



## Minutes of the Meeting of Board of studies held on 12-04-2016

A meeting of Board of studies (BOS) of the Department of Rural Technology and Social Development had been held on 12-04-2016 with following members to discuss, review and modify the syllabus for the degrees of B.Sc., M.Sc. and Ph.D. programs in Rural Technology.

1. Dr. R. Mehta (Chairman)
2. Prof. Karuna Verma (External Expert)
3. Dr. P. R. Singh (Member)
4. Dr. S. K. Nirala (Member)
5. Dr. D. K. Patel (Member)
6. Dr. Alka Mishra (Member)
7. Dr. Dilip Kumar (Member)

The Chairman of BOS welcomed the BOS members and following resolutions were passed:

1. After due discussion with all the members of the BOS, the syllabus had been modified and prepared to run the course under choice based credit system (CBCS) implemented from B.Sc.-1 Semester of session 2015-16 as per the instructions obtained from Guru Ghasidas Vishwavidyalaya and UGC.
2. The CBCS based syllabus for Integrated UG/PG B.Sc. III and IV Semester is approved by the BOS for session 2016-17 and onward.
3. Minor changes / improvements in spelling errors in few papers have been done without changing their main theme.
4. In M.Sc. IV Semester, course code 1002, title of the paper was changed as RS and GIS Applications in Natural Resource Management and Planning in place of "GIS Applications in Natural Resource Management and Planning"
5. In Pre PhD course, Title of RT 202 course title was corrected as Rural Technology-II in place of Rural Technology-III.
6. **Following new courses are introduced in the department from session 2017-18**

### List of New Course(s) Introduced

Sr. No.	Course Code	Name of the Course
<b>B.Sc. Rural Technology Courses</b>		
1.	FE-301	Environmental Studies-I
2.	RT-302	Poultry Production Techniques
3.	RT-303	Lac, Vermi and Apiculture Techniques
4.	RT-304	Laboratory Course (RT-302+303)
5.	RT-305	Mushroom Production Techniques
6.	RT-306	Sericulture
7.	RT-307	Laboratory Course (RT-305+306)
8.	RT-308	Morphology and Anatomy of Phanaerogames



9.	RT-309	Plant Physiology and Biochemistry
10.	RT-310	Laboratory Course (RT-308+309)
11.	RT-501	Introduction to Remote Sensing
12.	RT-502	Laboratory Course (Based on RT-501)
13.	RT-503	Introduction to Medicinal Plants
14.	RT-504	Laboratory Course (Based on RT-503)
15.	RT-505	Agricultural Equipments and Crop Production
16.	RT-506	Introduction to Horticulture
17.	RT-507	Laboratory Course (Based on RT-505 + 506)
18.	RT-E-508	Computer and its Application for Rural Development
19.	RT-E-509	Rural Energy Resources
20.	RT-E-510	Entrepreneurship and Small Business Management
21.	RT-601	Sensor and Digital image processing in Remote Sensing
22.	RT-602	Laboratory Course (Based on RT-601)
23.	RT-603	Ethnobotany and Indigenous Medicament
24.	RT-604	Laboratory Course (Based on RT-603)
25.	RT-605	Rural Infrastructure Engineering
26.	RT-606	Watershed Management
27.	RT-607	Laboratory Course (Based on RT-605+606)
28.	RT-E-608	Rural Health Care
29.	RT-E-609	Wooden Art
30.	RT-E-610	Dhokra Art
<b>M. Sc. Rural Technology</b>		
31.	RT-901	Extraction and Analysis of Medicinal Plants
32.	RT-902	Laboratory Course (Based on RT- 901)
33.	RT-903	Remote Sensing and GIS Application
34.	RT-904	Laboratory Course (Based on RT-903)
35.	RT-905	Soil and Water Conservation Engineering
36.	RT-E-906	Innovation in Indigenous Arts and Crafts
37.	RT-E-907	Laboratory Course (Based on RT-906)
38.	RT-E-908	Production Techniques of Natural Products
39.	RT-E-909	Laboratory Course (Based on RT-908)
40.	RT-1001	Drug Formulation and Evaluation
41.	RT-1002	RS and GIS Applications in Natural Resource Management and Planning
<b>Ph. D. Rural Technology</b>		
42.	RT- 2001	Rural Technology-I

