



### List of New Course (s) Introduced

**Department : Department of Forestry, Wildlife and Environmental Sciences**

**Program Name : B. Sc. (Forestry)**

**Academic Year : 2017-18**

#### **List of New Course(s) Introduced :**

The following new courses were introduced in the of B. Sc. (Forestry) Four year degree programme:

B. Sc. (Forestry)	Tree seed Technology&Plantation Forestry
B. Sc. (Forestry)	Carbon Forestry



## Minutes of Meetings (MoM) of Board of Studies (BoS)

**Academic Year : 2017-18**

**School : School of Natural Resources**

**Department : Department of Forestry, Wildlife and Environmental Sciences**

**Date and Time : June 18, 2015 - 11:00 AM**

**Venue : Departmental Meeting Hall**

The scheduled meeting of member of Board of Studies (BoS) of Department of Forestry, Wildlife and Environmental Sciences, School of Studies of Natural Resources, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the B. Sc. (Forestry) 4 Year Degree Program scheme and syllabi.

The following members were present in the meeting:

1. Prof. N. P. Todaria (External Expert Member BoS, Dept. of Forestry, H. N. B. Garhwal, Central University, UK)
2. Prof. S. S. Singh (Member BoS, Dept. of Forestry, Wildlife and Environmental Sciences)
3. Dr S. S. Dhuria (Member BoS, Associate Professor, Dept. of Forestry, Wildlife and Environmental Sciences)
4. Dr. Garima Tiwari (Member BoS, Assistant Professor, Dept. of Forestry, Wildlife and Environmental Sciences)

Following points were discussed during the meeting

- Prof. N.P. Todaria External Examinees sent revised syllabus as per guidelines of CBCS on 18/06/2015 as a expert
- B.Sc. Forestry 4 years 8 semester and M.Sc. Forestry and Environmental sciences 2 Years four semester syllabus has been discussed restructured and finalized as per the need of choice based credit system.
- The entire syllabus of both programmes were revised and made as per the choice based credit system.
- B.Sc. Forestry programme will have a total of 184 credit point and M.Sc. Forestry Programme will have 98 credit points in total.
- B.Sc. Forestry Syllabus will have 40 papers up to VII Semester and VIII Semester will have following training program :
  - Forest Institutes and Industrial Visits.
  - Forestry Operations (Working Experience)
  - Socio-Economic Survey - Village Attachment



- The students will prepare the report based on the above trainings and evaluation will be done by one external examiner and two internal examiners.
- There will be one student project in B.Sc. Forestry program which will be allotted in III Semester and will be evaluated by a panel of two teachers of the department at the end of IV Semester.
- M.Sc. Forestry and Environmental Sciences syllabus will have 18 papers up to III Semester and IV Semester have following:
  - Field Training (Attachment with State Forest Department)
  - Industrial Training
  - Computational Skills
  - Student Project
- The students will prepare the report based on the above trainings and evaluation will be done by one external examiner and two internal examiners.
- Student project will be evaluated by a panel of two teachers of the department.
- There will be two specializations i.e.,
  - Forest Genetic Resources (FGR)
  - Forest Management (FM)
- Above subjects will be offered to the student as per their choice in the III Semester of the M.Sc. program.
- Minimum passing marks for each theory papers, practical, student project and trainings will be 40%.
- Computation of SGPA and CGPA will be done as per the UGC guidelines.
- Credit details, marks distribution and course content have been mentioned in the syllabus of B.Sc. Forestry and M.Sc. Forestry and Environmental Sciences program.
- The study tour to forest operation sites, forest nursery, wildlife habitat and plantation sites will be conducted as per the requirement in each semester.



The following new courses were introduced in the of B. Sc. (Forestry) Four year degree programme:

B. Sc. (Forestry)	Tree seed Technology&Plantation Forestry
B. Sc. (Forestry)	Carbon Forestry

**विभागाध्यक्ष**  
**Head**

वानिकी, वन्यजीव एवं पर्यावरण विभाग  
Department of Forestry, Wildlife and Environmental Science  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

