, India
- Forest Management by Ram Prakash (2006). International Book Distributors, Dehradun, India
- Agroforestry Systems in Nepal, Revised edition by S. M. Amatya, E. Cedamon and I. Nuberg (2018). Agriculture and Forestry University, Rampur, Nepal. Available online: https://www.iufro.org/download/file/29095/1317/Agroforestry_Systems_and_Practices__in_Nepal__2018__pdf
- An Introduction to Agroforestry by P. K. Nair (1993). Kluwer Academic Publisher, the Netherlands
- Agroforestry Training of Trainers Manual by M. R. Joshi et al (2018) IUCN/FAO Kupandol, Lalitpur Nepal
- The Potential of Urban Forestry in Developing Countries: A Concept Paper by Jane Carter (1993). Food and Agriculture Organization (FAO) Rome. Available online http://www.fao.org/3/t1680e/T1680E00.htm

Wildlife Biology and Protected Area Management

Credit Hour: 7 hrs/week
Total: 280 hrs
Theory: 80 hrs
Practical: 200 hrs

Course Description:
This course will provide skill and knowledge to basic concept, definition and identification and biology of a major wildlife group of Nepal including mammals, Bird, Reptile, Amphibian, and Insect. It will provide the concept of a buffer zone and human-wildlife interaction and ecotourism in protected areas of Nepal.

Course Objectives:
After the completion of this course, students will be able to:

1. Identify representative wildlife groups- mammal, birds, reptiles and amphibians of Nepal with a focus on the protected list.
2. Explain the ecological information of representative wildlife of the major group of wild animals of Nepal.
3. Explain the function of the buffer zone.
4. Compare and contrast the buffer zone and human wildlife interaction in the protected area and buffer zone.
5. Identify the main communicable diseases from animals to humans.
6. Explain the status of ecotourism in the protected areas and its general products and services.

Course Contents:

Unit 1: Protected areas and ecosystems of Nepal **4 hrs**

1.1 National Parks (NP), Wildlife Reserves (WR), Hunting Reserve (HR),Conservation Areas (CA), Buffer Zone of Protected Areas (NP, WR, HR) and Ex-situ Conservation (Zoo, Zoological garden, Botanical gardens)

1.2 Biodiversity Conservation Approaches (Species, genetic and ecosystem levels)

1.3 Major ecosystems of Nepal

1.4 Significance of protected areas in Nepal

Unit 2: Characteristics of major groups of wildlife with a focus on protected wildlife by the government **14 hrs**

2.1 Mammals

2.2 Aves (Bird)

2.3 Reptiles

2.4 Amphibians

2.5 Insect (invertebrate):Insect, butterfly, moth, bee, Ant, Wasp

Unit 3: Biology of the representative species of the protected wildlife by the government 14 hrs

3.1 Classification of vertebrates

3.1.1 Mammals

3.1.2 Aves (Bird)

3.1.3 Reptiles

3.1.4 Amphibians

3.2 Classification of invertebrates

3.2.1 Insect: Beetle, Butterfly, Moth, Bee, Ant, and Wasp

Unit 4: Park & Protected area management systems 6 hrs

4.1 Law, policies & its enforcement

4.2 Protection of protected areas including buffer zones

4.3 Prohibition and exploitation natural resources including wildlife

4.4 Research and monitoring of biodiversity

4.5 Administration of protected area

4.6 Zoning of protected area

4.7 Conservation education

4.8 Visitor center and Information center management

Unit 5: Habitat Management 10 hrs

5.1 Philosophy of creation and construction and maintenance /management of wildlife habitat needs seasonally

5.2 Grassland creation and maintenance

5.3 Wetland /waterhole construction and management

5.4 Fire line/forest road construction and management-both for fire control, patrolling, wildlife use and tourism management

Unit 6: Communicable disease between human and wildlife 6 hrs

6.1 Zoonotic disease (Lyme disease; West Nile virus; Dengue, malaria, and chikungunya, Salmonella infection; E. coli infection ; Ebola or Ebola hemorrhagic fever; Anthrax; Tuberculosis; Brucellosis; Taeniasis; Rabies; Highly pathogenic avian Influenza (HPAI); Echinococcosis, canine distemper virus)

Unit 7: Buffer-zone management 4 hrs

7.1 Definition of buffer zone

7.2 Importance of the buffer zone

7.3 Buffer zone management techniques

7.4 Park-people conflict and its management

7.5 People's participation ~~for~~ in conservation

7.6 Anti-poaching

Unit 8: Human Dimension **6 hrs**

8.1 A different perspective of wildlife management in human dimension domain

8.1.1 Introduction

8.1.2 Legal, economic and social perspective

8.1.3 Major issues in wildlife conservation in Nepal

8.1.4 Building relationship between park and people and improving coordination

Unit 9: Ecotourism **10 hrs**

9.1 Terms and terminologies: Backpacking and Hiking, Camping; Rafting, fishing, hunting, bird-watching, jungle walk; Canoeing, Kayaking, elephant riding, horse riding

9.2 Travel and tourism

9.3 Dimensions of travel

9.4 History and growth of tourism in Nepal

9.5 Types of tourists

9.6 Principles of eco-tourism

9.7 Motivation for environmental tourism

9.8 Limitations of eco-tourists

9.9 Introduction to tourism legislation and regulations

Unit 10: Visitor Management and impact of tourism **6 hrs**

10.1 Visitor activities

10.2 Radio communication

10.3 Visitor center

10.4 Information display

10.5 Sign posts (signage arrow)

10.6 The positive and negative impact of tourism

10.7 Economic impacts of tourism

10.8 Socio-cultural impacts of tourism

10.9 Environmental impacts of tourism

10.10 Hospitability management

Practical: **200 hrs**

1. Visit and observe any zoo or mini zoo or zoological garden or any facility where few locally available wild animals and discuss the biology taught in theory 40 hrs
   - Mammals
   - Aves (Bird)

- Reptiles
- Amphibians
- Insect (invertebrate): Insect, butterfly, moth, bee, Ant, Wasp

2. Visit natural history museum or nearby museums to observe the displayed, preserved animals, defecation/pellet, antlers, preserved wildlife and their parts- 8 hrs

3. Visit nearby Protected area or protected forest or biodiversity hotspots to observe the mammal, birds, reptile, amphibian, invertebrates and discuss the biological information taught in theory 8 hrs

4. Observe bird in self-organized bird watching or organized by other institutions and prepare seasonal bird checklist (3 hours/month for a year, preferably on non-class days such as in Saturday and holidays). 40 hrs

4.1 Visit nearby wetland in the migratory season to observe wetland birds. 8 hrs

5. Visit a site where visitor information center or interpretation or display center is available, to observe tourism information, product and services are displayed; observe wildlife breeding or rearing center and wildlife rescue. 8 hrs

6. Conduct the following exercises from a nearby appropriate PA to help identify wildlife with Population estimation in fields. 48 hrs
   - 6.1 Transect survey for mammal and bird. 8 hrs
   - 6.2 Point count survey for bird. 8 hrs
   - 6.3 Road side count for mammal particularly deer species. 4 hrs
   - 6.4 Pellet-group counts of deer using the belt method. 4 hrs
   - 6.5 Identify and enlist vegetation and learn vegetation sampling by different quadrat method for tree, shrub and herb/grass 6 hrs
   - 6.6 Bird identification in different habitats and routes 6 hrs
   - 6.7 Observe and quantification of human-wildlife conflict and mitigation measures adopted. 8 hrs
   - 6.8 Observe different types of ecotourism facilities, product, services available on vicinity 4 hrs

7. Identify the following wildlife items 8 hrs
   - 7.1 Horns and Antlers 1 hrs
   - 7.2 Skull and skin of major carnivores (tiger, common leopard, snow leopard and or other canid's and or felid's), 2 hrs
   - 7.3 Defecation of different wildlife species including scat, dung, pellet 2 hrs
   - 7.4 Foot marks of different wild animals found in the area/region 2 hrs
   - 7.5 Preserved wildlife specimens-skin, skeleton, bird, fetus. 1 hrs

8. Observe habitats in a Protected Area or forest and report them: 22 hrs
   - 8.1 Grassland 3 hrs

8.2 Wetland 3 hrs
8.3 Shrub-land 3 hrs
8.4 Forest 3 hrs
8.5 Fire-line 3 hrs
8.6 Invasive species 3 hrs
8.7 Observe and report different habitats of wildlife and its management. 4 hrs