**गुरु घासीदास विश्वविद्यालय**  
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)  
**कोनी, बिलासपुर - 495009 (छ.ग.)**



**Guru Ghasidas Vishwavidyalaya**  
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)  
**Koni, Bilaspur - 495009 (C.G.)**

43.	RT- 2002	Rural Technology-II
44.	RT- 2003	Research Methodology

  
**HEAD**  
Department of Rural Technology  
& Social Development  
Guru Ghasidas Vishwavidyalaya  
Bilaspur (C.G.) 495009

**B. Sc. III SEMESTER**

Subject Code	Course	Type of Course	Credit Distribution		Credits	Marks Distribution			Marks
			Lecture (L)	Practical (P)		Theory	Sessional	Practical	
Third Semester: 21 Credits (Core Lecture- 21 Credits)									
PL-301	Environmental Studies-I	CC	1	-	1	30	20	-	50
RT-302	Plastic Production Techniques	CC	2	-	2	30	20	-	50
RT-303	Lab. Work and Agriculture Techniques	CC	1	-	1	30	20	-	50
RT-304	Laboratory Course (RT-302+303)	CC	-	2	2	-	30	30	60
RT-305	Multicross Production Techniques	CC	2	-	2	30	20	-	50
RT-306	Sensitiser	CC	2	-	2	30	20	-	50
RT-307	Laboratory Course (RT-305+306)	CC	-	2	2	-	30	30	60
RT-308	Morphology and Anatomy of Phascomyces	CC	2	-	2	30	20	-	50
RT-309	Plant Physiology and Biochemistry	CC	2	-	2	30	20	-	50
RT-310	Laboratory Course (RT-308+309)	CC	-	2	2	-	30	30	60
	<b>Total</b>		13	06	19	315	200	90	605

CC- Core Course

**B. Sc. IV SEMESTER**

Subject Code	Course	Type of Course	Credit Distribution		Credits	Marks Distribution			Marks
			Lecture (L)	Practical (P)		Theory	Sessional	Practical	
Fourth Semester: 21 Credits (Core Course- 21 Credits)									
PE-401	Environmental Studies-II	CC	2	-	2	30	20	-	50
RT-402	Land Surveying, Levelling and Drawing Techniques	CC	2	-	2	30	20	-	50
RT-403	Building Construction Materials	CC	2	-	2	30	20	-	50
RT-404	Laboratory Course (RT-402+403)	CC	-	2	2	-	30	30	60
RT-405	Agricultural Microbiology	CC	2	-	2	30	20	-	50
RT-406	Apiculture	CC	2	-	2	30	20	-	50
RT-407	Laboratory Course (RT-405+406)	CC	-	2	2	-	30	30	60
RT-408	Economic Botany	CC	2	-	2	30	20	-	50
RT-409	Nursery Management Techniques	CC	2	-	2	30	20	-	50
RT-410	Laboratory Course (RT-408+409)	CC	-	2	2	-	30	30	60
	<b>Total</b>		13	04	21	315	200	90	605

CC- Core Course

*Shamshad Hossain*  
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**B. Sc. V SEMESTER**

Subject Code	Course	Type of Course	Credit Distribution		Credits	Marks Distribution			Marks
			Lecture (L)	Practical (P)		Theory	Sessional	Practical	
5th Semester: 14 Credits (Core Course- 14 Credits)									
RT-501	Introduction to Remote Sensing	CC	1	-	1	30	20	-	50
RT-502	Laboratory Course (Based on RT-501)	CC	-	1	1	-	30	30	60
RT-503	Introduction to Medicinal Plants	CC	2	-	2	30	20	-	50
RT-504	Laboratory Course (Based on RT-503)	CC	-	2	2	-	30	30	60
RT-505	Agricultural Equipments and Crop Production	CC	2	-	2	30	20	-	50
RT-506	Introduction to Horticulture	CC	2	-	2	30	20	-	50
RT-507	Laboratory Course (Based on RT-505 + 506)	CC	-	2	2	-	30	30	60
RT-508	Computer and its Application to Rural Development	CC	2	-	2	30	20	-	50
RT-509	Rural Energy Extension	CC	2	-	2	30	20	-	50
RT-510	Entrepreneurship and Rural Business Management	CC	2	-	2	30	20	-	50
	<b>Total</b>		14	00	14	420	280	100	800

CC- Core Course, EC- Elective Course. \*Out of three elective papers any two elective papers may be chosen.