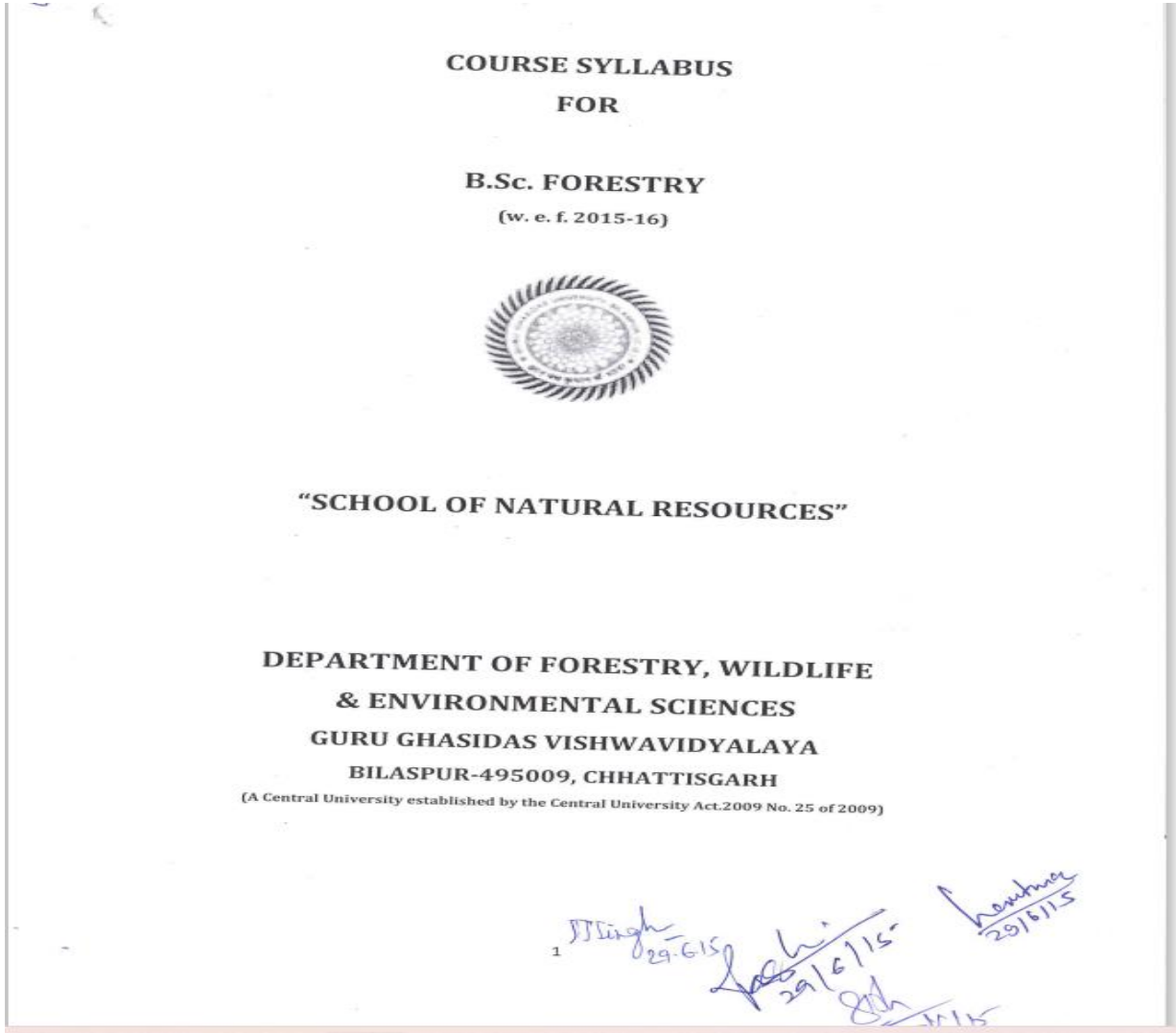
Signature & Seal of HoD

गुरु घासीदास विश्वविद्यालय  
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)  
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Guru Ghasidas Vishwavidyalaya  
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)  
Koni, Bilaspur - 495009 (C.G.)