9. Conduct eco-tourism related activities in any nearby tourism destination 10 hrs
   9.1 Homestay, star hotels, products and services 3 hrs
   9.2 Observe the types of activities offered to domestic and international visitors, 3 hrs
   9.3 Conduct basic survey in different areas by forming groups and prepare a report 4 hrs

References:

- Baral, H.S. and K.B. Shah 2008. NEPALKA STANDHARI BANYAJANTUHARU Wild Mammals of Nepal. Himalayan Nature (In Nepali and English vernacular)
- Yadav, B.R. and N. Rupakheti 2075 BS.NEPALKA SANRAKCHIT CHETRAMA JAIBIK BIBIDHTA SANRAKCHAN TATHA BYABASTHAN Conservation and management of biodiversity in protected areas of Nepal. Anita Laxmi Maharjan and Mithila Rupakheti. Sigma General Offset Press, Sanepa, Lalitpur, Nepal (In Nepali vernacular)
- Grimmett, R.; Inskipp, C., Inskipp, T. &H.S. Baral 2017 (revised 1st edition). Birds of Nepal Bloomsbury Publishing
- Shah, K.B. &Tiwari, S. 2004. Herpetofauna of Nepal : a conservation companion. IUCN Nepal. Gopal, R..2012. Fundamentals of Wildlife Management. Natraj Publishers, Dheradun, India.
- Bajimaya, S. Managing Human-Wildlife Conflict in Nepal In Acharya, K.P. and Dhakal, M. (eds) 2012 .Biodiversity Conservation in Nepal : A Success Story. Department of National Parks and Wildlife Conservation, Babar Mahal, Kathmandu, GPO Box 860, Tel: 4220912, 4220850 (https://www.researchgate.net/publication/272354436_BIODIVERSITY_CONSERVATION_IN_NEPAL_A_SUCCESS_STORY assessed on 1 Oct.2019

Soil Conservation and Watershed Management

Credit Hour: 4 hrs/week
Total hours: 160 hrs
Theory: 64 hrs
Practical: 96 hrs

Course Description:

This course is designed as an elementary course on soil conservation and watershed management. It combines the information of Soil science, Soil conservation, and Watershed Management. In general, students learn the fundamental concepts and principles of soil and water conservation practices in Nepal.

Course Objectives:

After the completion of this course, students will be able to:

1. Describe the importance of soil conservation and watershed management.
2. Assess the basic physical and biological properties of soils in the field
3. Identify and collect representative soils sample/pit sites
4. Describe soil profile, structure, depth, and porosity
5. assess the principles of soil conservation and watershed management
6. appraise the different types of erosion and their consequences,
7. Define watershed and describe the watershed components,
8. Identify the various types of erosion and soil conservation activities
9. Explain the use of low-cost soil conservation techniques.

Course Contents:

Unit 1: Soil Science **8 hrs**.

- 1.1 Introduction to soil and soil profile 3 hrs.
  - 1.1.1 Definition of soil
  - 1.1.2 Difference between forest soil and agricultural soil
  - 1.1.3 Soil types and its profile
- 1.2 Soil Ecology 5 hrs.
  - 1.2.1 Biotic and abiotic factors
  - 1.2.2 Role of microorganisms in the soil
  - 1.2.3 Nutrient cycling in soil
  - 1.2.4 The relationship between organic matter and microorganisms
  - 1.2.5 Role of organic matter in soil fertility and structure

Unit 2: Physical and Chemical Properties of Soil **10 hrs**.

- 2.1 Physical and Chemical Properties of Soil 4 hrs.
  - 2.1.1 Soil depth, Soil texture, Soil structure, Soil porosity, Soil density
  - 2.1.2 Soil pH, Soil color, Soil buffering
  - 2.1.3 Soil acidity, alkalinity and salinity
- 2.2: Percolation and infiltration 4 hrs.

2.2.1 Surface run off
2.2.2 Percolation and infiltration
2.2.3 Difference between percolation and infiltration
2.2.4 Ground water movement in soil

2.3: Soil plant relationship 2 hrs.

2.3.1 Soil plant relationship
2.3.2 Necessary nutrients in the soil for plant growth

Unit 3: Factors Affecting Soil Formation 4 hrs.

3.1 Climate-Weathering process (Physical, Chemical &, Biological Weathering)
3.2 Living organisms
3.3 Topography
3.4 Parent material
3.5 Time

Unit 4: Principles of Soil Conservation and Watershed Management 6 hrs.

4.1 Basic concept of soil and water conservation 2 hrs.

4.1.1 Concept of soil and water conservation,
4.1.2 Importance of soil and water resources

4.2: Watershed Management 4 hrs.

4.2.1 Definitions of the terms watershed/sub-watershed and watershed boundary
4.2.2 Objectives of watershed management
4.2.3 Characteristics of watershed (climatic, physiographic etc.) and its components
4.2.4 Integrated watershed management efforts and activities in Nepal

Unit 5: Soil Erosion and its Consequences 12 hrs

5.1 Definition of soil erosion and its processes 1 hrs.
5.2 Types of soil erosion 1 hrs.
5.3 Causes of soil erosion 1 hrs.
5.4 Factors affecting soil erosion 1 hrs.
5.5 Major factors affecting soil erosion 1 hrs.
5.6 Consequences of erosion 6 hrs.

5.1.1 Gully formation
5.1.2 Landslides
5.1.3 Damage caused by soil erosion
5.1.4 Sedimentation
5.1.5 Poverty

Unit 6: Soil Conservation Measures 12 hrs.

6.1 Physical/Engineering Measures 2 hrs.
(Basic concept on physical measures: check-dam, retaining wall, diversion cannel, terrace improvement, embankment)

6.2 Biological Measures 4 hrs.

6.2.1 Plantation and seeding
6.2.2 Use of manures, fertilizers and mulching
6.2.3 Control of grazing/rotational grazing

6.2.4 Manipulation of cropping patterns

6.3 Bio-engineering Measures 4 hrs.
- 6.3.1 introduction of bio-engineering measures
- 6.3.2 engineering functions of plants
- 6.3.3 benefits of bio engineering measures

6.4 Extension Programs for Soil and Water Conservation 2 hrs.
- 6.4.1 Need and importance of extension of soil conservation
- 6.4.2 Tools and techniques for extension

Unit 7: Low Cost Soil Conservation Techniques **12 hrs.**

7.1 Introduction of low-cost soil conservation 1 hrs.

7.2 Importance and its applications 2 hrs.

7.3 Low cost soil conservation techniques 9 hrs.

(Fascine, Palisade, Brush layering, Rip rap, Jute netting, Watling, Bolstering, Grass/bamboo plant, Hedge row, Live fencing, Diversion channel, Grass waterways, Trenching)

Practical: **96 hrs**

1. Conduct a field visit to the new soil excavated site of the construction area and observe, explain, and report field visits about soil profile. 4 hrs.
2. Visit different land-use sites and estimate soil texture and identify soil color and report output of field visit. 8 hrs
3. Conduct one day excursion to collect soil samples and field report presentation. 6 hrs
4. Conduct a field visit to a nearby areas of problematic soils and observe, assess the existing soil problem, and present field report. 4 hrs
5. Arrange a field visit to nearby rural road construction sites to watch and perform vegetative measures for soil conservation and group report presentation. 8 hrs.
6. Conduct a field visit to the construction areas where the student learns and practice gabion works/ stone masonry works etc. and share the field experiences. 8 hrs
7. Arrange a field visit to estimate the slope of the terrain, practice and compare instrumental vs. ocular estimation method, and share field experience of slope measurement. 4 hrs
8. Conduct a field visit to sub-watershed area where students learn to collect basic data for land use plan and watershed management preparation; from already developed questionnaire /checklists. 12 hrs
9. Conduct a field practices for sloping agriculture land Technology (SALT). 6 hrs
10. Arrange a field tour to the suitable sites, where the students observe and practice to construct the following low-cost soil conservation techniques and present their experiences and learning. 36 hrs.
    - 10.1 Fascine
    - 10.2 Palisade
    - 10.3 Brush layering
    - 10.4 Rip rap
    - 10.5 Jute netting
    - 10.6 Watling
    - 10.7 Bolstering
    - 10.8 Grass/bamboo planting

10.9 Hedge row
10.10 Live fencing
10.11 Diversion channel
10.12 Grass waterways
10.13 Trenching

References:

- Brady, Nyle C. and Weil Ray R. T*he Nature and Property of Soils*, 14th edition
- Hodson, Norman (1995). *Soil Conservation* Lowa State University press. Ames, IA.
- Jackson, J.K. (1994) *Manual of Afforestation in Nepal.* Kathmandu: Forest Research and Survey Center. 2nd edition.
- *Soil Conservation and Watershed Management Measures and Low-cost Techniques*, 2004. Kathmandu: Department of Soil Conservation and Watershed Management
- Howell, John. *Roadside Bioengineering, Reference Manual*,1999. Government of Nepal Departments of Roads, Babar Mahal, Kathmandu, Nepal.

