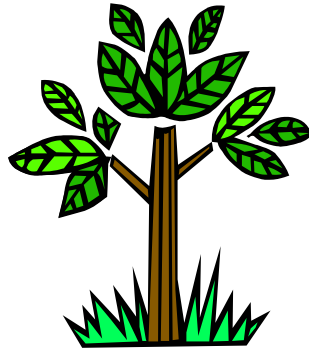


FORESTRY TRAINING CENTRE-KAGELU

NEW SUDAN



**CURRICULUM FOR THE
FORESTRY TECHNICIAN CERTIFICATE**

COURSE

1

JULY 2005

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Our deep appreciations go to the staff of the Secretariat of Agriculture, Forestry and Animal Resources of New Sudan and Dr. George Leju Lugor and the staff of South Sudan Agriculture Revitalization Programme for their active participation during the workshop and subsequent development of the curriculum.

Special delivery of thanks to the staff of the Forestry Training Centre and support staff for the effort they exerted to make the development of the curriculum a success.

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Yei, New Sudan

FOREWORD

(By Dr. George Leju Lugor or by the ANAFE coordinator Prof August Temu)

ABBREVIATIONS AND ACRONYMS

DACUM:	Developing A CurriculuM
SAAR:	Secretariat of Agriculture and Animal resources
SSARP:	South Sudan Agriculture Revitalization Programme
O'Level:	Ordinary level
BoT:	Board of Trustees
FTC:	Forestry Training Centre
GOSS	Government of South Sudan
Mgt:	management
AF:	Agroforestry
FM:	Forest management
FU:	Forest Utilization
CF:	Community Forestry
EF:	Environmental Forestry
FE;	Forestry Extension
Hrs:	Hours

CURRICULUM FOR THE FORESTRY TECHNICIAN CERTIFICATE COURSE

2 Introduction

This curriculum was developed using a process called “*Developing A Curriculum*” or **DACUM**. The process was highly participatory involving a wide range of stakeholders from the forestry and other sectors. A 4-day DACUM workshop held at the Forestry Training Centre-Kagelu drew participants from SAAR, Directorate of Forests, SSARP, Secretariat of Education, training institutions and several individuals working in forest related activities and enterprises.

During the stakeholder workshop, the participants provided the basic information required for developing the curriculum for the Forestry Technician Course. The process involved firstly describing several possible jobs for potential Forestry Technician graduates, and then describing the competencies and skills required by them to perform those jobs successfully. Following the 4-day workshop, the information from the participants were analyzed over several days by lecturers of the training center and staff from the SAAR and Directorate of Forests who finally described the teaching modules as detailed in Appendix 5.

3 Aims of the Forestry Technician Course

The aims of the course are to:

- (i) Contribute to sustainable management and utilization of forest resources in Southern Sudan.
- (ii) Contribute to the improvement and development of forest management systems for Southern Sudan.
- (iii) Contribute to the revitalization of Forestry activities in Southern Sudan for improved socio-economic benefits to the people of Southern Sudan.
- (iv) Strengthen Forestry management capacity of GOSS and privately Funded Non-GOSSal agencies in Southern Sudan.

4 Objectives of the Forestry Technician Course

The objectives of the Forest Technician Course are to:

- (i) Produce well qualified and practically oriented forestry technical staff.
- (ii) Produce graduates with positive attitudes towards the management of forest resources for improved local, national and international benefits.
- (iii) Improve human resource technical capacity to manage forest resources in Southern Sudan.
- (iv) Produce a technician who can use his or her initiative to solve problems that can be seen in the working environment.
- (v) Produce a graduate who is intrinsically motivated and shows enthusiasm for work.
- (vi) Produce a graduate who is business oriented.
- (vii) Produce a graduate who is oriented towards working in rural areas.
- (viii) Produce a graduate who demonstrates sound knowledge and skills in analyzing, planning, implementing, monitoring and evaluation of forestry related activities.
- (ix) Produce a graduate who can act independently, cooperates with supervisor, peers, subordinates, and local communities in the forest sector and other related sectors.

- (x) Produce a graduate who integrates forest practices in various land use practices.
- (xi) Produce a graduate who can advise local communities and other stakeholders in appropriate forest management and utilization practice.

5 Forestry Technician career development

Graduates of the Forestry Technician Certificate will have the skills and competencies to perform a range of jobs in the public and private sectors. The range of positions for which the Forest Technician graduate will be equipped were described at the DACUM workshop and are as follows:

- (i) Nursery Manager
- (ii) Forest Products Marketing Manager
- (iii) Beekeeping Manager
- (iv) Forest Plantation Manager
- (v) Forest Conservation Manager
- (vi) Forest Extension Worker
- (vii) Non-Timber Forest Products Supervisor
- (viii) Carpentry Workshop Manager
- (ix) Saw Mill Manager
- (x) Gum Arabic Supervisor
- (xi) Forest Research Technician
- (xii) Forest Inventory Technician
- (xiii) Logging Supervisor
- (xiv) Natural Forest Manager
- (xv) Agro forestry Supervisor

6 Minimum requirements for enrollment in the course

To be eligible for enrollment in the course, the following criteria shall be applied:

- (i) An applicant should have a minimum of Sudan School Certificate or O Level Certificate with at least a credit in Biology, Mathematics, Geography and English and at least a pass in Physics and Chemistry.
- (ii) Refresher courses shall be offered for staff of the Forestry Department who have stayed longer out of their work due to civil strife. *(Martin, this point is not clear...the refresher courses are not relevant to the Forest Technician course. Suggest you delete this)*
- (iii) A gender balance at all level of training at the training center shall be observed and encouraged. Female applicants shall have advantage by being awarded an extra score determined by the selection committee.

Applications shall be made to the Principal of the KFTC or to the Secretariat of Agriculture, Forestry and Animal Resources. The Forestry Training Centre Academic Selection Committee through the Secretariat of Agriculture, Forestry and Animal Resources shall interview and admit candidates.

7 Content Of The Course

7.1 Academic departments

The course will be taught by staff of six Academic Departments at the KFTC as detailed in Appendix 3. The six Academic Departments are as follows:

- (i) Forest Management
- (ii) Forest Utilisation
- (iii) Community Forestry
- (iv) Environmental Forestry
- (v) Forest Business Management
- (vi) Forest engineering

7.2 Module based course design

The course will be taught in a series of 46 separate modules. The modules have been designed to allow trainees choose modules to meet specific individual and corporate training needs. The 46 modules are described in Appendix 5. 60 contact hours for each module shall be the standard unit of module weight

7.3 Course Distribution

Appendix IV shows the sequence in which the modules will be delivered throughout the course. Modules with contents widely applied in other modules are covered first.

8 Human Resource Requirement

The human resources required to deliver the course are described in Appendix 1. Availability of dedicated and competent staff for the training center is very essential if this curriculum is to be implemented to produce the desired quality of graduates. Appendix 1 shows the current and required human resource for the training center.

9 Teaching Resources

The current status of teaching resources for the Forestry training center is as shown in *Appendix II*. Although the center has procured some few resources, more resources especially those not currently available should be secured through donors and GOSS funding to enable the TC to effectively conduct its training programmes. ([State here the number of staff required](#)).

10 Appraisal Of Student Performance

10.1 Method of student appraisal

Appraisal of students performance shall be done using the following methods:

- (i) Theory tests and assignments
- (ii) Practical skills tests

- (iii) Fieldwork reports
- (iv) Study tour reports
- (v) Case study reports
- (vi) Special projects
- (vii) End of module examinations
- (viii) End of year comprehensive examinations for Year 1 and 2.