## Scheme and Syllabus





B.Sc. IV <sup>th</sup> Semester					
S. No.	Title of Paper	Lecture	Tutorial	Practical	Credits
01.	Wood Technology & Nanoforestry	3	--	1	4
02.	Nursery Management and Commercial Forestry	3	--	1	4
03.	Rangeland Management	2	1	1	4
04.	Remote sensing and Its application in Forestry	3	--	1	4
05.	Forest Pathology	3	--	1	4
06.	Forest Policy and Legislation	2	1	1	4
07.	Student Project	--	--	1	1
<b>Total Credits</b>					<b>25</b>

B.Sc. V <sup>th</sup> Semester					
S. No.	Title of Paper	Lecture	Tutorial	Practical	Credits
01.	Utilization of Non-timber Forest Products	3	--	1	4
02.	Forest Tribology & Ethno-Forestry	3	--	1	4
03.	Fundamentals of Horticulture and Its Application	2	1	1	4
04.	Tree seed Technology & Plantation Forestry	3	--	1	4
05.	Fundamentals of Wildlife & Its Management	3	--	1	4
06.	Introductory Crop Production and Meteorology	3	--	1	4
<b>Total Credits</b>					<b>24</b>

B.Sc. VI <sup>th</sup> Semester					
S.No.	Title of Paper	Lecture	Tutorial	Practical	Credits
01.	Fundamentals of Extension Education	2	1	--	3
02.	Agro Forestry system and Management	3	--	1	4
03.	Carbon Forestry	3	--	1	4
04.	Forest Entomology	3	--	1	4
05.	Marketing and Trade of Forest Produce	2	1	1	4
06.	Principles of Plant Physiology	3	--	1	4
<b>Total Credits</b>					<b>23</b>

*Handwritten signatures and dates:*  
 Singh 29.6.15  
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 Singh 29/6/15



1. Jitendra Singh (2007) Basic Horticulture. Kalyani publishers.
2. J.S. Bal (2002) Fruit Growing in India. Kalyani publishers
3. Dr. K.L.Chadha, for ICAR, Govt. of India.(2015) Handbook of Horticulture. Jain book Agency.
4. George Acquaah (2002) Horticulture - Principles and Practices. Jain book Agency.

#### PAPER IV. TREE SEED TECHNOLOGY AND PLANTATION FORESTRY

Cr. 4(3+1)

Seed formation in trees. Classification of tree seed. Seed structure and chemical composition. Seed germination, seed viability and factors affecting seed viability. Seed Dormancy and pre-treatment of breakdown dormancy. Determining optimal harvest maturity indices. Seed collection methods - Equipments and planning. Seed Processing- seed extraction, drying, cleaning, grading, treating, bagging, labeling and storage. Storage of orthodox, recalcitrant seeds and fumigation and seed treatment. Seed Cryopreservation. Seed quality testing- purity, viability moisture, purity, vigor,

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J.S. Bal  
29.6.15

Prof. J.S. Bal  
29.6.15

germination, test of viability. Seed certification. Quality seed production technologies- Seed orchards, selection of seed trees, Plus tree & Elite tree.

Role of plantation forestry in meeting the wood demand- plantation forestry in India and abroad, planting programme, site preparation, choice of species, planting pattern, spacing, planting method. Nutritional dynamics and irrigation of plantation, protection and after care of plantation- weed control, climber cutting staking, pruning and thinning of plantation for quality production, failure of plantations. Biofuels - important biofuels and their silvicultural management. Identification of important fuel woods and petro-crops. Study of different biofuels used in India. Determination of calorific value, moisture and ash content and biomass.

#### PRACTICAL

Identification of seeds of tree species; Seed maturity tests; Determination of seed moisture; Seed germination test; Hydrogen peroxide test; Tetrazolium test for viability; Seed vigour and its measurements; Methods of breaking dormancy in tree seeds; Study of seed collection and equipments; Planning of seed collection; Seed collection; Seed extraction; Visit to seed production area and seed orchard; Visit to seed processing unit/testing laboratory; Study of seed sampling equipments. Planting geometry and calculation of planting stock. Study of different presowing treatments. Planting geometry and calculation of planting stock. Management of Eucalyptus, Casuarina, Teak, Sal, Poplar, Acacia and Bamboo plantations. Collection of data for survival and growth performance of different plantation. Use of fertilizers, weedicides for plantation management.