Community Based Forest Management

Credit Hour: 6 hrs/week
Total hours: 240 hrs
Theory: 40 hrs
Practical: 200 hrs

Course Description:
This course is designed to enhance the knowledge and skill of the forester to perform their duties effectively and efficiently. However, this course will provide fundamental knowledge on basic concept, definition, and approaches of community forest (CF) as well as the other community-based forest management systems (CBFM) in practice in Nepal, mainly collaborative forest management (CFM), leasehold forestry (LHF), religious forest management and buffer zone community forestry (BZCF).

Course Objectives:
After the completion of this course, students will be able to:

1. Explain different types of community-based forest management systems implemented and executed in Nepal
2. Define each community-based forest management systems.
3. Explain the importance of CBFM.
4. Acquire knowledge on handing over the process of CF and other CBFM system
5. Explain the development process of CF and other CBFM system.
6. Describe the CF development guidelines.
7. Apply the RRA/PRA tools in the process of CBFM development
8. Control over the forest fire and encroachment.

Course Contents:

Unit 1: Community Based Forest Management System **8 hrs**

1.1 Introduction,
1.2 Objectives
1.3 Evolution
1.4 Community Forest
1.5 Leasehold Forest
1.6 Collaborative Forest Management
1.7 Religious Forest
1.8 Buffer Zone Community Forest
1.9 Terminologies used in Community Based Forest Management

Unit 2: Hand Over Process of Community Based Forest Management **5 hrs**

2.1 Community Forest
2.2 Leasehold Forest
2.3 Collaborative Forest Management
2.4 Religious Forest
2.5 Buffer Zone Community Forest

Unit 3: Role of Forester in CBFM **4 hrs**

3.1 Job description
3.2 Skills required to perform Community Based Forest Management
3.3 Rapport building techniques to work with community

Unit 4: Rapid Assessment Tools **9 hrs**

4.1 Definition PRA/RRA Tools
4.2 Application of PRA/RRA tools
- 4.2.1 Observation
- 4.2.2 Selection of key informants
- 4.2.3 Discussions with Interest Groups
- 4.2.4 Sketch/participatory mapping
- 4.2.5 Transect walk
- 4.2.6 Prepare seasonal calendar
- 4.2.7 Information collection through questionnaire
- 4.2.8 Forest profile preparation by rapid assessment

Unit 5: Components of Community Forestry Development Guidelines **4 hrs**

5.1 Investigation
5.2 Negotiation
5.3 Operation Plan Preparation
5.4 Operation Plan Implementation
5.5 Operation Plan Review and Monitoring

Unit 6: Issues and Challenges in Community Based Forest Management **6 hrs**

6.1 Timber, Fuel wood, Fodder and Non-timber Forest Products collection and distribution
6.2 Conflicts, disputes, encroachments and forest fire in Community Based Forest Management
6.3 Active vs passive Community Based Forest Management
6.4 Benefit sharing in Community Based Forest Management
6.5 Benefit to pro-poor from Community Based Forest Management

Unit 7: Extension and Motivation in Community-Based Forest Management **4 hrs**

7.1 Definition of forestry extension
7.2 Perception and motivation in Community Based Forest Management
7.3 Effective communication tools for Community Based Forest Management
7.4 Methods of forestry extension

Practical: **200 hrs**

Practical 1: Community Forestry Development Guideline Familiarization **100 hrs**

- Observe Community Forest, transect walk and identify important tree species for timber, fuel wood, fodder and Non-timber Forest Products
- Prepare participatory map (Social & Forest)
- Identify interest group and key informants
- Conduct meeting and assembly
- Perform investigation

- Perform negotiation
- Practice on operational plan preparation and implementation processes.
- Re-visit the operational plan and submit.

Practical 2: Socio-Economic Survey **50 hrs**

- Collect data on the demand ~~of~~ for timber, fuel wood, fodder and Non-timber Forest Products
- Conduct group meeting and assembly
- Collect socio-economic data (household survey)
- Perform well-being ranking

Practical 3: Community-Based Forest Management Monitoring **50 hrs**

- Monitor operational Plan implementation status of CBFM
- Monitor forest product distribution in CBFM
- Assess fund collection and record-keeping in CBFM
- Assess benefit to pro-poor
- Roll play on Conflict and dispute management
- Assess the status of forest encroachment and fire

References:

- Dongol, B. B.S. 2004. Extension Education, Published by Prativa Singh Dongol, Kathmandu, Nepal.
- GoN, MoFSC, 2071. Community Forestry Development Guidelines, 2071
- GoN, MoFSC, 2068. Forest Encroachment Control Strategy, 2068
- GoN, MoFSC, 2067. Forest Fire Management Strategy, 2067
- HMG, 2051. Forest Regulation, 2051
- J. K. Jackson, 1994. Manual of Afforestation in Nepal, vol. 1 & 2. Forest Research and Survey Center, Kathmandu, Nepal.
- Jackson, W.J. and Angels, A.W. 1998. Participatory Techniques for Community Forestry, A field manual, IUCN.
- Negi, S.S. 2008. Forestry Extension Handbook, International Book Distributers, Dehradun, India
- Sim, D. and Hilmi, H.A. 1987. Forestry Extension Methods, FAO, Rome
- S. M. Amatya and K. R. Shrestha, 2010. Nepal Forestry Handbook

Forest Measurement, Harvesting and Utilization

Credit Hour: 4 hrs/week
Total hours: 160 hrs
Theory: 40 hrs
Practical: 120 hrs

Course Description:

This course is based on the job description of the forester to perform their duty effectively. This course is the combination of forest harvesting, utilization, non-timber forest product, and forest-based enterprises. The course will provide the candidates the basic knowledge and skills required in forest measurement, harvesting, and utilization.

Course Objectives:

After the completion of this course, students will be able to:

1. Measure logs and swan timber to determine the volume
2. Stake making of fuel wood in different stake sizes and measurement of the volume
3. Apply various tools and techniques of forest harvesting & logging.
4. Maintenance of harvesting tools
5. Apply the appropriate method of logs transportation and depot management
6. Perform record keeping of logs and timber grading

Course Contents:

Unit 1: Forest Measurement **6 hrs**

- 1.1 Definition
- 1.2 Objectives
- 1.3 Importance and requirement
- 1.4 Forest inventory, sampling and enumeration
  - 1.4.1 Random sampling
  - 1.4.2 Systematic sampling
  - 1.4.3 Measurement of height and diameter of standing trees

Unit 2: Measurement of Logs and Fuel Wood **6 hrs**

- 2.1 Introduction (length, diameter, girth and cross-section)
- 2.2 Volume calculation of logs and fuel wood
- 2.3 Calculation of volume of sawn timber
- 2.4 Procedure of Chatta /stake preparation and measurement

Unit 3: Definition and Concept of Harvesting **4 hrs**

- 3.1 Harvesting of tree, pole and Non-timber Forest Products and concept of utilization
- 3.2 Appropriate time of harvesting of forest products
- 3.3 Felling of trees
- 3.4 Seasons of harvesting
- 3.5 Defects of timber

Unit 4: Harvesting Tools and Maintenance **6 hrs**

4.1 Identification of harvesting tools (Axe, saw, power chain saw and crosscut saw)
4.2 Storage and maintenance of harvesting tools
4.3 Harvesting technique (general rules, marking of trees, recording keeping, method of harvesting trees, poles and Non-timber Forest Products)

Unit 5: Safety Measures, Transportation and Depots Management **8 hrs**

1.1 Safety measures and ergonomics in harvesting and transportation
1.2 Extraction of logs (sliding, rolling and skidding)
1.3 Loading and unloading by manual and mechanical methods
1.4 Transportation of timber, fuel wood and other forest products
1.5 Log depots and managements
1.6 Method of stacking logs, timber, poles and Non-timber Forest Products