Students shall be examined within one week of completion of each module. A number of related modules shall be done through papers at end of year examinations. Assessment of students' performance at the end of the Forestry Technician Course shall be based on:

- (i) Continuous test and assignments 60%
- (ii) Special projects and field reports 20%
- (iii) Comprehensive end of year examinations 20%

10.2 Assessing levels of performance

Each module shall have a pass mark based on continuous assessments and end of module examination. A pass mark shall be 50% for all the modules taught in Year 1 and all the papers in the comprehensive examinations at the end of the year. A student who obtains a total mark less than or equal to 30% of the overall number of modules and papers in examinations for modules she/he fails shall sit for supplementary examinations for the modules she/he failed. A pass mark of 50% shall be given to a student who passes. (?? This is not clear). A student who fails supplementary examinations will be asked to repeat the year. A student who fails more than 30% of the total number of modules and papers in the comprehensive examinations at the end of year 1 will be discontinued.

The same criteria of appraising level of performance shall be followed to assess student's performance at the end of year 2.

10.3 Grading the Certificate

The Forestry Training Center apply the following scores in classifying the certificate:

Score	Class of Certificate
Greater than 80%	First Class
70-79%	Second Class Upper
60-69%	Second Class Lower
50-59%	Pass or Third Class
0-49%	Fail

11 Course Length

The duration of the course shall be two academic years with two semesters in each academic year. Students shall undertake field attachment with various departments to gain field experience and collect data for special projects during vacation periods between semesters.

12 Updating the curriculum

Changes in the curriculum shall be done from time to time in consultation with the examination coordinator and other stakeholders in the forestry sector on recommendation of the Training Center Academic Committee.

The academic committee shall review the curriculum in accordance to sequencing of modules and availability of teaching staff. A more comprehensive evaluation shall be done at the end of each academic year involving stakeholders in the forestry sector.

Changes to the curriculum shall be communicated to all the academic staff and other stakeholders in the forestry sector.

13 Appendix 1 Human resources requirements

TABLE 1 HR REQUIREMENTS FOR EACH MODULE

Modules	Required No. staff	Training Level required				Current staff status at status at the KFTC				Action Needed	Actor
		Masters Degree	Primary degree	Diploma	Certificate	Masters degree	Primary degree	Diploma	Certificate		
Forest management											
Monitoring and evaluation	1		1			1				None	
Record Keeping	1			1		0				Recruit	BOT, FTC
Work planning	1		1			0				Recruit	BOT, FTC
Report writing	1		1			1				None	
Nursery Est. & Mgt.	1		1			1				None	
Seed Collection, procurement	2		1	1		1				Recruit	BOT, FTC
For. Est. and mgt	2		1	1		1				Recruit	BOT, FTC
Forest survey & inventory	2		1	1		1				Recruit	BOT, FTC
Tree spp. identification	1			1			0			Recruit	BOT, FTC
Mensuration	2		1	1		0	0			Recruit	BOT, FTC
Forest Research	1		1				0			Recruit	BOT, FTC
Natural forest management	1		1			0				Recruit	BOT, FTC
Silviculture Operation	2		1	1		1	0			Recruit	BOT, FTC
Forest policy law and regulation	1		1			0				Part Timer	Principal
Human Resource Mgt.	1		1			1				None	
Forest protection	1		1			1				None	
Soil identification & classification	2		1	1		0	0			Recruit	BOT, FTC
Forest management plan	1		1			1				None	

Modules	Required No. staff	Training Level required				Current staff status at status at the KFTC				Action Needed	Actor
		Masters Degree	Primary degree	Diploma	Certificate	Masters degree	Primary degree	Diploma	Certificate		
Forest utilization											
Harvesting of bee products	1		1				0			Recruit	BOT, FTC
Production & processing of NTFPs	1		1				0			Recruit	BOT, FTC
Carpentry and joinery	2		1	1			0	2		Recruit	BOT, FTC
Sawmilling	2		1	1			0	0		Recruit	BOT, FTC
Wood Utilization	1		1				0			Recruit	BOT, FTC
Community Forestry											
Collaborative Forest Management	1		1				0			Recruit	BOT, FTC
Beekeeping	1		1				1				
Agroforestry practices	1		1				1				
Socio economic issues in AF	1		1				1				
Identification & assessment of AF tree species.	1		1				1				
AF components	1						1				
AF pest & diseases	1		1				1				
Socio economic issues in forestry	1		1				0			Recruit	BOT, FTC
Gender Issues	1	1					0			Recruit	BOT, FTC
Forestry Extension	2		1	1			0	0		Recruit	BOT, FTC
Environmental forestry											
Forest Ecology			1				0			Recruit	BOT,FTC
Water shed mgt			1				0			Recruit	BOT,FTC
Soil and water conservation	1		1				0			Recruit	BOT,FTC
Biodiversity Conservation	1		1				0			Recruit	BOT,FTC
Biomass energy conservation	1		1				0			Recruit	BOT,FTC

Modules	Required No. staff	Training Level required				Current staff status at status at the KFTC				Action Needed	Actor
		Masters Degree	Primary degree	Diploma	Certificate	Masters degree	Primary degree	Diploma	Certificate		
Forest Business mgt											
Marketing	1		1				0			Recruit	BOT,FTC
Business mgt.	1			1				0		Recruit	BOT,FTC
Basic economics	1			1				0		Recruit	BOT,FTC
Financial mgt	1			1				0		Recruit	BOT,FTC
Forest Engineering											
Road construction	1							0		Recruit	BOT/FTC
Ergonomics	1			1				0		Recruit	BOT/FTC
Logging	1			1				0		Recruit	BOT/FTC
Forest hand tools & Equipment	1			1				0		Recruit	BOT/FTC

TABLE 2 HUMAN RESOURCE REQUIREMENT SUMMARY BY DEPARTMENT

Department	Qualification			Number of staff	Current status	Action needed	Actor
	Masters Degree	Primary Degree	Diploma				
Forest Management Dept							
Foresters		3	2	5	2	Recruit 2 Dip & 1	
Forest Utilization Dept							
Foresters		2		2	1	Recruit 1	BOT, FTC
Carpenter			1	1	1		
Entomologist (beekeeping)		1		1	0		
Community Forestry Dept							
Agriculturalist		1		1	0	Recruit 1	BOT, FTC
Forester		1		1			BOT, FTC
Social issues BA		1		1		Recruit 1	BOT, FTC
Environmental forestry Dept							
Forester		1			0	Recruit	BOT, FTC
Forest Business mgt							
BA Business		1		1	0	Recruit	BOT, FTC
Forest Engineering Dept							
Forester		1	1	2	0	Recruit 2	BOT/FTC
Total		12	4				