**B. Sc. VI SEMESTER**

Subject Code	Course	Type of Course	Credit Distribution		Credits	Marks Distribution			Marks
			Lecture (L)	Practical (P)		Theory	Sessional	Practical	
6th Semester: 14 Credits (Core Course- 14 Credits)									
RT-601	Sensor and Digital Image Processing in Remote Sensing	CC	1	-	1	30	20	-	50
RT-602	Laboratory Course (Based on RT-601)	CC	-	1	1	-	30	30	60
RT-603	Ethnobotany and Indigenous Medication	CC	2	-	2	30	20	-	50
RT-604	Laboratory Course (Based on RT-603)	CC	-	2	2	-	30	30	60
RT-605	Rural Information Communication	CC	2	-	2	30	20	-	50
RT-606	Waterland Management	CC	2	-	2	30	20	-	50
RT-607	Laboratory Course (Based on RT-605 + 606)	CC	-	2	2	-	30	30	60
RT-608	Rural Health Care	CC	2	-	2	30	20	-	50
RT-609	Waste Air	CC	2	-	2	30	20	-	50
RT-610	Quality Air	CC	2	-	2	30	20	-	50
	<b>Total</b>		14	00	14	420	280	100	800

CC- Core Course, EC- Elective Course. \*Out of three elective papers any two elective papers may be chosen.

*Shamshad Hossain*  
12/11/16  
C.S.

*Ashish*  
12-01-16  
*RS*

Department of Rural Technology & Social Development  
Guru Ghosidas Vishwavidyalaya, Kauli-Bilaspur (CG)  
Semester-wise syllabus for UG-PG Integrated Course

Course Code: FE 301

B.Sc. III SEMESTER

Credit Credit:03

Marks: 50

Course Title: Environmental Studies-I

Multidisciplinary nature of environmental studies, Definition, scope and importance. Need for public awareness. Ecosystem: Concept of ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers.

Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem. Aquatic ecosystems (ponds, rivers, oceans).

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, forest and tribal people.

Water resources: Use and over-utilization of surface and ground water. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, and salinity.

Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Land resources: Land as a resource, land degradation, soil erosion and desertification. Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyles. Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

Reference Books:

Ecology and Environment: P.D. Sharma  
Biodiversity & Sustainable Conservation: Darshan Kumar  
Environmental Pollution and Management: P.C. Trivedi  
Ecology, Environment and Resource Conservation - J.S. Singh, S.P. Singh & S.R. Gupta

Course Code: RT- 302

B.Sc. III SEMESTER

Credit:02

Marks: 50

Course Title: Poultry Production Techniques

Breeds and Nutrition: Identification and characteristics of important Indian and Exotic poultry breeds, poultry nutrition- nutrients and their functions, energy sources, vegetable and animal protein sources.

Poultry farm Management: Farm system, provisions for good housing, chick and grower management, commercial layer and broiler management.

Breeding and production technology: Principles of breeding, breeding system, development of layer and broiler varieties, assessment of egg quality, nutritive value of eggs, grading of eggs, processing and preservation of poultry products- egg and meat.

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Department of Rural Technology  
Guru Ghasidas Vishwavidyalaya, Koni-Bilaspur (CG)  
Semester-wise syllabus for UG-PG Integrated Course

Srivastava: A textbook of applied entomology, vol I & vol II (1993, Kalyani publishers)  
The Insect. Ramesh Arora and G. S. Darsiwal  
The World of Honey Bee. A.S. Atwal  
Bee Keeping for pleasure and profit. Moh. Naim.  
Honeybee Disease and Management. D.P. Abrol.  
Perspective in Indian Apiculture. R.C. Mishra  
Atlas of Indian Lac. Ajit Prasad Jain.  
Lac cultivation in India. M.G. Kamath  
A handbook of shellac Analysis. G.N. Bhattacharya and P.K. Bose.  
Pnyogic kenclun Khad Sandarshika- D. Singh  
Earthworm-R.K. Bhatnager  
Vermicomposting for sustainable agriculture- R.K. Gupta  
Vermi resource technology- G. Tripathi  
Unified Zoology for Illyr- J.K. Awasthi (Shival Agrawal & Co., Indore)  
Vermi culture and organic farming- T.V. Sathie (Daya Pub.house).