Unit 6: Wood Preservation **2 hrs**

6.1 Importance of wood preservation
6.2 Method of wood preservation

Unit 7: Forest Products Utilization **8 hrs**

7.1 Definition
7.2 Identification of important Non-timber Forest Products and their uses
7.3 Marketable Non-timber Forest Products in Nepal
7.4 Utilization of important Non-timber Forest Products in Nepal
7.5 Introduction, importance and uses of Forest based enterprise.
(Such as Pulp and paper, Duna Tapari, Catch and Katha, Resin tapping, saw mills and furniture, Bio-briquette and charcoal)

Practical: **120 hrs**

Practical 1: Perform Measurement of Logs and Preparation of Fuel Wood Stack **30 hrs**

- Log measurement
- Sawn timber measurement
- Forest inventory, sampling and enumeration
- Hollow formation and measurement
- Net volume calculation
- Fuel wood stake formation
- Visit Forest Based Industry and identify the products, process of manufacturing, source of raw material and prepare the report

Practical 2: Perform Timber Grading **16 hrs**

- Timber grading (Visit depot of Collaborative Forest and Timber Corporation)
- Defects of timber assessment practice

Practical 3: Perform Measurement of standing trees **16 hrs**

- Measurement of height
- Measurement of diameter

- Volume calculation of standing trees

Practical 4: Application of Harvesting tools **8 hrs**

- Use harvesting tools
- Perform maintenance of tools
- Perform storage of tools

Practical 5: Identification of Non-timber Forest Products **18 hrs**

- Conduct Field visit and identify important Non-timber Forest Products
- Visit any Non-timber Forest Products nursery, identify and list out NTFPs.
- Visit any NTFP based enterprises; identify the products, process and report.

Practical 6: Practice of Harvesting and Logging **16 hrs**

- Mark the trees and harvesting of trees
- Harvest poles and NTFPs.

Practical 7: Major Timber Identification **16 hr**

- Visit nearby forest, identify and enlist major commercial timber species and report.

References:

- Amatya, S. M. and Shrestha, K. R. 2010. Nepal Forestry Handbook.
- GoN, Department of Tourism. 2018. Tourism Statistics.
- GoN, MoFE, 2073. Forest Product collection and Distribution Guidelines 2073, Ministry of Forest and Environment.
- Khanna, L.S. and Chaturvedi, A.N. 2015. Forest Mensuration and Biometry, Khanna Bandhu, Dehradun, India.
- Mehta, Tribhawan, 2011. A Handbook of Forest Utilization, International Book Distributor, Dehradun, India.

Nursery Practice and Plantation Management

Credit Hour: 2 hrs/week
Total hours: 80 hrs
Theory: 30 hrs
Practical: 50 hrs

Course Description:
The course introduces students with the knowledge and practices of seed collection, nursery and plantation operations, and major tending operations in natural and plantation forests.

Course Objectives:
After the completion of this course, students will be able to:

1. Employ technical skills in seed collection
2. Apply nursery management skills
3. Construct a nursery.
4. Perform plantation, thinning, pruning and other tending operations.
5. Choose area and tree species for afforestation and reforestation.

Course Contents:

Unit 1: Seed production, nursery practices, plantation and tending **4 hrs**

1.1 Seed year
1.2 Germination capacity and germinative energy
1.3 Plant percent, viability, time of seed collection,
1.4 Methods of seed collection, seed extraction and storage

Unit 2: Nursery practices **6 hrs**

2.1 Introduction to nursery and their types (temporary and permanent)
2.2 Criteria for nursery site selection
2.3 Nursery construction
2.4 Seed beds preparation (Sunken and Raised)
2.5. Seed treatment
2.6 Seedling production (Container, bare, stumps)
2.7 Protection and maintenance of seedlings
2.8 Seed sowing
2.9 Manuring/fertilization
2.10 Nursery equipment/tools

Unit 3: Plantation **6 hrs**

3.1 Appraisal of planting sites (slope, aspect, exposure, vegetation, soil)
3.2 Protection of planting sites (fencing, hedges, walls)
3.3 Ground preparation (manual, mechanical, chemical)
3.4 Spacing and pitting
3.5 Use of appropriate tools
3.6 Care to be taken in handling seedlings
3.7 Plantation versus direct sowing

Unit 4: Tending operations **4 hrs**

4.1 Plantation management
4.2 Importance of tending operation in plantation and natural forests
4.3 Weeding, cleaning and climber cutting
4.4 Assessment and replacement of losses
4.5 Thinning, pruning and removal of 4Ds (dead, diseased, dying and deformed) trees
4.5 Intercropping (taungya)

Unit 5: Afforestation and reforestation techniques **10 hrs**

5.1 General considerations for choosing tree species for afforestation and reforestation
5.2 Specific cases
- 5.2.1 Denuded hill
- 5.2.2 Abandoned cultivated lands
- 5.2.3 Grasslands
- 5.2.4 Reverine lands
- 5.2.5 Road and canal sides
- 5.2.6 Farm forestry
- 5.2.7 Water logged areas
- 5.2.8 Large commercial plantation

Practical: **50 hrs**

1. Apply seed collection, extraction and storage techniques, and experiment seed germination capacity. 10 hrs
2. Conduct the following: 20 hrs
   - 2. 1. Construct forest nursery.
   - 2. 2. Prepare nursery beds.
   - 2. 3. Perform soil mixing and container/poly pot filling.
   - 2. 4. Perform seed sowing.
   - 2. 5. Perform root pruning.
   - 2. 6. Perform root and /or shoot cutting.
   - 2. 7. Perform seedling production including bonsai.
   - 2. 8. Estimate the cost of seedling production and other nursery practices.
3. Perform site preparation, plantation, and cleaning in the nearby plantation area. 10 hrs
4. Perform thinning, singling and pruning practices in nearby community or other ~~forest~~ forests. 10 hrs

References:

- Forestry Seed and Nursery Practice in Nepal by I. Napier and Marcus Robbins (1989). Nepal-UK Forestry Research Project, Forest Research Division, Department of Forest and Plant Research, Kathmandu. Available online http://nkcs.org.np/dfrs/ecfl/?r=483
- Manual on Afforestation in Nepal by J. K Jackson (1994) Forestry Research and Survey Centre (FRTC)
  Ministry of Forest and Soil Conservation, Babarmahal, Kathmandu. Available online http://nkcs.org.np/dfrs/ecfl/?r=565 (Volume-I) & http://nkcs.org.np/dfrs/ecfl/?r=569 (Volume-II)
- Principles and Practice of Silviculture by L.S Khanna (2015). Khanna Bandhu, Dehradun
- Handbook on Afforestation Techniques by R.C. Ghosh (1997). Controller of Publications, Delhi

Forest Protection

Credit Hour: 4 hrs/week
Total hrs: 160 hrs
Theory hrs: 64 hrs
Practical hrs: 96 hrs

Course Description:

This course is about forest protection and provides basic knowledge, skills and attitudinal setup to apply particular protection measure while protecting the forest in particular situation. Total course is divided into two parts the first is theoretical understanding with internalization and the second is practical activities. Having all together 160 hours 64 hours are designed in theoretical parts and remaining 96 hours are designed in practical activities.

Course Objectives:

After the completion of this course, students will be able to:

1. Analyze different damaging agents to the forest and forest nurseries.
2. Explain various protective and preventive measures to control damaging agents.
3. Point out the harmful insects and diseases that damage the forests.
4. Summarize nature as well as the behavior of forest fire damage and limit it.
5. Apply particular protection measures for different damaging situations.