14 Appendix 2. Identification of current resources

TABLE 3 CURRENT RESOURCES AT THE KFTC AND ADDITIONAL RESOURCES REQUIRED TO PROVIDE THE TRAINING COURSE

Required for teaching	Current status	Action needed	Actors
Literature	Few books	Procure more books per module	Principal and heads of department
Laboratory	None	Establish one laboratory and procure equipment and chemicals	GOSS and Donors and principal
Demonstration sawmill	None	One Kara sawmill (simple portable) and accessories	GOSS and Donors and principal
Demonstration farm	None	Establish demonstration farm and training center	GOSS and Donors and principal
Arboretum	None	Establish one for research	Principal/management team
Herbarium	None	Establish one and one botanist	GOSS and Donors and principal
Tree nursery	None	Establish and manage	Principal and management team
Lecture rooms	2	Build more lecture rooms (3)	GOSS and Donors and principal
Audio-visuals	Few	Video screen (3), digital camera (2), video camera (1) and satellite disc (1) and generator (1)	GOSS and Donors and principal
Tools and equipments	None	Procure	GOSS and Donors and principal
Mechanical workshop	Structure available but lacking tools and equipment	Procure	GOSS and Donors and principal
Transport	One contracted land cruiser	Tractor (1) for logging, motorcycles (1) for outreach programmes, students bus (1) for visits and land cruiser (1)	GOSS and Donors and principal
Students accommodation	Foundation for student accommodation but does not exist	Existing foundations be completed	GOSS and Donors and principal
Staff accommodation	Available (5)	Establish (5) more staff quarters	GOSS and Donors and principal
Financial resources	Inadequate resources	Satisfactory funding required	GOSS and Donors
Teaching forest	None	GOSS to allocate the nearest forest for teaching purposes	GOSS
Recreation	None	Rehabilitate swimming pool, establish canteen, common room (1) and courtyard (indoor games and sports ground)	GOSS and Donors
Sports equipments	None	Football, tennis, basketball, volleyball	GOSS and Donor and development

Required for techni	Current status	Action needed	Actors
		badminton, athletes and handball	
Carpentry and joinery	Available but small	Expansion needed and more tools required heavy duty circular saw (1) surface planer and thicknesser (1), tenoner (1), mortise machine (1), band saw (1), sand paper machine (1), lathening machine (1), generator (1; 46KVA)	GOSS and Donors and principal
Computer laboratory	None	Establish the laboratory and procure computers	GOSS and Donors and principal
Dispensary	Structure available	Recruit staff, supply equipments and drugs	GOSS and Donors
Camping and field work equipments	None	Procure	GOSS and Donors

15 Appendix 3. Distribution of modules by Departments

1.0 FM 100 forest management

Code and department	Code and module	Contact hours
FM 100 Forest management	FM 101 Monitoring and Evaluation	14
	FM102 Record keeping	14
	FM103 Work planning	19
	FM 104 Report writing	14
	FM 105 Nursery establishment and management	92
	FM 106 Seed collection, procurement and management	34
	FM 107 Forest plantation establishment and management	92
	FM 108 Forest survey and Inventory	80
	FM 109 Tree species identification	33
	FM 110 Mensuration	49
	FM 111 Forest research	78
	FM 112 Natural forest management	92
	FM 113 Silvicultural operations	80
	FM 114 Forest policy, law and regulation	38
	FM 115 Human resource management	48
	FM 116 Forest protection	49
	FM 117 Soil identification and classification	33
	FM 118 Forest management plan	51

1.1 FU 200 Forest utilization

Code and department	Code and module	Contact hours
FU200 Forest utilization	FU 201 Harvesting and processing of products	34
	FU 202 Production and processing of Non-Timber Forest Products	60

Code and department	Code and module	Contact hours
	FU 203 Carpentry and Joinery	92
	FU 204 Saw milling	49
	FU 205 Wood utilization	57

1.2 CF300 Community Forestry

Code and department	Code and module	Contact hours
CF 300 Community forestry	CF 301 Beekeeping	80
	CF 302 Collaborative forest man	49
	CF 303 Agroforestry practices	91
	CF 304 Socio-economic issues i Agroforestry	19
	CF 305 Identification and Asses Agroforestry trees	19
	CF 306 Agroforestry componen	33
	CF 307 Agroforestry pest and di	19
	CF 308 Socio-economic issues i	19
	CF 309 Gender issues	33
	CF 310 Forestry extension	72

1.3 EF 400 Environmental Forestry

Code and department	Code and module	Contact hours
EF 400 Environmental Forestry	EF 401 Forest ecology	36
	EF 402 Watershed management	48
	EF 403 Soil and water conservat	48
	EF 404 Biodiversity conservatio	34
	EF 405 Biomass energy conserv	34

1.4 Fbm 500 Forest business management

Code and department	Code and module	Contact hours
FBM500 Forest business management	FBM 501 Marketing	24
	FBM 502 Business management	30
	FBM 503 Basic economics	24

	FBM 504 Financial management	18
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1.5 FE 600 FOREST ENGINEERING

Code and department	Code and module	Contact hours
FE 600 Forest engineering	FE 601 Road construction	19
	FE 602 Ergonomics	48
	FE 603 Logging	48
	FE 604 Forest hand tools and eq	33

16 APPENDIX 4. Distribution of modules in the forestry technician course

Teaching se	First Semester	Second Semester	Third Semester	Fourth semester
1	EF 405 Biomass energy conservat	FM 116 Forest protection 49 Hrs	FU 203 Carpentry and joinery 92	CF 302 Collaborative forest manageme
2	FM 105 Nursery establishment and management 92 Hrs	FM 109 Tree species identification	FE 602 Ergonomics 48 Hrs	CF 301 Beekeeping 80 Hrs
3	FM 106 seed collection, procurement management 34 Hrs	CF 309 Gender issues 33 Hrs	FM 112 Natural forest management	FU 201 Harvesting and processing of b products 34 Hrs
4	CF 310 Forest extension 72 Hrs	CF 306 Agroforestry components 3	FM 102 Record keeping 14 Hrs	FU 204 Saw milling 49 Hrs
5	FM 107 Plantation establishment and management 92 Hrs	CF 308 Socio-economic issues in fo Hrs	CF 304 Socio-economic issues in Agroforestry 19 Hrs	FE 601 Road construction 19 Hrs
6	FM 113 Silvicultural operations 8	FM 104 Report writing 14 Hrs	FM 108 Forestry survey and inven Hrs	FM 111 Forest research 72 Hrs
7	FM 117 Soil identification and cla 33 Hrs	EF 403 Soil and water conservation	CF 303 Agroforestry practices 91	FU 202 Production and processing of N Timber Forest Products 60 Hrs
8	EF 404 Biodiversity conservation	FM 103 Work planning 19 Hrs	EF 402 Watershed management 4	FBM 502 Business management 30 Hrs
9	FM 110 Mensuration 49 Hrs	FM 115 Human resource managem	EF 401 Forest ecology 36 Hrs	FM 118 Forest management plan 51 Hr
10		FU 205 Wood utilization 57 Hrs		FM 114 Forest policy, law and regulatio
11		FBM 501 Marketing 24 Hrs		FM 101 Monitoring and evaluation 14 H
12		CF 307 Agroforestry pests and dise Hrs		FBM 504 Financial management 18 Hr
13		CF 305 Identification and assessme Agroforestry trees 19 Hrs		
14		FE 604 Forest hand tools and equip		

Teaching se	First Semester	Second Semester	Third Semester	Fourth semester
		Hrs		
15		FE 603 Logging 48 Hrs		
16		FBM 503 Basic economics 24 Hrs		
Total time	520	520	520	520

17 Appendix 5. 46 Course Modules

17.1 Department: FM100 Forest Management

17.1.1 Module: FM101 Monitoring and evaluation

Module objectives: On completion of the module the student should be able to:

Develop suitable criteria and indicators for monitoring and evaluation

Identify, collect and analyze data about progress of a piece of work/project

Advise and recommend for suitable changes for a piece of work/project

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Explain clearly monitoring and evaluation and its importance in Forestry	Definition of monitoring and evaluation interventions Importance of monitoring and evaluation in forestry interventions Difference between monitoring and evaluation	2Hrs	0Hrs	
Monitoring and Evaluation	Assess the activities involved in forestry projects Actively participate in national forestry programme. Use effectively various methods of forestry programmes	Methods of assessment Participatory procedures in national forestry programs	3Hrs	3Hrs	
Evaluation	Clearly explain the role of evaluation in forestry Properly use appropriate tools to evaluate forestry programs	Evaluation methods Conformity with original plan Types of evaluation	2Hrs	3Hrs	
Assessment			2Hrs		

Department: FM100 Forest Management

17.1.2 Module: FM102 Record keeping

Module objectives: On completion of the module the student should be able to:

Properly keep official records

Manage office records effectively

Interpret office records clearly

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to records	Clearly explain record keeping Clearly interpret data Properly enter records	Definition of record keeping Importance of record keeping	2 Hrs	0	
Record keeping	Prepare different types of records Submit records timely	Types of records Preparation and submission of records	4 Hrs	6 Hrs	
Assessment			2Hrs	0	

Department: FM100 Forest management

17.1.3 Module: FM103 Work planning

Module objectives: On completion of the module the student should be able to:

Draw appropriate work plan for required forestry programme

Identify suitable resources required for planning

Schedule forestry activities

Topic	Learning objectives The student should be able to:	Sub-topics	Time (Hrs)		Remarks
			Theory	Practical	
Introduction to work	Explain work plan	Definition of Workplan Importance of Work plan	2Hrs	0	
Work plan	Prepare a good Workplan Assess resources required for Work	Types of Work plan Work routines and calendar of events Preparation of annual Work plan Review of annual work plans and progress	6Hrs	9Hrs	
Assessment			2Hrs	0	

Department: FM 100: Forest management

17.1.4 Module: FM 104 Report writing

Modules objectives: On completion of the module the student should be able to:

Develop a good format for different reports

Schedule report time

Practice good reporting skills

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to report writing	<p>Explain the meaning of report writing skill</p> <p>Explain the importance of report writing</p>	<p>Definition of report writing</p> <p>Importance of report writing</p>	2Hrs	0	
Report writing	<p>Clearly write good reports</p> <p>Apply appropriate styles in preparing variety of reports</p>	<p>Types of reports and their formats</p> <p>Styles of report writing</p>	4Hrs	6Hrs	Training Centre as orga
Assessment			2Hrs	0	

Department: FM 100: Forest management

17.1.5 Module: FM 105: Nursery establishment and management

Modules objectives: on completion of the module the student should be able to:

Identify suitable planting materials for nursery establishment

Apply good principles and practices in seed collection and management

Establish a tree nursery

Advise communities on proper nursery practice

Assist communities in nursery establishment and management

Topic	Learning objectives: The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to Nurser	Explain principles of nursery Explain the importance of nursery	Definition of tree nurseries Importance of tree nurseries	2Hrs	0	
Nursery establishment	Identify a suitable nursery site Construct nursery bed and shade Properly manage tree nursery Apply necessary requirement nec establishment of tree nurseries	Identification of nursery sites Establishment of tree nursery Management of tree nursery Necessary requirements necessary for estab of tree nursery	10Hrs	32Hrs	
Nursery operations	Calculate nursery requirements Raise seedlings in different conta Raise seedlings by vegetative me	Calculation of nursery requirements Raising seedling in a nursery Raising seedlings vegetatively	10Hrs	35Hrs	
Assessment			3Hrs	0	

Department: FM100 Forest Management

17.1.6 Module: FM106 Seed collection, procurement and management

Module objectives: On completion of the module the student should be able to:

Identify suitable seeds from different seed sources

Collect good seeds from right sources

Apply correct principles and practices in seed collection and management

Advise farmers on collection of quality seeds

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to seed procurement and management.	Explain the importance of seed collection, procurement and management	Importance of seed collection procurement and management.	1Hrs	0	
Seed collection	Collect quality seeds Identify the right seed trees Advise farmers on proper collection of seeds	Seed quality Seed collection method Seed sources	3Hrs	5Hrs	
Seed procurement	Procure quality seeds Advise farmers in procuring good seeds from seed centers with minimum work force	Seed supply	2Hrs	0	
Seed management	Apply appropriate techniques to store seeds Carry out treatment germination tests	Techniques of storing seeds Germination test	5Hrs	15Hrs	
Assessment			2Hrs	1Hrs	

Department: FM100 Forest management

17.1.7 Module: FM107 Forest plantation establishment and management

Module objectives: On completion of the module the student should be able to:

Carry out appropriate silvicultural practices in plantation forests

Plan, establish and manage forest plantations as business enterprise

Advise communities on establishment and management of private plantations

Topic	Learning Objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to forest establishment and management.	Explain the procedures in forest p establishment and management	Importance of forest plantation establishm Management.	6Hrs	0	
Preparation For plant	Clear ground for planting Identify suitable site for planting Use appropriate tools for land pre Employ good transplanting of see Carry out beating up	Site selection Ground clearing Tools and equipment for ground clearing Methods of transplanting seedlings	5Hrs	30Hrs	
Weed control	Apply good tending practice Select appropriate tending tools a equipment	Tending practices Tending tools and equipments	2Hrs	3Hrs	
Pruning and thinning	Prune and thin forest plantations Assist communities in pruning an community plantations Explain the reason for pruning an	Pruning and thinning techniques Purpose of pruning and thinning Timing pruning and thinning in forest pla Use of products of pruning and thinning	8Hrs	20Hrs	
Plantations in difficu	Identify water logged and semi-ar	Establishment of forest plantations in diff			

Topic	Learning Objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
	Determine suitable silvicultural o for difficult sites		3Hrs	4Hrs	
Amenity trees and pl	Identify suitable tree and plant sp amenity Raise amenity trees and plants Establish and manage amenity tre plants	Amenity tree and plant species Establishment and management of amenit and plants	2Hrs	3Hrs	
Assessment			3Hrs	0	

Department: FM 100: Forest management

17.1.8 Module: FM 108 Forest survey and inventory

Modules objectives: On completion of the module the student should be able to:

Develop and interpret vegetation maps

Correctly employ survey and inventory techniques

Collect accurate data

Analyze data

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Land surveying	Conduct survey of forest and forest Apply appropriate skills in leveling chain surveying Use tools and equipment accurately	Define land surveying Explain the importance of surveying Chain surveying Compass and chain surveying Area determination Maps and plans Coordinates Map reading and interpretation	10Hrs	25Hrs	
Inventory	Plan and design inventory Conduct inventory successfully Apply statistics in analysis of data Rightfully use inventory tools and equipment	Inventory tools and equipment Sampling Inventory report	10Hrs	30Hrs	
Assessment			2Hrs	3Hrs	

Department: FM 100: Forest management

17.1.9 Module: FM 109 Forest Species identification

Modules objectives: On completion of the module the student should be able to:

Identify tree species of Southern Sudan

Assess the economic importance of tree species

Classify trees and species according to different ecological zones

Assist communities on the importance of tree identification

Collect, prepare and preserve plant specimen

Conduct phenological studies and use the knowledge to raise local plants species

Topic	Learning objectives The student be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Phenology of trees	Describe morphology of trees Explain the importance of morphology Distinguish the seasonal behavior Determine the seed age properly Determine the season for leaf fall	Definition of tree morphology Importance of morphology Seasonal behavior of trees Seed years Season of leaf fall	3Hrs	8Hrs	
Plant taxonomy	Classify plant according to their families, genus, species and others	Plant classification	5Hrs	0	
Herbarium technique	Use a herbarium in identifying trees Collect specimens Preserve and store specimen	Importance of herbaria Collection of specimen Preservation and storage of specimens	5Hrs	10Hrs	
Assessment			2Hrs	0	

Department: FM 100: Forest management

17.1.10 Module: FM 110 Mensuration

Modules objectives: On completion of the module the student should be able to:

Apply suitable techniques to measure/estimate forest produce

Use suitable techniques in conducting stock survey of different types of forest

Topic	Learning objectives The student be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to Mensuration	Explain clearly the importance of Mensuration Correctly use mathematical concepts in forest measurement	Definition of forest Mensuration Application of metric and systems to forest mgt Importance of accurate measurement	4Hrs		
Tree and log measurement	Correctly apply different formulae in computations Properly measure trees and logs Calculate royalties	Tree and log measurement Calculation of volumes tree and log Taking dimension of logs Common errors in log measurement Tools and equipment used in log measurement Recording measurement	7Hrs	18Hrs	
Measurement of non forest product	Identify and measure NTFPs	Types of NTFPs Measurement and recording of wood products Measurement and recording wood products Measurement of non wood forest products	5Hrs	13Hrs	
Assessment			2Hrs	0	

Department: FM 100: Forest management

17.1.11 Module: FM 111 Forest Research

Modules objectives: On completion of the module the student should be able to:

Correctly use instructions in research plans

Assist researchers to establish and maintain research plots

Link research activities to extension and other related files

Communicate research needs to formal researchers

Topic	Learning objectives The student s able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to forest research	Clearly define forest research Explain the importance of forest research	Definition of forest research and terms Importance of forest research	3Hrs	0	
Basic genetics	Collect the genetic material for research Explain natural evaluation Apply the appropriate method of plant improvement	Genetics material and inheritance Natural selection and evaluation Plant improvement	10Hrs	15Hrs	
Research silviculture research	Carryout formal and informal research Establish herbarium Create species trial plots Assess result from research plots	Formal and informal research arboretum Species trial plots Assessing research plots	8Hrs	20Hrs	
Agroforestry Research	Apply different Participatory learning action tools Must set out demonstration plot Manage the site on farm plots	Participatory learning and action tools Management of the demonstration sites and on-farm on Agro-Forestry	4Hrs	15Hrs	
Assessment			3Hrs	0	

DEPARTMENT: FM 100: FOREST MANAGEMENT

17.1.12 Module: FM 112 Natural Forest Management

Modules objectives: On completion of the module the student should be able to:

Apply appropriate practices of natural forest management in Southern Sudan

Use appropriate management practices of different natural forest types

Properly plan and manage all types of natural forests sustainably

Create awareness on allocation and management of all types of natural forest in Southern Sudan

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to Natural Forest management	<p>Clearly explain the variety of terms forests management already</p> <p>Describe distribution of natural forests</p> <p>Explain the Introductory, national and community importance of natural forests</p> <p>Apply appropriate criteria and indicators for sustainable natural forest management</p>	<p>Definition of terms</p> <p>Distribution of Natural forests woodland of Southern Sudan</p> <p>Criteria and indicators for sustainable management of natural forests</p>	3Hrs	0	
Plants of the different ecozones	<p>Clearly explain the characteristics of plants in different ecozones</p> <p>Clearly differentiate yields from different ecozones</p>	<p>Characteristics of plants in different ecozones</p> <p>Yield from different ecozones</p> <p>Natural regeneration in different ecozones</p>	7Hrs	4Hrs	

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Silvicultural techniques in natural forests	Conduct exploratory inventory Assist inducing natural regeneration Apply appropriate felling methods Regulate felling in a natural forest Repair damage caused during felling Conduct enrichment planting Apply systematic inventories Determine felling cycles	Exploratory inventory Regeneration inducement Felling control and damage repair Enrichment planting Integrated systematic inventories Felling cycles	10Hrs	30Hrs	
Silviculture in different ecozones	Articulate wider view of management in different ecozones Consider appropriate method in developing plantations in each ecozone	General consideration Limited burning Plantation development	10Hrs	0	
Management of primary community natural forests and woodlands	Develop sound management plans for primary forests Carry out appropriate management practices in natural forests Apply appropriate harvesting and regeneration systems	Management planning Management practices in natural forests Harvesting and regeneration systems	5Hrs	20Hrs	
Assessment			3Hrs	0	

Department: FM 100: Forest management

17.1.13 Module: FM 113 Forest Policy laws and regulations

Modules objectives: On completion of the module the student should be able to:

Implement forest policy at grass root level

Correctly interpret forest related policies and logisticians

Enforce forest laws

Educate the public on forest policy and laws

Apply forest policies in relation to other land policies

State clearly the various powers often enforced in the forestry Act

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to forest policy and laws	Clearly define the terms in forest policy and laws State the relationship between law and policy Link forest policy to other sectoral policies	Definition of term in forest policy and laws Coordination with other sectoral policies Relationship between policy and law	2Hrs	0	
Forest policy	Define forest policy Clearly state the values of forest Distinguish categories of forest Must be able to contribute to development of forest policy Must be able to interpret forest laws, policies and regulation	Definition of forest policy Values of the forest Categories of forest Development of forest policy Current policy in South Sudan	10Hrs	0	

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Forest Laws and re	Definition of law Interpret the current forest law of Sudan Identify types of legislation and how they relate to forests	Definition of law Introduction to current law of Southern Sudan Types of legislations Principle legislation Subsidiary legislation Delegate legislation	6Hrs	0	
Forest Act	Define and clearly interpret the forest Act Clearly understand and implement ministerial orders effectively Properly explain excision/addition of forests Effectively apply the stipulated laws and regulations? Apply proper legal proceedings and court procedures	Definition and interpretation of the forest Act Ministerial/powers Excision and addition of forests Controls and regulations Power of enforcement officers Methods of confiscation and arresting Subsidiary legislation Legal proceeding and court procedures	7Hrs	10Hrs	
Assessment			3Hrs	0	

Department: FM 100: Forest management

17.1.14 Module: FM 114 Human resource management

Modules objectives: On completion of the module the student should be able to:

Manage human resource effectively for efficient production

Implement publicity programmes

Follow correct procedures of managing office at work place

Manage resources for human resource development effectively

Coordinate activities with other related institutions of human resource development

Topic	Learning objectives	Sub-topics	Time		Remarks
	The student should be able to:		Theory	Practical	

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Human Resources Management	Specify the terms of employment Explain the role and powers of personnel work positions Understand the role of the Directorate of Forestry on personnel management Demonstrate good leadership skills Demonstrate good public relations	Personnel division Duties of personnel officer Appointment procedures and conditions Wages and salaries Scheme of service for forestry officers Disciplinary procedures The power of the public service Commission on personnel recruitment matters Terminal benefits Staffing and recruitment Human resource planning Selection of human resources Development through training of workers during recruitment Leadership skills Importance of human resource management	19Hrs	29Hrs	
Assessment					

Department: FM 100: Forest management

17.1.15 Module: FM 115 Forest Protection

Modules objectives: On completion of the module the student should be able to:

Conduct simple forest related environmental impact assessment

Assess the extent of all forms of damage on forest resources

Adopt appropriate measures to protect forest resources against all forms of damage

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Protection from Human activities	Protect against human encroachment Guard against illicit cutting/harvesting Warn/arrest license defaulters Applying appropriate legal procedures against defaulters Create good public relations Create public awareness on the importance of forest protection	Encroachment Illegal felling/harvesting of trees Unlawful damage of trees Licensee offences Legal procedures Public relations Public education and sensitization	4Hrs	8Hrs	
Protection against animals, plants and other harmful agents	Effectively prevent damage by animals Carefully remove harmful plants Apply appropriate methods to minimize atmospheric damage	Domestic and wild animals Atmospheric damage	7Hrs	3Hrs	

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Fire protection	Clearly explain the causes of fire Describe the damage of fires Apply appropriate measures to fire protection Use appropriate measures to suppress fire Carefully apply fire control measures as part of forest management Create awareness on dangers of fire	Causes of fire Danger of fire Types of fires Prevention of fire Methods of fire suppression Fire as mgt tool Educate and sensitize communities on the dangers of fire	6Hrs	3Hrs	
Forest pathology	Clearly identify forest diseases Effectively prevent and control forest diseases	Forest diseases Prevention and control of forest diseases	5Hrs	2Hrs	
Forest entomology	Explain clearly the biology of forest insects Outline the importance of insects in the forest Apply appropriate preventive and control measures against insects Use effective integrated pest management practices	Biology of forest insects Importance of insects in forestry Prevention and control of insects Integrated pest management	6Hrs	2Hrs	
Assessment			2Hrs	0	

Department: FM 100: Forest management

17.1.16 Module: FM 116 Soil identification and classification

Modules objectives: On completion of the module the student should be able to:

Identify common soil type

Classify the various soil types

To relate plant growth to various soil type

Describe soil profile accurately

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Intro Soil S	To define and explain various terms in soil science	Definition of soil	2Hrs	0	
Soil f	Describe clearly the processes involved in soil formation Explain clearly factors on which soil formation	The processes of soil formation Factors in soil formation	5Hrs	6Hrs	
Soil p	To recognize various properties of soil	Physical properties Chemical properties Biological properties	6Hrs	3Hrs	
Soil classi	To identify and classify soils into various soil types	Soil types Soil maps	4Hrs	5Hrs	
Asses			2Hrs	0Hrs	

17.2 DEPARTMENT: FU 200 FOREST UTILIZATION

17.2.1 Module: FU 201 Harvesting and processing of bee products (34Hrs)

Module objectives: on completion of the module the student should be able to:

Advise on the market quality of bee products

Ensure proper harvesting of bee products

Maintain high quality of bee products

Process bee products

Ensure proper storage of bee products

Topics	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to bee product	Relate harvesting and processing products to forest utilization	Definition of bee products Types of bee products Relevance to forest sector	2Hrs		Lecture notes Literature in center library
Harvesting bee products	Describe the harvesting procedure of bee products Harvest bee products	Methods of harvesting honey Bee venom Royal jelly	4Hrs	6Hrs	
Grading and quality assurance	Identify different grades of honey	Guidelines to grading honey Grades of honey	2Hrs	4Hrs	Guideline for grading be got products companies
Storage and processing of bee products	Describe the methods of storage of bee products Store bee products Describe the processing procedure of various bee products	Methods of storage of bee products Processing procedures of bee products Types of packaging of bee products	6Hrs	8Hrs	Apiary to be established at the Forestry Training centre Visit other apiaries outside K forestry training centre

Topics	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
	Process bee products				
Assessment		Groups work during practical Final written end of module examination	2Hrs		

DEPARTMENT: FU 200 FOREST UTILIZATION

17.2.2 Module: FU 202 Production and processing of Non-timber Forest Products (60Hrs)

Module objectives: on completion of the module the student should be able to

Estimate the volume of non-timber forest products

Assess resource for production and processing of non-timber forest products

Promote conservation of non-timber forest product species

Supervise the production and processing of non-timber forest products to the required set standard

Assess the value of non-timber forest products in the development process of a community

Propagate and manage common non-timber forest products

Use appropriate knowledge systems to develop non-timber forest products

Advise communities on marketing of non-timber forest products

Topics	Learning objectives The students should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to timber forest products	Relate the production and processing of non-timber forest products to wood utilization	Definition of production and processing Types of non-timber forest products Relevance to forest sector	4Hrs	0	
Medicinal plants	Identify and locate medicinal plants Propagate medicinal plants Harvest medicinal plants	Taxonomy, location and distribution Uses of plant medicine Propagation and management Harvesting and processing	8Hrs	8Hrs	
Food plants	Identify and locate food plants Propagate food plants Harvest food plants	Taxonomy, location and distribution Propagation and management Processing and marketing	8Hrs	8Hrs	
Cottage industries	Identify and site cottage industry plants Establish and manage cottage industry plants Process and market cottage non-timber forest products as cottage industry	Types of cottage industries Establishment and management Processing and marketing	10Hrs	10Hrs	
Assessments		Practical work End of module examination	4Hrs	0	

DEPARTMENT: FU 200 FOREST UTILIZATION

17.2.3 Module: FU 203 Carpentry and Joinery (92Hrs)

Module objectives: on completion of the module the student should be able to:

Carry out basic maintenance work on forest station structures and furniture

Use appropriate techniques in wood management

Topics	Learning objectives The students should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to and joinery	Relate carpentry and joinery to forest utilization	Definition and the scope Relevance of carpentry and joinery to forestry sector	2Hrs	0	Explain difference between carpentry and joinery
Carpentry	Apply safety precautions Construct various types of joints Apply technical drawing Construct roofs and fittings	Safety precautions Types of joints Technical drawing Roofs and fittings	4Hrs	20Hrs	Technical drawing include designing Library books
Joinery	Apply safety precautions Construct various types of joints Apply technical drawing	Safety precautions Types of joints Technical drawing	6Hrs	30Hrs	Furniture design and construction Library books
Wood carving	Apply safety precautions Differentiate types of wood carving Apply methods of wood carving Produce and market wood carving	Safety precaution Types of wood carving Methods of wood carving Production and market of wood carving	3Hrs	10Hrs	
Wood engraving	Apply safety precaution Differentiate types of wood engraving	Safety precautions Types of wood engraving	3Hrs	10Hrs	Library books

Topics	Learning objectives The students should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
	Apply methods of wood engraving Produce and market wood engravings	Methods of wood engraving Production and marketing of wood en			
Assessment		Practical work End of module examination	4Hrs	0	

DEPARTMENT: FU 200 FOREST UTILIZATION

17.2.4 Module: FU 204 Sawmilling (49Hrs)

Module objectives: on completion of the module the student should be able to:

Plan sawmilling as a business

Establish sawmills as a business

Manage sawmill as a business

Carry out repair of basic machines and tools in sawmilling

Advise and train entrepreneurs on efficient sawmilling

Explain the structures and properties of wood and its derivatives

Topics	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to sawmilling	Define and Relate sawmilling to forest utilization	Definition and scope History of sawmilling in Sudan	2Hrs	0	
Structure and of wood	Explain wood anatomy Determine the strength properties of wood	Wood anatomy Strength properties of wood	2Hrs	2Hrs	
Sawmilling	Conduct sawmill layout Organize requirement and arrangement of mill yard Ensure log protection Layout machinery Maintain saw and sawmill machinery Use different methods of sawing and produce	Sawmill layout Requirements and arrangement of log yard Log protection General sawmill machinery Maintenance of saw and sawmill machinery Methods of sawing and types of produces	8Hrs	14Hrs	
Timber seasoning	Describe timber seasoning Conduct stacking	Introduction to wood seasoning Stacking	6Hrs	12Hrs	