Course Code: RT- 305                      B.Sc. III SEMESTER                      Marks: 50  
Credit: 02  
Course Title: Mushroom Production Techniques

Introduction- Distribution, History and scope of edible Mushrooms, Characteristic features of Basidiomycotina fungi.

Identification of commonly grown mushroom species in India, Edible mushroom and their characteristics, Nutritional value of Mushrooms, Features of poisonous mushrooms, Medicinal mushrooms and their properties.

Equipments used in spawn preparation and mushroom production, Culture preparation, spawn production technique and their management.

Production Techniques of Oyster Mushroom, Paddy Straw Mushroom, White Button Mushroom and White Milky Mushroom.

Post-harvest handling of mushrooms, Problems related to mushroom production. Management of pests and diseases.

Course Code: RT- 306                      B.Sc. III SEMESTER                      Marks: 50  
Credit: 02  
Course Title: Sericulture

Introduction to Sericulture: Definition, history and importance of sericulture, sericulture industry in India, prospects and problems.

Biology of silk moth: Study of mulberry and non-mulberry silk worms- Tasar, Eri and Munga including classification, geographical distribution, hosts plants and silk characteristics produced, anatomy of mulberry silk worm- Digestive system including mouth parts.

Reproductive system, life cycle including moulting and metamorphosis, silk glands, spinning of silk threads, factors influencing silk worm growth and silk production, diseases and pests of mulberry silk worm.

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Department of Rural Technology & Social Development  
Guru Ghansidas Vishwavidyalaya, Koni-Bilaspur (CG)  
Semester-wise syllabus for UG-PG Integrated Course

9. Morphological study of cultivable crustaceans and Pearl oysters.  
10. Studies of fishing gears.

**Reference Books:**

- Nigam: Biology of Non-choristates (1985, S. Chand)  
Jordan and Verma: Invertebrate Zoology (1995, S. Chand)  
Barrington: Invertebrate Structure and Function (1967, Nelson)  
Moore: An introduction to the Invertebrate (2001, Cambridge)  
Ekambaranath Ayar: A manual of Zoology, Part-I-Invertebrata, (1973, Vishwanathan)  
Kotpal, R. L.: Modern Textbook of Zoology: Invertebrates (1976, Rastogi)  
Marshall: Parker and Haswell Textbook of Zoology, Vol. I (7<sup>th</sup> ed. 1972, Macmillan)  
Pisciculture, Apiculture and Sericulture - S. Sachan  
A Text Book of Fish and Fisheries - G.S. Sandhu  
Machhali Palan - M.L. Arora  
Fresh water Fish Culture - V.R.P. Sinha & V. Ramchandran  
Text Book of Fish Processing and Technology - K. Gosakumar  
Pond and Fish Culture - C.B. Hall  
Toxicology- P.D. Sharma (Rastogi Pub.)  
Environmental Biology and Toxicology- P.D. Sharma (Rastogi Pub., Meerut).  
Fishes (An introduction to Ichthyology)- Moyle (PHI, Bhopal)  
Essentials of Ecology & Environ. Sc.- S.V.S. Rana (PHI, Bhopal)  
Animal Behaviour- Reena Mathur (Rastogi Pub., Meerut).  
A text book of fish biology and fisheries- Khanna and Singh (Narendra Pub. House, N.Delhi).

**B.Sc. IV SEMESTER**

Course Code: RT- 408

Credit:02

Marks: 50

Course Title: Economic Botany

Economic importance and uses of Cereals- Wheat, Rice, Maize, Jwar, Pulses-Soybean, Mustard, Gram, Pigeon Pea, Moong and Urd

Oil yielding plants: importance and uses of Coconut, Castor, Olive, Palm oil, Sunflower and Safflower.