Course Contents:

Unit 1:	**Forest protection in general and legal provisions**	**6 hrs**
1.1	Introduction and importance of forest protection.	1 hrs
1.2	Role of forest protection.	1 hrs
1.3	Forest protection problems/difficulties in Nepal.	1 hrs
1.4	Prevailing federal laws (Acts, regulations and directives) related to forest protection.	1 hrs
1.5	Prevailing state laws (Acts, regulations and directives) related to forest protection.	2 hrs
Unit 2:	**Attitudinal setup for forest protection.**	**3 hrs**
2.1	Concept of people's attitude towards forest protection.	1 hrs
2.2	~~Brining~~ Bringing peoples in the forest protection arena.	1 hrs
2.3	Role of CBFM system in forest protection arena.	1 hrs
Unit 3:	**Biotic and abiotic damaging agents:**	**17 hrs**
3.1	Biotic forest damaging agents (man, animals, and plants) in general.	1 hrs
3.2	Abiotic forest damaging agents (adverse climatic influences and its consequences) in general.	1 hrs
3.3	Encroachment, deforestation and illegal felling.	2 hrs
3.4	Shifting cultivation practices; heavy construction inside the forest lands such as hydropower, road, transmission lines, hotels, buildings, reservoir, and wrong forest polices.	2 hrs
3.5	Forest damage by insects.	2 hrs
3.6	Forest damage by diseases.	2 hrs

3.7	Nursery pests.	2 hrs
3.8	Forest fire and grazing.	1 hrs
3.9	Temperature, Frost, Drought, Rainfall, Snow and sleet, Lightening.	2 hrs
3.10	Wind and storm, Erosion, Shifting sand and noxious gases.	2 hrs
Unit 4:	**Forest grazing and its management.**	**5 hrs**
4.1	Forest grazing intensity and physical effect of grazing.	1 hrs
4.2	Grazing effects on regeneration and fire control.	1 hrs
4.3	Benefit versus injurious from grazing.	1 hrs
4.4	Protection from grazing from domestic and wild animals.	1 hrs
4.5	Regulation of forest grazing.	1 hrs
Unit 5:	**Forest fire and its management:**	**15 hrs**
5.1	Forest fire, its classification and firelines.	1 hrs
5.2	Effects of fire on soil (soil organic matter and nutrients, soil moisture, soil pH, soil temperature, soil biota).	2 hrs
5.3	Effects of fire on the ecosystem: fire and vegetation interaction, fire resilience on plant community, fire and wild fauna, effects of fire on forest and grassland ecosystem in Nepal.	3 hrs
5.4	Effects of fire in the plant succession and as one of the efficient forest management tools in maintaining specific species for biodiversity and other economic benefits for the species.	2 hrs
5.5	Forest fire and root necrosis, tree mortality.	1 hrs
5.6	Fuel chemistry and combustion: fuel, combustion chemistry, pyrolysis, phase of combustion.	2 hrs
5.7	Forest fire monitoring, detection, response system, prevention, preparedness and suppressions.	2 hrs
5.8	Forest fire management strategy in Nepal.	2 hrs
Unit 6:	**Forest encroachment and its control.**	**6 hrs**
6.1	Forest encroachment and its drivers in Nepal.	2 hrs
6.2	The gradual process of forest encroachment and policy defectiveness.	1 hrs
6.3	The relation between infrastructure development and forest encroachment.	1 hrs
6.4	Forest encroachment control strategy in Nepal.	2 hrs
Unit 7:	**Injurious plants and its management:**	**6 hrs**
7.1	Weeds, Climbers, Phanerogamic parasite and Invasive species.	2 hrs
7.2	The excessive number of plants.	1 hrs
7.3	Weeding, climber cutting and removal of parasitic plants.	1 hrs
7.4	Thinning.	2 hrs
Unit 8:	**Control/management plan to different damaging agents:**	**6 hrs**
8.1	The damage detection process of different damaging agents.	2 hrs
8.2	Damage control plan such as forest encroachment.	1 hrs
8.3	Damage management plan such as forest fire and grazing.	3 hrs
	Total:	**64 hrs**

Practical:

1.	Access and list the forest protection difficulties in a particular forest.	**4 hrs**
2.	Identify equipment, tools, chemicals, slides and set specimens to be used in forest protection activities.	**4 hrs**
3.	Identify regions of the insect body e.g. simple and compound eyes, type of antenna, mouthparts and legs.	**4 hrs**
4.	Prepare a list of insects order and family related to forest nursery and crops.	**4 hrs**
5.	Identify larva-pupae of seedlings and tree damaging insects from the collected specimens.	**6 hrs**
6.	Collect and identify forest invasive species eg various forest harmful weeds, climbers and weeds.	**6 hrs**
7.	Perform collecting exercise of borers, defoliator, and bark beetles from the nearby forest area.	**6 hrs**
8.	Identify root disease, heart disease and wilt disease of important tree species from the set specimens.	**6 hrs**
9.	Identify pictorial and specimens of tree and plant disease type like Ganoderma, Armillarea, Fomes, Pythium, Polyporous, and Lenzites.	**8 hrs**
10.	Visit local forest nursery to study the insect and disease symptoms and prepare a report.	**4 hrs**
11.	Visit nearby government forest to study the insect and disease symptoms and prepare a report.	**4 hrs**
12.	Visit nearby protected area (National park) in order to visualize forest protection activities and prepare a report.	**4 hrs**
13.	Visit nearby community forest and buffer zone management area and prepare a forest protection plan.	**6 hrs**
14.	Visit nearest forest/community forest and prepare and submit a fire management strategy as a report in the given outline.	**6 hrs**
15.	Visit nearest forest/community forest and prepare and submit grazing regulation strategy as a report in the given outline.	**6 hrs**
16.	Prepare and submit forest encroachment control action plan in the given outline.	**6 hrs**
17.	Prepare and submit fire management action plan in the given outline.	**6 hrs**
18.	Prepare and submit grazing regulation action plan in the given outline.	**6 hrs**
	Total:	**96 hrs**

References:

- Guide to Lectures Delivered at the Biltmore Forest School By C. A. SCHENCK, Ph. D. Director, 1909. The Inland Press, Asheville, N. C.
- Ban Dadhelo Janakari Pustika, Department of forest, 2074 (In Nepali).
- Crop pests of Nepal and their management, Yubak Dhoj G.C. and Siegfried Keller, 2013 A.D. Printed in Nepal.
- The Ecology and Control of the Forest Insects of India and the Neighbouring Countries, CFC Beesion, 1941. Reprinted in 1993, Bishen Singh Mahendra Pal Singh, 23-A, Connaughat Place, Dehra Dun - 248001, India.

Forest Law and Administration

Credit Hour: 3 hrs/week
Total hrs.: 120 hours
Theory hrs.: 48 hours
Practical hrs.: 72 hours

Course Description:

This course is based on the job description of the forester to perform their duty effectively to maintain law and order in forest administration. This course will provide knowledge to candidates on the principles and practices of forest laws and regulations to maintain governance in forest administration.

Course Objectives:

After the completion of this course, students will be able to:

1. Describe the legal procedure for forest protection and management
2. Describe the legal procedure and prosecution.
3. Explain the process of controlling forest offenses.
4. Apply the legal procedure of controlling forest offenses.

Course Contents:

Unit 1: Forest Act and Regulations **10 hrs**

- 1.1 Terms and Definitions
- 1.2 Legal provisions in protection of forest
  - 1.2.1 Community Forest
  - 1.2.2 Leasehold Forest
  - 1.2.3 Collaborative Forest
  - 1.2.4 Religious forest
- 1.3 Forest Offences and punishment
- 1.4 Investigation and procedural Act
- 1.5 Provision of timber grading
- 1.6 Sales and distribution of forest products
- 1.7 Marking of trees and measuring of timber
- 1.8 Transportation and depot management

Unit 2: National Park and Wild Life Conservation Act and Regulation **8 hrs**

- 2.1 Term and Definitions
- 2.2 Hunting license
- 2.3 Prohibited activities in Protected Area system
- 2.4 Punishment
- 2.5 Investigation of Offences and Procedure
- 2.6 List of endangered and protected animals
- 2.7 Entry provisions in Protected Area
- 2.8 Conservation Area Management
- 2.9 Prohibited activities in Conservation Area

Unit 3: Forest Administration in Nepal **8 hrs**

3.1 Introduction and objectives of forest administration
3.2 Organizational structure and functions (Central, provincial and local levels)
3.3 Office management
  3.1.1 Letter registration and dispatch (Darta and Chalani)
  3.1.2 Letter Writing: personal/official, field report, meeting minute, Pandra rosa
  3.1.3 Filing and record management techniques
  3.1.4 Human Resource/Staff mobilization (for patrolling, conflict management, technical assistance, social mobilization, wildlife rescue)
3.4. Computer application
  3.4.1 Introduction to computer program
  3.4.2 Letter typing and printing
  3.4.3 Email and internet
  3.4.4 Computer handling and caring

Unit 4: Environment Conservation Act and Regulation **5 hrs**

4.1 Term and Definitions, Environment, Pollution, soil conservation and biodiversity
4.2 Environment Protection Act, 2053 and Regulation, 2054 (EIA and IEE)
4.3 CITES Act 2073
4.4 Landslides, erosion control and watershed management
4.5 Pollution control and preservation
4.6 Waste management, biodegradable and non-degradable

Unit 5: Legal Procedure **7 hrs**

5.1 Jaheri pratibedan
5.2 Baramadi muchulka and Bharpai
5.3 Pakrau purjee
5.4 Khantalasi Purjee and muchulka
5.5 Mayad thap
5.6 Ghatanasthal muchulka
5.7 Sarjamin muchulka
5.8 Pratibadi ko bayan
5.9 Abhiyukta lai pesh