Topics	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
	Apply different methods of seasoning Determine shrinkage during seasoning Explain drying defects Determine moisture content for various uses	Methods of seasoning Shrinkage during seasoning Drying defects Moisture content for various uses			
Assessment		Practical work End of module examination	3Hrs	0	

DEPARTMENT: FU 200 FOREST UTILIZATION

17.2.5 Module: FU 204 Wood utilization

Module objectives: on completion of the module the student should be able to:

Apply timber grading and dispatch

Carry out wood preservation

Describe secondary wood products

Identify major wood based industries

Topics	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction to utilization	Relate wood utilization to forest utilization	Definition and scope	2Hrs	0	
Timber grading and dispatch	Apply rules for grading timber Determine timber defects Re-measure and dispatch timber Safely load and transport timber	Rules of grading Timber defects Re-measuring for dispatch Loading and transport	5Hrs	8Hrs	
Wood preservation	Describe wood preservation Determine quality of good preservatives Mention various types of preservatives Apply different method of wood treatment	Introduction to wood preservation Qualities of good preservatives Types of preservatives Methods of treatments	4Hrs	9Hrs	
Secondary wood	Differentiate types of wood products Apply different methods of production Mention qualities and uses Describe qualities for their raw materials	Types of secondary wood products Methods of production Qualities of uses Qualities for their raw materials	4Hrs	8Hrs	

Topics	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Major wood using industries	Explain the role of wood using industries in utilization	Building industry Furniture industry General manufacturing industry Packaging Transport Transmission poles Matches	3Hrs	10Hrs	
Assessments		Assignment, practical work and the module examination	4Hrs	0	

17.3 Department: Environmental Forestry EF 400

17.3.1 Module: EF 401 Forest Ecology (36HRS)

Modules objectives: On completion of the module the student should be able to:

Distinguish difference between vegetation types

Identify both positive and negative Human Influence on Forest ecosystem

Identify and explain the plants – plants and plants animals’ interaction

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Forest ecology	To identify vegetation types To explain the positive and negative inter between plants and plants and plants and Explain plants and animal behaviour Explain events and principles of Succession Collect, prepare and preserve plants	Vegetation Classification and types Interactions in forest ecosystem Plant and animal behaviour in forest ec Succession Preparation of forest specimens	7 Hrs	12 Hrs	Practicals will be field trips
Human influence on ecosystem	Impact of human on forest ecosystem	Human influence on forest ecosystem	5 Hrs	10 Hrs	
Assessment			2 Hrs	0	

Department: Environmental Forestry EF 400

17.3.2 Module: EF 402 Watershed Management (48hrs)

Modules objectives: On completion of the module the student should be able to:

Educate people about watershed management practice areas

Carryout water harvesting practices

Integrate watershed management and other human activities like Agricultural activities

Topic	Learning objectives The student be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Explain various terms in watershed	Introduction to watershed management, termin and scope	1hr		
Hydrological c	Identify and explain the various hy processes and cycle	Hydrological cycle and components	2 hrs		
Watershed mgt	Recommend good watershed mana practices	Water conservation on crop lands Water harvesting practices	5hrs	10Hrs	
Management o	Explain good wetland management	Establishment of streams, rivers banks Wetland management	6hrs	19Hrs	
Assessment			3 hrs	0	

Department: Environmental Forestry EF 400

17.3.3 Module: EF 403 Soil and water conservation

Modules objectives: On completion of the module the student should be able to:

Apply appropriate soil and water conservation practices.

Identify soil types that conserve water

Develop strategies that regulate detrimental human activities in soil and water conservation

Topic	Learning objectives The student will be able to: The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Define the various terms in soil and water conservation	Definition and scope	1hr		Is related to Biodiversity conservation and forest ecology, therefore must be taught in the same semester and aspects of Agroforestry and extension, so must be taught also before extension and Agroforestry
Soil properties and conservation	Identify soil types in relation to soil conservation/lineation	Soil formation Soil structure and texture Soil composition Human practices that affect soil and water conservation	9hrs	19hrs	
Human impact on soil and water conservation	Identify human activities that affect soil and water conservation	Human practices that support soil and water conservation	6hrs	10 hrs	
	Assessment		3hrs	0	

Department: Environmental Forestry EF 400

17.3.4 Module: EF 404 Biodiversity Conservation (34)

Modules objectives: On completion of the module the student should be able to:

Protect Biodiversity.

Explain the value of biodiversity

Manage Biodiversity effectively and sustainably

Protect endangered SPP and identify them

Topic	Learning objectives The student should be able to	Sub-topic	Time		Remarks
			Theory	Practical	
Introduction	Define various terms in biodiversity	Definition of terms Species richness Species index	1hr		This module uses most skill knowledge of forest ecology watershed mgt and soil and confirmation, therefore must after. This module also involves knowledge of inventory and protection laws and regulation so must after above
Importance of biodiversity conservation	Understand the need for biodiversity conservation	Products of biodiversity Uses of biodiversity Importance of biodiversity	1hr		
Sustainable Biodiversity	Regulate human need in relation to biodiversity	Influence of Man On Biodiversity Conservation strategies	2hrs	5hrs Field trip	
Biodiversity	Sample biodiversity composition	Determine Species composition and richness	3hrs	10hrs Practicals	
Royalty and endemism	Identify and conserve species	Royalty and endemism	1hr		
Conservation and regulation	Identify endangered species	International regulation convention and local regulation	2hrs		

Topic	Learning objectives The student should be able to	Sub-topic	Time		Remarks
			Theory	Practical	
Eco-tourism	Protectively generate revenue	Definition of eco-tourism Importance of eco-tourism Set up of eco-tourism centres	2hrs	5hrs Field trip	
	Assessment		2		

Department: Environmental Forestry EF 400

17.3.5 Module: EF 405 Biomass energy conservation (34)

Modules objectives: On completion of the module the student should be able to:

Produce biogas for use.

Market fuel wood

Build up solar panel locally

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	To understand biomass energy	Definitions Importance Energy demand	1hr		
Fuel wood use	Identify fuelwood resources harvest, process, handle and market	Sources of fuelwood Harvesting and preparation	2hrs		Linked to logging
Biomass conversion	Combust and produce products of conversion of biomass efficiently	Sources of wood Preparation of material Types of combustion kiln By product Preparation and uses	3hrs	7hrs	Practicals will be done by demonstration
Energy efficient techniques	Extend energy conserving technology and demonstrate	Socio-economic issues in energy efficient technology Manufacturing efficient and marketing of improved	3hrs	6hrs	Practicals will be done by demonstration
Alternative energy source	Produce and use alternative energy sources	Solar energy Micro-hydro technology Production of biogas	1hrs	3hrs	Practicals will be field trips
Assessment			2Hrs	0	

17.4 Department: Forest Business Management FBM 500

17.4.1 Module: FBM 501: Marketing (24)

Modules objectives: On completion of the module the student should be able to:

Market produce competitively

Collect relevant data of marketing for companies

Organize resources for marketing

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Get acquainted with various markets	Definition and scope of marketing Importance and challenge of marketing	1hr		This module is closely related to business marketing therefore be taught before
Basic marketing strategies	Acquire and select competitive marketing skills and strategies	Display of market items Value addition Discounts	1hr		
Market survey collection	Carryout market survey and compile charge strategies	Sampling in market survey Necessary marketing information Data recording and presentation	3hrs	10hrs	Practical will be field visits
Sole promotion	Ensure marketing potential of his/her	Advertisement Packaging Auctioning	2hrs	5hrs	
Procurement	Sale and purchase in markets which contracts	Principles of procurement Contracts of procurements Documentation in procurement (Storekeeper)	1hr	0	

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
	Assessment			1hr	0

Department: Forest Business Management FBM 500

17.4.2 Module: FBM 502: Business Management (30)

Modules objectives: On completion of the module the student should be able to:

Use books of accounts

Interpret account information data

Allocate resources and plan human resource in an organization

Develop team spirit in an organization

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Understand basic business language	Definition and scope Aspects of business management	1hr		This has close link to financial mgt so must be after
Project planning	Allocate resources and budget	Project life spans Participatory project planning Resources allocation and budgeting Sources of resources	4hrs	5hrs	Practical will be developing project plan for s data
Staff development	Understand the need and principles of t	Group formation Remuneration Motivation Career development	2hrs		Field trips
Cash flow in firm cash flow and financial analysis	Identify point of expenditures and revenues Predict the progress and profitability of project and select options	Expenditure Revenues Organization charts Profit analysis Selection of projects	4hrs	11hrs	Field trips Practicals Analysis secondary data to project profits

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Monitoring and e	Forecast the success and failure of the p	Areas of monitoring Indicators Strategies	1 hr		Analysis result to select different options
Assessment			1 hr		

Department: Forest Business Management FBM 500

17.4.3 Module: FBM 503: Basic economics (24hrs)

Modules objectives: On completion of the module the student should be able to:

Explain and understand price floatation in markets

Identify dependent and independent factors affecting the production in a giver firm

Compare different types of trade and cases of inflation

Topic	Learning objectives The student should be ab	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Understand terms and importance of finance	Definition of terms Why learn economics Scope and Principles of economics	1hr		This module is closely related to marke must be taught before marketing
Production and production fac	Identify factors of production that affect product given time	Land Labour Capital Enter premiership	1hr		
Price theory	Understand relation between price, demand and	Demand and supply Price fixing Inflation	3hrs	5hrs	Practicals will be by use of secondary d explain situation of the market
	Understand relationship between trade and inflat	Types of trades Exchanges rates Inflation	2hrs		
	Assessment		2hr		

Department: Forest Business Management FBM 500

17.4.4 Module: FBM 504: Financial Management (18hrs)

Modules objectives: On completion of the module the student should be able to:

Predict success or failure of projects

Monitor and evaluate project profitability

Identify areas of cases

Develop strategies and make directed decisions

Topic	Learning objectives The student should be able to:	Sub-topic	Time		Remarks
			Theory	Practical	
Introduction	Understand terms and importance of financial management	Definition of terms Importance of financial management	1hr		Must be taught before Business management
Basic books of accounts and book-keeping	Know the different books of accounts and their uses	Ledgers Financial statements Journals Receipts	10hrs	4hrs	Be taught after financial management
Balance sheet	Prepare balance sheet	Liabilities and assets Preparation of balance sheet	10hrs		Explain market situation
Monitoring and evaluation	Forecast the success and failure of the projects	Areas of monitoring Indicators Strategies	1hr		Analysis result to select different options
Assessment			1hr		

17.5 Department: Forest Engineering FE 600

17.5.1 Module: FBM 601: Road Construction (19hrs)

Modules objectives: On completion of the module the student should be able to:

Construct forest roads

Trace roads, directions and lengths on maps and planes

Align roads in forests and nurseries

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Understand terms used in road construction	Definition and scope Importance of roads Types of roads	1hr		This module is related to logging, plantation establishment and natural high forest management must be taught before. Practical will be both classroom and field trips
Land surveying	Align roads not works	Measurement of length Chain survey Compass and chain survey Plane tabling Area determination	2hrs	4hrs	
Road tracing and contouring	Determine directions and length of roads on maps	Maps and Planes Coordinates Map reading and Interpretation Instruments and procedures Theory of rise and fall Preparation of roads section	2hrs	3hrs	

Topic	Learning objectives The student should be able to:	Sub-topics	Time		Remarks
Forest roads	Construct forest roads of the required standards	Road planning Road construction Road maintenance	2hrs	3hrs	Practicals will be field trips
Assessment			2hrs		Practicals

Department: Forest Engineering FE 600

17.5.2 Module: FBM 602: Ergonomic (48hrs)

Modules objectives: On completion of the module the student should be able to:

Apply principles of engineering

Reduce accidents in work environments

Ensure welfare of the workers

Ensure health of the workers

Topic	Learning objectives The student be able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Understand the meaning and need ergonomics	Definitions Importance and Applications of principles of ergonomics	2hrs		This has strong bearing to all the other modules, so must be taught before
Ergonomics	Manage Human work environment needs	Work and body Work environment Technology Planning Accidents and work organization Accident and their prevention Working condition Human resource Inventory	14hrs	29hrs	Practicals will be Field trips and class
Assessment			3hrs		

Department: Forest Engineering FE 600

17.5.3 Module: FBM 603: Logging (48hrs)

Modules objectives: On completion of the module the student should be able to:

Carryout logging operations effectively

Maintain logging tools and machines

Calculate log volumes and cost

Topic	Learning objectives The student able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Understand various terms in logging	Definition of logging and terminologies in logging Aspects and Principles of logging	1hr		This module must be taught before sawmills
Logging	Carryout various logging operations effectively	Logging site Log sizing Safety precaution and grading Planning crosscutting Felling and thinning Logging cost	6hrs	10hrs	Practicals will be field trips
Harvesting poles and firewood	Site, grade and stack poles and firewood	Felling and cross cutting Sizing and grading Handling and marketing Sacking	4hrs	9hrs	Practicals will be field trips

Topic	Learning objectives The student is able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Maintenance	Maintenance of tools and equipment effectively	Types of logging tools and equipment Maintenance of tools and equipments Precautions in use and maintenance of tools and equipment Uses of tools and equipments	5hrs	10hrs	Practicals will be in workshops/store
Assessment			3hrs		

Department: Forest Engineering FE 600

17.5.4 Module: FBM 604: Forest hand tools and equipments (33hrs)

Modules objectives: On completion of the module the student should be able to:

Identify forest tools and machines and their uses

Maintain forest tools and machines

Train other in the use of forest tools and machines

Take precaution in use of forest tools and machines

Topic	Learning objectives The student should able to:	Sub-topics	Time		Remarks
			Theory	Practical	
Introduction	Distinguish forest hand tools and machines from others	Definition Several aspects or principles of tools and machines			
Forest tools	Use and maintenance of tools	Safety precautions Types, description and use of various tools and machines Maintenance of the various tools and machines Transport and storage of the various tools and machines Training in tools and machine use and maintenance	1hr		This module must be taught after Ergonomics
Forest machines	Use and maintenance of the machines	Safety precautions Types, description and use of various tools and machines Maintenance of the various tools and machines Transport and storage of the various tools and machines Training in tools and machine use and maintenance	5hrs	10hrs	Practicals will be in the store and field
Assessment			2hrs	0	Practical will be in the workshop/saw mill and field trips