#### Suggested Readings:

1. Agrawal, P.K. and M. Dadlani (1987) Techniques in Seed Science and Technology, South Asian Publishers, Delhi.
2. Agrawal, R.L. (1996) Seed Technology. Oxford & IBH Publishing Co., New Delhi.
3. Anon. (1965) Field Inspection Manual and Minimum Seed Certification Standards, NSC Publication, New Delhi.
4. Faulkner, R. (1975) Seed orchard. Forestry Commission Bulletin No.54, 149 p.
5. Lars Schmidt (2000) Guide to Handling of tropical and sub-tropical forest seeds. Danida Forest Seed Centre, Denmark.
6. Nema, N.P. (1987) Principles of Seed Certification and Testing; Allied Publishers Pvt, Ltd, New Delhi.
7. Renugadevi, J and V Manonmani (2011) A handbook of seed testing. Agribios

#### PAPER V. FUNDAMENTALS OF WILDLIFE AND ITS MANAGEMENT

Cr. 4(3+1)

Introduction: Definition of wildlife, free living, captive, domesticated and feral animals. Distribution of



**Suggested Readings:**

1. Dwivedi, A.P. (1992) Agroforestry principles and practices. Oxford and IBH Publication Co., New Delhi.
2. Chundawat D S and Gautam S K (2010) Textbook of agroforestry. Oxford and IBH publishing co pvt. Ltd.
3. Nair, P.K.R. (1993) An introduction to agroforestry. Kluwer Academic Publishers. 499 p.
4. Huxley, P. (1999) Tropical agroforestry. Blackwell Science, Oxford. 371 p.
5. Khosla, P.K. and Khurana, D.K. (1987) Agroforestry for rural needs. Vol. I and II, ISTS, Solan, H.P.
6. Ong, C.K. and Huxley, P.K. (1996) Tree crop interactions - A physiological approach. ICRAF, Kenya. 386 p.
7. Ramakrishnan, P.S. (1992) Shifting agriculture and sustainable development. Man and biosphere series. The Parthenon Publishing Group. 424 p.
8. Sen Sarma, P.K. and Jha, L.K. (1993) Agroforestry. Indian Perspectives. Ashish Publishers, Delhi.

**PAPER III. CARBON FORESTRY**

**Cr. 4(3+1)**

Forests, Carbon and global climate. Forests and global carbon cycle. The key components of Forest Carbon: Carbon organic & inorganic, Carbon Source, Carbon Flow, Carbon Flux, Carbon Sink, Carbon Offset, Carbon Fertilization, Carbon footprint, Carbon Capture and Sequestration(CCS), Impacts of stand management on tree carbon stocks, Carbon in Woody debris and litter, BioSoil - a new forest soil survey. Trees and Forests as collectors of carbon. Forest operations effects on carbon flux.

The dynamics of carbon accumulation in tropical and temperate forests. Forest Soils as Carbon Reservoirs. Carbon Trade, Carbon Budget, Carbon Marketing, Carbon Dioxide Equivalent. The Potential Contribution of Indian Forests in carbon forestry. Carbon in Wood Products. Tree species wise Database for carbon stock. Carbon neutrality, carbon offset and carbon trading schemes. Forest Carbon management. Social Value Of forest Carbon. International Negotiations and the Political Context: Kyoto protocol.

**PRACTICAL**

Estimation of carbon content (organic/inorganic) in a wood, soil, litter and other forest based products, Sequestration of carbon in harvested wood products, Estimation of carbon flux, and CCS of forest trees/stands. Preparation of carbon inventories of different forest trees/stands. Establishment of forest carbon database, Survey to study the political/social context of carbon forestry.

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J.Singh  
29.6.15

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S.H.

**Suggested Readings:**

1. Ashton, M.S., Tyrrell, M.L., Spalding, D., Gentry, B. (Eds.) (2012) Managing Forest Carbon in a Changing Climate. Springer Dordrecht Heidelberg London New York
2. H S Gupta, M Yadav, M Verma, A David, U K Sharma and and C P Kal (2014) Science and Business of Carbon Forestry. TERI press, New Delhi.
3. Malti Goel, M Sudhakar, and R V Shahi (eds) (2006) Carbon Capture, Storage and Utilization: a possible climate change. UNFCCC report -2006.
4. Thompson, D. And Matthews, R.W. (1989). The storage of carbon in trees and timber. Research Information Note 160. Forestry Commission, Edinburgh.
5. Schlamadinger B. And Marland G. (2000). Land use and global climate change: Forests, Land Management, and the Kyoto Protocol. Pew Center on Global Climate Change (www.pewclimate.org/projects/land\_use.cfm).
6. Nabuurs, G.-J. (1996). Significance of wood products in forest sector carbon balances. In: Forest ecosystems, forest management and the global carbon cycle, eds M.J. Apps and D.T. Price. NATO ASI Series I, Springer-Verlag, Berlin.
7. Khosla, P.K. (1982). Improvement of forest biomass. Pragati Press, Delhi