Non-alcoholic Beverages- Tea, Coffee, Cocoa, Alcoholic beverages- Beer, Wine, Whisky, Vodka, Brandy.

Biofuels: First generation biofuels- bioalcohols; biodiesel, biogas, Second generation biofuel- Cellulosic ethanol, Algal fuel; Plants used as sustainable biofuel.

Importance and uses of fibre crops- Cotton, Flax and Jute; Wood- Teak, Sal and Sissoo, Rubber- *Hevea brasiliensis*, Fire wood, Bamboo

**B.Sc. IV SEMESTER**

Course Code: RT- 409

Credit:02

Marks: 50

Course Title: Nursery Management Techniques

Importance of Nursery, Types of nursery system, Physical and Financial resources for Nursery, Capital components of Nursery, Nursery Expenditure, Income and Profit analysis.

Plant propagation material, integrated nutrient management, irrigation system, Plant propagation

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Course Code: RT- 401

B.Sc. IV SEMESTER  
Credit:03

Marks: 50

**Course Title: Environmental Studies-II**

Biodiversity and its conservation: Introduction – Definition, genetic, species and ecosystem diversity, Biogeographical classification of India, Value of biodiversity, consumptive use, productive use, social, ethical, aesthetic values.

Biodiversity at global, National and local levels: India as a mega-diversity nation, Hot-spots of biodiversity, Threats to biodiversity, habitat loss. Endangered and endemic species of India, Conservation of biodiversity: *In-situ* and *Ex-situ* conservation of biodiversity.

Environmental Pollution: Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards, Solid waste Management, Causes, effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution, Disaster management : floods, earthquake and cyclone.

Social Issues and the Environmental Ethics: From Unsustainable to Sustainable development, urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns.

Wasteland reclamation, Consumerism and waste products, Environment Protection Act, Air Prevention and Control of Pollution Act, Water (Prevention and control of Pollution) Act Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness.

**Reference Books:**

1. Agrawal, K.C.2001 Environmental Biology Nidhi Publication Ltd
2. Miller T.G. Environmental Science, Wadsworth Publishing Co.(TB)
3. Sharma B.K. (2001) Environmental Chemistry, Goel Publication House, Meerut.
4. Environmental Biotechnology (Industrial Pollution Management) (2006) Himalaya Publishing House.
5. D. Sharma (2008) Environmental Biology, Rastogi publications

**B.Sc. IV SEMESTER**

Course Code: RT- 402

Credit:02

Marks: 50

**Course Title: Land Surveying, Leveling and Drawing Techniques**

Concept of surveying for rural development, objective, types, units of measurement, instruments used for surveying.

Chain surveying introduction, principle and purpose, accessories for chaining, methods, running survey lines, Types of ranging survey, Errors in chaining, Testing and adjustment of chain.

Plane table survey introduction, principle and purpose, various equipments used in plane table survey, Method of plane tabling, Errors in plane table survey and precautions to use.

Concept of contour, characteristics of contour; Methods of contouring, various contour map application. Concept of leveling, level surface, Differential Global Positioning System (DGPS) and

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7. Field visit to understand the different survey techniques.

Course Code: RT- 405

B.Sc. IV SEMESTER  
Credit:02

Course Title: Agricultural Microbiology

Marks: 50

Soil as a habitat for microorganisms. Soil microbes: algae, bacteria, actinomycetes, bacteriophages, protozoa, fungi and nematodes. Factors affecting soil microbial population.

Microbial balance, Rhizosphere and Rhizoplane microorganisms. Reasons for increased microbial activity in rhizosphere. Organic matter decomposition. Nutrient cycles.

Biofertilizers: Importance and its Classification of biofertilizers. Symbiotic and non-symbiotic nitrogen fixers.

Production of bacterial bio fertilizers. Green manuring, Mass cultivation of cyanobacteria, Mass cultivation of *Azolla*. Biodegradation of pesticides. Use of microorganisms in pest control.

Early concepts of air, Vedic technology for air purification, aero microbiology in India. Phylloplane microflora, phylloplane pathogens and microflora of floral parts.