Unit 6: Forest Product Harvesting and sales **10 hrs**

6.1 Timber and fire wood harvesting and collection procedures **2 hrs**
  6.1.1 Community Forest
  6.1.2 Government Managed forest
  6.1.3 Leasehold and collaborative forest
  6.1.4 Private forest

6.2 Non-timber forest products harvesting and collection procedures [3 hrs]
  6.2.1 Community Forest
  6.2.2 Government Managed forest
  6.2.3 Leasehold and collaborative forest
  6.2.4 Private forest

6.3 Steps in Timber and Fire wood harvesting **5 hrs**

6.3.1 Plot determination
6.3.2 Marking of trees
6.3.3 Notification
6.3.4 Harvesting permit
6.3.5 Felling and logging
6.3.6 Transportation and depot management
6.3.7 Sales and distribution
6.3.8 Hammering and transport permit

Practical: **72 hrs**

1. **Apply the legal procedure of:** **12 hrs**
   - Tree marking and harvesting permit
   - Verify Marking register
   - Transportation and Depot Management
   - Verify Length and diameter measurement of timber

2. **Apply the legal procedure of:** **12 hrs**
   - Logging of trees and recording of log numbering
   - Timber grading (Visit depot of CFM and TCN)

3. **Perform record keeping and depot management** **12 hrs**
   - Recording keeping of log measurement
   - Depot management with appropriate way
   - Depot checking and verify balance
   - Perform computer typing, printing and handling

4. **Prepare draft of legal documents:** **36 hrs**
   - First information report (FIR)
   - Baramadi muchulka
   - Ghatansthal prakriti muchulka and Site report
   - Pakrau purji
   - Pratibadee ko bayan
   - Sarjamin muchulka
   - Aviyog Patra

References:

- GoN, MoFE, Forest Product collection and Distribution Guidelines, Ministry of Forest and Environment
- HMG, Nepal, Forest Act
- HMG, Nepal, Regulation
- HMG, Nepal, Environment Conservation Act
- HMG, Nepal, Environment Conservation Regulation
- HMG, Nepal, National Park and Wildlife Conservation Act
- HMG, Nepal, National Park and Wildlife Conservation Regulations
- HMG, Nepal, Soil Conservation and Watershed management Act
- HMG, Nepal, Soil Conservation and Watershed management Regulation
- HMG, Nepal, Forest Product Harvesting and Distribution Guidelines

Forest Survey and Mapping

Credit Hour: 3 hrs/week
Total hrs.: 120 hrs
Theory hrs.: 40 hrs
Practical hrs.: 80 hrs

Course Description:
This course aims to provide basic knowledge about the principle of different types of survey techniques, handling of types of equipment and mapping. It provides the student to handle GPS and conduct the GPS survey. Students will be able to estimate areas of community and natural forests after completing this course.

Course Objectives:
After the completion of this course, students will be able to:

1. Explain basic surveying.
2. Define different surveying terms.
3. Acquire the skill of map reading.
4. Collect field data systematically in clear and standard form in GPS surveying, Compass Surveying, Chain surveying.
5. Apply methods and operation of surveying instruments (chain, compass, plane table, leveling, GPS).
6. Explain the elements of direction measurements and Bearings.
7. Apply standard survey methods in surveying horizontal, vertical planes, angular and linear measurements.
8. Co-operate with users group in mapping and calculate forest resources areas.

Course Contents:

Unit 1: Fundamentals of surveying **6 hrs**

1.1 Definition of surveying
1.2 History of surveying
1.3 Basic principle of surveying
1.4 Primary division of surveying
1.5 Classifications of surveying
1.6 Importance, Scope and objectives of surveying
1.7 Mapping fundamentals
1.8 Map and plan
1.9 Scale used in surveying

Unit 2: Distance Measurements **4 hrs**

2.1 Types of measurements in surveying
2.2 System of units use in Nepal
2.3 Methods of distance measurement

2.4 Units of measurement system in Nepal
2.5 Elementary surveying instruments

Unit 3: Chain Survey **3 hrs**

3.1 Introduction and principle of chain survey
3.2 Terms used in chain survey
3.3 Chaining on the sloping ground
3.3.1 Direct
3.3.2 Indirect
3.4 General field procedures in chain surveying

Unit 4: Compass Survey **5 hrs**

4.1 Introduction and purpose of compass surveying
4.2 Surveyor's and Prismatic compass.
4.3 System of bearings, fore and back bearing
4.4 Field book and records
4.5 Local attraction, angle of dip and magnetic declination

Unit 5: Plane Table Survey **4 hrs**

5.1 Introduction and principle of plane table survey
5.2 Instrument for plane table survey
5.2.1 Plane table, Alidade, Plane alidade, Telescopic alidade, Magnetic compass, Plumbing fork.
5.3 Methods of plane tabling – Radiation, Intersection, Traversing and resection
5.4 Radiations methods and procedure

Unit 6: Leveling **5 hrs**

6.1 Definitions and principle
6.2 Importance and technical terms used in leveling
6.3 Methods of leveling
6.4 Field procedure, problems and plotting of graphs.
6.4.1 Testing levels and checking collimation error
6.4.2 Field procedure: Reconnaissance, Observation, Recording, Computation
6.4.3 Precautions to be taken in the field

Unit 7: Contouring **2 hrs**

7.1 Introduction- contours, contours interval, horizontal equivalent
7.2 Uses of contour and characteristics of contour lines

Unit 8: Fundamental of GPS and GIS **11 hrs**

8.1 Introduction to GPS
8.2 History of GPS
8.3 Working principle and segments/components of GPS

8.4 Types of GPS and applications in forestry
8.5 Uses and importance of GPS
8.6 Errors & accuracy
8.7 Integration of GPS and GIS
8.8 GPS handling
8.9 Introduction to GIS, importance and uses of GIS in forestry

Practical:		**80 Hours**
1.	Perform map reading and its components	4 Hours
2.	Fix and set up ranging rod verticality using eye judgment and plumb bob	2 Hours
3.	Range a line by direct ranging using line ranger and eye judgment	2 Hours
4.	Set up reciprocal ranging	3 Hours
5.	Measure distance	
5	5.1 Measure distance by using chain in level ground	3 hours
	5.2 Measure distance by using tape in filed	3 hours
6.	Conduct ranging in the ground	4 Hours
7.	Measure horizontal distance on a slope using tape by stepping method	6 Hours
8.	Perform temporary Adjustment of plane table	6 Hours
9.	Determine horizontal distance from slope distance and vertical angle with Abney's level.	4 Hours
10.	Measure bearing of line with compass	5 Hours
11.	Perform leveling on the field	
	11.1 Handle leveling instrument and it's temporary adjustment	2 Hours
	11.2 Determine the height difference between two points by leveling	3 Hours
12.	Handle and uses of GPS in Field (Demo)	
	12.1 Perform on GPS with inserts battery, on/off, change in system, units, calibrations and marks, enter, quit, save, delete, records and keeping field book etc	6 Hours
13.	Conduct GPS Survey in Community Forest having an area of around 20-30 hectares	
	Features survey	
	13.1 Conduct points survey (well, temple, building, house and importance places etc) within a community Forest.	3 Hours
	13.2 Conduct line Survey (Road, path stream, river, high-tension line etc) within a community Forest.	4 Hours
	13.3 Conduct Polygon survey(Lake, Pond and settlements)	3 Hours
	13.4 Boundary survey of Community Forest	9 Hours
14.	Integrate GPS Survey data in Arc view 3.2 and prepare Community Forest	
	14.1 Entry the Points survey which has collected by using GPS survey in Excel	1 Hour
	14.2 Entry the Line survey which - has collected by using GPS survey in Excel	1 Hours
	14.3 Entry the Polygon and boundary survey which has collected by using GPS survey in Excel	1 Hour
	14.4 Prepare Map and calculate the area of the Community Forest	5 Hours

References:

- R. Agor, A Textbook of SURVEYING and LEVELLING , Khanna Publishers.
- Narayan Basnet & Madhukar Basnet, "Basic Surveying I and II", National Books Centre(Revised Edition).
- Dr. BC Punmia, "Surveying"- Vol I & II, Laxmi Publication New Delhi(Latest edition)
- प्रधानांग तीर्थबहादुर, जमीन सर्वेक्षण, साझा प्रकाशन ।
- Getting to Know Arc view GIS- ESRI
- Introduction to ArcView GIS-ESRI
- Getting to Know ArcView GIS- ESRI
- Singapore street history
- Introduction to GPS –www.what-when-how.com/gps/introduction-to-gps/Global positioning System History:- www.nasa.gov/directorates/heo/scan/communications/policy/GPS_History.html

Occupational Health, Safety and First Aid

Credit Hours: 2 hrs/week
Total hrs: 80 hrs
Theory hrs: 40 hrs
Practical hrs: 40 hrs

Course Description:

This course is designed to provide skill and knowledge to health and safety standards in common forestry operations to the students. Moreover the course will familiarize and provide opportunity to practice basic first aid tools and techniques for anticipated major incidences at work place.