Course Code: RT- 406

B.Sc. IV SEMESTER  
Credit:02

Course Title: Aquaculture

Marks: 50

Ichthyology and its scope, types of carp fishes and their characteristic features, common major and minor carps found in Chhattisgarh, larvivorous fishes, ornamental fishes.

Types of fins and scales, colouration, digestive system and feeding behavior, respiratory organs, aquatic and air breathing, swim bladder, excretion and osmoregulation, endocrine glands, reproductive system and development, breeding of fish, fish seeds.

Chemical composition of fish, preparation and maintenance of aquarium, plankton and their importance, economic value of fish, common disease of fish and their cure.

Definition and classification of fisheries, fish culture in ponds, composite fish farming and air breathing fish culture, fishing crafts and gears, fish preservation and processing, government schemes related to fish culture.

Prawn culture and its economic importance, pearl culture and its economic importance.

B.Sc. IV SEMESTER

Course Code: RT- 407

Credit:02

Marks: 50

Course Title: Laboratory Course (Based on RT- 405 + 406)

1. Gram staining of bacteria.
2. Culture preparation of bacterial biofertilizers.
3. Mass cultivation of Cyanobacteria.
4. Mass cultivation of *Azolla*.
5. Morphological studies of different fish types.
6. Study and mounting of fish scales and fins.
7. Identification of fish by fin formula.

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Course Code: RT-601

B.Sc. VI SEMESTER

Credit:03

Marks: 50

Course Title: Sensor and Digital image processing in Remote Sensing

Sensor – Active and passive sensor, imaging and non –imaging sensor. Sensors used in satellites. Image resolution and its type.

Specific features of Indian remote sensing satellites series, some other countries satellite.

Microwave remote sensing: Radar principle, SLAR, SAR. Geometrical characterization. Slope foreshortening, Layover, Aspects, Radar shadow.

Introduction to Digital Image Processing(DIP),Image Structure, Preprocessing of image, Image Enhancement, Vegetative index, Supervised & Unsupervised Classification.

Introduction to GIS, Components of GIS, Data Structure- Raster & Vector formats. Data Encoding & Storage, Data Manipulation & Data Output, Introduction to Data Base management.

Reference Books:

- Remote Sensing – Principles & interpretation: F.F. Sabins  
Digital Remote Sensing, Concept Publishing company: Dr. P.Nag, Dr. M. Kodrat  
Principles of Remote Sensing, Longman: P. J. Curran  
Digital Image Processing in Remote Sensing: J. A. Richards Springer  
Remote Sensing – Principles & interpretation: F. F. Sabins  
Remote Sensing & Image interpretation: J.illesand & Keifer  
Remote Sensing – Principles & interpretation: P.F. Sabins

B.Sc. VI SEMESTER

Course Code: RT-602

Credit:01

Marks: 50

Course Title: Laboratory Course (Based on RT-601)

1. Creating different features like polygon, Line, tic (point), Polyline, Creation of personal geo database,
2. Digital Image Processing (DIP)
3. Techniques such as PCA, HIS.

B.Sc. VI SEMESTER

Course Code: RT-603

Credit:03

Marks: 50

Course Title: Ethnobotany and Indigenous Medicament

Ethnobotany- Definition and scope, Traditional and alternative systems of medicines- Ayurveda, Unani, Homeopathy, Sidha & Aromatherapy, Classification of crude drugs- Alphabetical, Taxonomical, morphological, chemical and Pharmacological.

Ethnomedicinal plant- *Allium sativum*, *Aloe vera*, *Azadiracta indica*, *Ricinus communis*, *Terminalia arjuna*, *T. bellarica*, *T. chebula*, *Oscimunt sanctum*, *Withania somnifera*, *Commiphora wightii* (Googul).

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12-04-16

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Department of Rural Technology & Social Development  
Guru Ghasidas Vishwavidyalaya, Koni-Bilaspur (CG)  
Semester-wise syllabus for UG-PG Integrated Course

Mittal D.C., Engineering Materials  
S. Kulkarni G.J., Engineering Materials  
Rangwala S.C., Water Supply & Sanitary Engineering, Charotar Publishing House (P)  
Lid., Anand.  
Gurcharan Singh, Water Supply & Sanitary Engineering, Standard Publishers Distributors, Delhi  
Garg S.K., Water Supply Engineering, Khanna Publishers, Delhi.  
Gupta D.V., Water Supply & Sanitary Engineering, Asian Publishers, Muzaffarnagar  
Modi P.N., Water Supply Engineering, Standard Book House, Delhi

Course Code: RT-606      B.Sc. VI SEMESTER      Marks: 50  
Credit:03  
Course Title: Watershed Management

Concept of land and water management, LULU pattern, Soil erosion, Water erosion, runoff erosivity factor.  
Hydrological cycle, rainfall and its measurement, Meteorological data analysis, ground and surface recharge, water conservation and recycling.  
Watershed management concept- objectives, types, characterization, planning and execution, suitable plants and crops for watershed area  
Introduction to integrated watershed management programme and their impact, Application of Remote Sensing & GIS in watershed management for Natural Resource Management.

Reference Books:  
Integrated watershed management: Rajesh Rajora  
Watershed management: E.M. Tidena  
Soil erosion and conservation: R.P. Tripathi and S.P. Singh  
Land and Water Management: V.V.N. Murti

Course Code: RT-607      B.Sc. VI SEMESTER      Marks: 50  
Credit:02  
Course Title: Laboratory Course (Based on RT-605+606)

1. Visit of bridges.
2. To study about cross section of the road.
3. Visit to watershed area and identification of problems.
4. Preparation of various models for watershed management.
5. Watershed Map preparation through remote sensing.

Course Code: RT-E-608      B.Sc. VI SEMESTER      Marks: 50  
Credit:02  
Course Title: Rural Health Care

Rural Health: Understanding of health, epidemiology, natural history of diseases, determinants of health, indicators of health.  
Rural Health and Nutrition Status: Health and nutrition linkages and status, dietary intake, trends in health and nutrition, factors influencing health and nutrition status.

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12-04-16

Department of Rural Technology & Social Development  
Guru Ghasidas Vishwavidyalaya, Kori-Bilaspur (CG)  
Semester-wise syllabus for UG-PG Integrated Course

Types of raw material used, raw material availability, tools used, traditional and modern design technique used in Dhokra art, methodology used for preparation of Dhokra art

Marketing of Dhokra art at local, national and international level, status of Dhokra artesian in India and Chhattisgarh.

Socio-economic status of Dhokra artesian. Entrepreneurship and sustainable development of Dhokra artesian.

Contribution of Government and Non-government organizations for development and publicity of Dhokra art.

**Reference Books:**

Metal Craftmen in India, Meera Mukherjee  
Tribal Heritage of Madhya Pradesh, H.L. Shukla  
Baster Bhusan, K.N.Thakur

Handwritten notes and signatures:  
A circled 'RG' with an arrow pointing to the right.  
A signature 'Sukanta' with the date '12-04-16' below it.  
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Department of Rural Technology & Social Development  
Guru Ghansidas Vishwavidyalaya, Koni-Bilaspur (CG)  
Semester-wise syllabus for UG-PG Integrated Course

Data Models- classic data models, Hierarchical data models, network and relational data models,  
Maps and GIS: Introduction, Cartographic data, Map scale, Classes of maps, Map Projection.

Data Input: digitization & Scanning methods, Data storage, Data output, Hard copy and soft copy devices.

Role of GIS in resource management and other interdisciplinary applications.

**Reference Books**

Digital Image Processing in Remote Sensing  
Remote Sensing - Principles & interpretation.  
Remote Sensing & Image interpretation.

**M.Sc. III SEMESTER**

Course Code: RT-904

Marks: 100

Course Title: Laboratory Course (Based on RT-903)

1. Familiarization with GPS.
2. Visual interpretation of satellite data and identification of broad land use categories.
3. Geometric correction and radiometric correction.
4. Mosaicing and Sub setting.
5. Stacking of Image.
6. Image classification : Supervised and Unsupervised.
7. Feature digitization from Toposheet.
8. Creation of Slope, aspect and digital elevation model.

**M.Sc. III SEMESTER**

Course Code: RT-905

Marks: 100

Course Title: Soil and Water Conservation Engineering

Definition of soil and soil engineering. Soil as a three phase system, Soil-Plant-Water relationship, Water content, density, void ratio, porosity and degree of saturation.