Course Objectives:

After the completion of this course, students will be able to:

1. Enforce safety standards appropriate to their working conditions
2. Promote awareness of and competency in safe work practices
3. Employ ergonomics checklist on the analysis of occupational accident risk factors
4. Manage incident in the field
5. Apply the basic first aid steps in common incidences

Course Contents:

Unit 1: Occupational health and safety **4 hrs**

- 1.1 Definition and key principles
- 1.2 Rights and responsibilities of workers, employers and government
- 1.3 Current situation of health and safety

Unit 2: The worker and the work **4 hrs**

- 2.1 The human body
- 2.2 Energy requirements and physical workload
- 2.3 Work postures
- 2.4 Nutrition
- 2.5 Fatigue
- 2.6 Rest periods and scheduling of working hours
- 2.7 Mental workload and stress
- 2.8 Individual characteristics of the worker
- 2.9 Socio-cultural aspects

Unit 3: Rules, legislation, regulations and codes on occupational health and safety **2 hrs**

- 3.1 National level
- 3.2 International level

Unit 4: Factors affecting the working environment **4 hrs**

- 4.1 Biological and physical factors:
  - 4.1.1 climate
  - 4.1.2 topography
  - 4.1.3 harmful plants
  - 4.1.4 wood

4.1.5 mammals
4.1.6 birds
4.1.7 reptiles
4.1.8 amphibian
4.1.9 insects
4.1.10 infections

4.2 Technological and organizational factors:
4.2.1 design,
4.2.2 use and maintenance of tools and machineries,
4.2.3 noise,
4.2.4 vibration,
4.2.5 harmful substances, (chemicals, solvents, gases, smoke and dust; ventilation draught, pollution, lighting)

Unit 5: Health and safety measures in different forestry operations **4 hrs**

5.1 Working and living conditions
5.2 Nursery work
5.3 Plantation activity
5.4 Wood harvesting and logging, loading and unloading, timber transport, wood processing
5.5 Harvesting of non-timber forest products (NTFPs)
5.6 Forest fire management and control
5.7 Wildlife management (observation, capture, handling, rescue, rehabilitation)

Unit 6: Professional and environmental assessment for incidence prevention **6 hrs**

6.1 Personal protective equipment
6.2 Skills and training
6.3 Risks assessment
6.4 Stress level
6.5 Weather conditions
6.6 Environmental health issues

Unit 7: Use of ergonomics checklist in forestry **4 hrs**

7.1 Introduction to ergonomics checklist
7.2 Example of checklist for different conditions
7.2.1 Materials storage and handling
7.2.2 Hand tools
7.2.3 Machine safety
7.2.4 Workstation design
7.2.5 Lighting
7.2.6 Premises
7.2.7 Welfare facilities
7.2.8 Work organization
7.3 Process of designing locally adapted, handy checklists

Unit 8: First aid **12 hrs**

8.1 Introduction and principles of first aid
8.2 Four steps of the first aid- assess, plan, implement and evaluate
8.3 Becoming a first aider and managing an incident
8.3.1 First aid for common incidences:

(Minor wounds, Bleeding, Burns, Foreign objects, Poisoning, Bites and stings, Drowning, Eye injuries, Nose bleeding, Bone, joint and muscle injuries, Unconscious casualties, Respiratory problems, Extreme heat and cold (Frost bite, altitude sickness, heat wave)

8.3.2 Exhaustion

8.3.3 Medical conditions - heart attack, stroke, fainting, allergies, headache, abdominal pain, vomiting and diarrhea

8.4 Techniques and equipment

8.4.1 Techniques: removing clothing, removing head gear, casualty handling

8.4.2 Basic materials and equipment and their use: adhesive bandages, sterile dressings, sterile eye pad, triangular bandages, safety pins, disposable gloves, roller bandages, scissors, tweezers, alcohol-free wound cleansing wipes, adhesive tape, plastic face shield or pocket mask, notepad and pencil, alcohol gel (hand sanitizer).

8.4.3 Other useful items and their use - blanket, survival bag, flashlight, whistle, flares, warning triangles, and high visibility jacket to keep in the vehicle)

Practical:

Perform the Following Tasks. **40 hrs**

1. Prepare and deliver a short speech on the current situation of health and safety in Nepal. 4 hrs
2. Conduct a round table discussion on national and international rules, legislation, regulations, and codes on occupational health and safety. 6 hrs
3. Design and apply simple ergonomics checklists in different forestry operations 8 hrs
4. Handle equipment used in a first aid box for curing minor wounds. 6 hrs
5. Perform first aid treatments of respiratory problems, poisoning, eye injuries, nose bleeding, unconscious casualties, allergies on a dummy. 8 hrs
6. Demonstrate dressing, bandaging, fast evacuation (single - rescuer), and transportation techniques. 8 hrs

References:

- डाक्टर नभएमाः नयाँ संस्करण (Where There Is No Doctor) Published by: The Hesperian Foundation, 1919 Addison St., #304, Berkeley, California 94704, United States of America (1992).available online at https://hesperian.org/books-and-resources/resources-in-nepali
- Current Situation of Occupational Health and safety in Nepal - A Study Report by Rudra Prasad Gautam and Jiba Nath Prasain (2011). General Federation of Nepalese Trade Unions (GEFONT)
- Handbook on appropriate technology for forestry operations in developing countries by Mikko Kantola (1988)
- Chapter 68 – Forestry of Part X - Industries Based on Biological Resources in Encyclopedia of Occupational Health and Safety 4th Edition
- Introduction to ergonomics in forestry in developing countries, Forestry paper 100 from Food and Agriculture Organization (FAO, 1992)
- First aid manual (5th edition) by American college of emergency physicians (2014)
- बर्दिया संरक्षण कार्यक्रम (२०५९). हिंसक बन्यजन्तुहरु तथा तिनबाट बच्ने उपाय, राष्ट्रिय प्रकृति संरक्षण कोष, बर्दिया संरक्षण कार्यक्रम

On the Job Training (OJT)

Practical: 24 weeks (40/hrs/week)
Total hrs: 960 Hrs

Course Description:
This On-the-job training program introduces students to hands-on skills and broadening of the knowledge through field works and office works in the assigned sector. The course aims to provide trainees an opportunity for meaningful career related experiences by working fulltime in real organizational settings where they can practice and expand their classroom based knowledge and skills before graduating. It will also help trainees gain a clearer sense of what they still need to learn and provides an opportunity to build professional networks. The trainees will be eligible for OJT only after attending the final exam. The institute will make arrangement for OJT. The institute will inform the CTEVT at least one month prior to the OJT placement date along with plan, schedule, the name of the students and their corresponding OJT site. In this regard, the course will normally focus on the area of community-based forest management, soil and water conservation and forest-based entrepreneurship development, wildlife and protected area management for the period of 6 months (**24 weeks**) in three different modules (Module-I, II& III).