Water resources of India and their utilisation, Water cycle, Water law, basic concept of water quality assessment.

Concept of Irrigation, Types of irrigation, Source of irrigation water. Water lifting devices, Irrigation methods and efficiencies, water measuring devices and Conveyance systems.

Design of irrigation canals, Various types of canal lining - Advantages & Disadvantages, Canal Head Works- Definition, object, general layout, functions of different parts.

Surface drainage of agriculture land, sub surface drainage, basic concept of Aqueduct, Siphon, Super passage, Level crossing, inlet and outlet. Principles of water erosion control of water erosion.

**Reference Books**

Introduction to soil and water conservation engineering, Mal, B C, Kalyani publishers  
Irrigation Engineering- Agarwal G.D., B. Bharti Prakashan, Meerut.  
Irrigation Engineering- Modi P.N., Standard Book House, Delhi.  
Irrigation Engineering- Dr. Bharat Singh, Nem Chand & Bros., Roorkee  
Introductory Soil Science, Dilip Kumar Das, Kalyani Publishers.

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Department of Rural Technology & Social Development  
Guru Ghasidas Vishwavidyalaya, Kani-Bilaspur (CG)  
Semester-wise syllabus for UG-PG Integrated Course

Mulberry and non-mulberry sericulture- Species of silk worms, Production of mulberry and non-mulberry silk in India, Rearing of tasar and mulberry silk worm, pest predators of tasar and mulberry silk worm, tasar and mulberry industries in Chhattisgarh, problem of tasar and mulberry culture.

Vermiculture- Species, morphology of verms, growth feature of verms and climatic effect and production of vermi-compost. Bio-gas generation and management.

**Reference Books**

Mori-culture, instructional cum practical Manual, Vol - I, Dr. A.K. Dhote.

Development of Sericulture: M. Laxmi Narasiah

An introduction of Sericulture, G & J Sulochana

Tropical Tasar culture: P. Mohanty

Mushroom Culture in India - Neeta Bhal

Lac cultivation - C.R. Negi

Lac production technique - ILRI Publication Ranchi

A Monograph on Lac - Roonwal M.L.

M.Sc. III SEMESTER

Marks: 50

Course Code: RT-E-909

Course Title: Laboratory Course (Based on RT-E-908)

1. Study of equipments used in spawn preparation and mushroom production.
2. Study of equipments used in apiculture and sericulture

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Department of Rural Technology & Social Development  
Guru Ghasidas Vishwavidyalaya, Koni-Bilaspur (CG)  
Semester-wise syllabus for UG-PG Integrated Course

Course Code: RT-1002

M.Sc. IV SEMESTER

Marks: 100

Course Title: RS and GIS Application in Natural Resource Management and Planning

Remote sensing in agriculture- Introduction, conventional survey, vegetation types, spectral properties of vegetation, crop identification, crop yield, acreage estimation.

Land use/ land-cover: Basic concept & criteria of land-use classification, methodology, classification system, level of classification. Land use and land cover mapping.

Remote sensing in forestry: Introduction, conventional classification, forest cover mapping, forest fire mapping, forest density determination. Vegetation indices.

Remote sensing in urban planning - Population estimates, growth perception, suitability analysis for public places, identification of suitable site for recreation, transportation and other facilities. Change detection analysis through time series data.

Remote sensing in rural planning - rural population distribution, growth perception, identification of suitable site for settlement, transportation, storage, irrigation systems and other facilities. Change detection analysis through time series data.

**Reference Books**

Digital Image Processing in Remote Sensing - J.A. Richards.

Remote Sensing - Principles & interpretation - F.F. Sabins.

Remote Sensing & Image interpretation - Lillesand & Keifer.

Remote Sensing of Natural Resources - Guang xing wang, Quihao wang

NRSC book on Remote Sensing Applications.

Digital Image Processing in Remote Sensing - J.A. Richards.

Remote sensing for Natural Resource Management and Environmental Monitoring: Susan Ustin

Course Code: RT-1003

M.Sc. IV SEMESTER

Marks: 300

Course Title: Dissertation

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