Course Objectives:
The overall objective of the On the Job Training (OJT) is to make trainees familiar with firsthand experience of the real work of world as well as to provide them an opportunity to enhance skills. The specific objectives of On the Job Training (OJT) are to;

- apply knowledge and skills learned in the classroom to actual work settings or conditions and develop practical experience before graduation
- familiarize with a working environment in which the work is done
- work effectively with professional colleagues and share experiences of their activities and functions
- strengthen portfolio or resume with practical experience and projects
- develop professional/work culture
- broaden professional contacts and network
- develop entrepreneurship skills on related occupation

Activity:
In this program the trainees will be placed in the real work of the world under the direct supervision of related organization's supervisors. The trainees will perform occupation-related daily routine work as per the rules and regulations of the organization. The implementing institution/school are required to identify the host organization, submit a tentative activity plan to the host organization and get approval/acceptance from them or if necessary~~,~~(No comma) should have a formal agreement with them and teaching institution prior to field visit for each module of OJT as mentioned below:

A.	**OJT- Module-I: Community Based Forest Management (CF/CFM/LHF)**			
S.N.	Activities to be performed	Duration: 2 months (8 weeks/320 Hrs)	Student's evaluation by host organization Full Marks – 100	Evaluation methods

			Pass marks – 60	
1.	***Activity Priority area*** • Perform Community Forest (CF)/Collaborative Forest Management (CFM)/Leasehold Forest (LHF) - Boundary Survey- Preparation of Map, Area calculation • Perform CF/CFM/LHF-Forest Resource Inventory-Volume and growing stock calculation • Use RRA/PRA tools for Socio-economic/Bio-physical data collection and analysis (Demand and dependency on Forest Products- need, interest, problems and opportunities) • Build rapport with CF/CFM/LHF group members • Facilitate group meetings and assemblies. • Prepare a user group constitution • Assist users to prepare a draft CF/CFM/LHF operational Plan/ Scheme. • Assist in CF/CFM/LHF hand over process • Assist CFUGs in the implementation and execution of CF operational plan. • Prepare documents like *Filling, Muchulka and Bharpai* • Write report and present.			*The host organization will evaluate the performance of the students as per the given check list in Annex-1:*
B.	**OJT- Module-II: Soil and Water Conservation and Forest based Entrepreneurship Development**			
2.	**Activities to be performed**	Duration: 2 months (8 weeks/320 Hrs)	Student's evaluation by host organization Full Marks - 100 Pass marks - 60	Evaluation methods
	Activity Priority area **(i) Soil and Water Conservation** • Observe and identify associated types of soil erosion and landslides in the field. • Observe different soil conservation measures adopted in the field • Observe bio-engineering / mechanical methods for soil conservation in the field • Observe (check) dam/retaining wall/ terraces (design and costing) and construction practice • Visit and observe flood affected areas and familiarize with their rehabilitation methods applied. • Familiarize with water sources and identify the conservation methods • Construct and use of water conservation/ harvesting pond • Carry out biophysical/socioeconomic data collection and analysis • Practice on slope stabilization methods in the hills • Conduct group meetings and prepare minutes • Write report and Present **(ii) Forest Based Entrepreneurship Development**			*Host organization will evaluate the performance of the students as per the given check list in Annex-1:*

	• Conduct a project on(any 5) the following forest based enterprises:
	  ○ Bamboo handicrafts
	  ○ Leaf plate
	  ○ Incense stick making,
	  ○ Lokta/Argeli, handmade paper,
	  ○ Beljuice,
	  ○ Saw mills,
	  ○ Furniture,
	  ○ Veneer,
	  ○ Allo processing,
	  ○ Medicinal herb processing
	• Conduct Processing and value addition
	• Perform enterprise registration process
	• Expose on products and marketing
	• Conduct meetings and assemblies
	• Write report and present.			

C.	**OJT- Module-III: Wildlife and Protected Area Management**			
3.	**Activities to be performed**	Duration: 2 months (8 weeks/320Hrs)	Student's evaluation by host organization Full Marks - 100 Pass marks - 60	Evaluation methods
	Activity Priority area • Do consult with Protected Area (PA) authorities and Buffer zone Institutions (Management committee, User committee, and User groups) regarding the OJT. • List out major wild life species available in the OJT area (Mammals, Birds, Reptiles and amphibian) and explore their conservation status • Familiarize with aggressive behaviors of wild lives (carnivores and mega herbivores etc.) and apply safety measures adopted to be prevented from these wildlife's. • Estimate Population in fields (Transect survey, road side count, Belt transect for Pellet-group counts, Antler count, Nest count, circular point bird count). • Conduct indirect wildlife studies and enlist their sign and symptoms • Conduct bird identification in OJT area and list 10 types of birds. • Understand Park-people interface • Assess the problems and constraints of wild life conservation in OJT area. • Find out the process of formation of buffer zone institutions including buffer zone forests • Find out the process of conduction of the group meetings and Annual General Meetings(AGMs) of including bufferzone institutions and buffer zone forests • Prepare and implement Buffer zone Community Forest (BZCF)/LHF operational plan if possible			*Host Organization will evaluate the performance of the students as per the given check list in Annex-1:*

	• Visit wildlife museum, visitor information center, conservation breeding center, rescue centers and prepare a report on their habitat, characteristics, food habits breeding season. • Observe and explain available tourist facilities, services and products of the OJT area. • Prepare field report and submit to the institution	

Potential OJT Placement site:

The nature of work in OJT is practical and potential areas of OJT placement site should be as follows;

- District Forest Offices
- Protected Area (PA) Authorities
- Bufferzone Institutions
- Community Forest User Groups
- Wildlife Conservation Office
- Soil and Water Conservation Related Offices
- Other Related Organization

Requirements for Successful Completion of On the Job Training:

For the successful completion of the OJT, the trainees should;

- submit daily attendance record approved by the concerned supervisor and minimum 144 working days attendance is required
- maintain daily diary with detail activities performed in OJT and submit it with supervisor's signature
- prepare and submit a comprehensive final OJT completion report with attendance record and diary
- secured minimum 60% marks in each evaluation

Complete OJT Plan:

SN	Activities	Duration	Remarks
1	Orientation	2 days	Before OJT placement
2	Communicate to the OJT site	1 day	Before OJT placement
3	Actual work at the OJT site	24 weeks/144 days	During OJT period
4	First-term evaluation	one week (for all sites)	After 6 to 7 weeks of OJT start date
5	Mid-term evaluation	one week (for all sites)	After 15 to 16 weeks of OJT start date
6	Report to the parental organization	1 day	After OJT placement
7	Final report preparation	5 days	After OJT completion

- First and mid-term evaluation should be conducted by the institute.

- After completion of 6 months OJT period, trainees will be provided with one week period to review all the works and prepare a comprehensive final report.
- Evaluation will be made according to the marks at the following evaluation scheme but first and mid-term evaluation record will also be considered.

Evaluation Scheme:

Evaluation and marks distribution are as follows:

S.N	Activities	Who/Responsibility	Marks
1	OJT Evaluation (should be three evaluation in six months –one evaluation in every two months)	Supervisor of OJT provider	300
2	First and mid- term evaluation	The Training Institute	200
	Total		500

Note:

- Trainees must secure 60 percent marks in each evaluation to pass the course.
- If OJT placement is done in more than one institution, a separate evaluation is required from all institutions.

OJT Evaluation Criteria and Marks Distribution:

- The OJT implementation guideline will be prepared by the CTEVT. The detailed OJT evaluation criteria and marks distribution will be incorporated in the guidelines.
- Representative of CTEVT, Regional offices and CTEVT constituted technical schools will conduct the monitoring & evaluation of OJT at any time during the OJT period.

Annex-1: Evaluation Checklist for Host Organization

S.N.	Title of the weightage	Weightage percentage (%)	Full Marks: 100 each
1.	Attendance- Regularity/punctuality	15 %	15
2.	Discipline-Attitude, Obedient, Dealing, cross-cultural adjustment	15%	15
3.	Field report : quantitative vs. qualitative	50%	50
4.	Presentation Skill-Presentation, group discussion, cross questioning	10%	10
5.	Extra-curricular activities: Game, Music, Interest on social services and personal hygiene	10%	10
	Total	**100%**	**100**

Expert Involved

1. Dr. Balaram Bhatta, Dean, Agriculture and Forestry University
2. Mr. Sanjeeb Bhattarai, Assistant Professor ,Kathmandu Forestry collage
3. Dr. Achyut Tiwari (Botanist), Assistant Professor, Tribhuvan University
4. Dr. Jhamak Bahadur Karki, Vice Principal , Kathmandu Forestry collage
5. Mr. Narayan Rupakheti, Chief Warden, Chitawan National Park
6. Mr. Mahesh Dhungana,Soil Conservation Officer, Department of Forest and Soil Conservation
7. Mr. Raju Bhakta Dhusuju
8. Mr. Arun Sharma Poudyal, Associate Professor, Kathmandu Forestry collage
9. Mr. Shiva Shankar Neupane, Associate Professor, Kathmandu Forestry collage
10. Mr. Balram Poudel, Forest Officer, Department of Forest and Soil Conservation
11. Mr. Nabin Prakash Upadhyaya, Visiting Faculty, Kathmandu Forestry collage
12. Mr. Surendra Adhikari, Assistant Training Officer,Forest Research and Training Center
13. Mr. Santa Kumar Shrestha, Assistant forest officer, Division Forest Office, Kathmandu
14. Mr. Rupak Khatri, Forest Ranger, Division Forest Office, Lalitpur