List of Courses which focuses on Professional Ethics, Gender, Human Values, Environment & Sustainability and other value framework

Department : *Rural Technology and Social Development*

Programme Name : *B.Sc. and M.Sc.*

Academic Year : 2019-20

Courses which focuses on Professional Ethics, Gender, Human Values, Environment & Sustainability and other value framework:

Sr. No.	Course Code	Name of the Course
01.	RTUATC1	Organic Manure Production Techniques
02.	RTUATG1	Plant Propagation and Nursery Management
03.	RTUBTG1	Horticulture and Landscaping
04.	RTUCTA1	Integrated Pest Management
05.	RTUCTG1	Basics of Mushroom Production
06.	RTUCTC2	Herbal Production Techniques
07.	RTUDTA1	Plant Morphology and Reproduction
08.	RTUDTC3	Natural Product Management
09.	RTUETD3	Agricultural Equipments and Crop Production
10.	RTUETD4	Watershed Management
11	RTUFTD2	Organic Farming
12	RTUATG1	Soil and Fertilizers
13.	RTPBTA1	Research Methodology and Ethics
14.	RTPATC1	Concepts of Statistical Analysis

Scheme and Syllabus

Department of Rural Technology and Social Development
School of Studies in Interdisciplinary Education and Research,
B.Sc. Hon's (Syllabus Scheme as par LOCF) 2021-22

Semester	Course Opted	Course Code	Name of the course	Credit	Hour / week
I	Core-1	RTUATC1	Organic Manure Production Techniques	4	4
	Core -1 Practical	RTUALC1	Laboratory Course based on theory	1	2
	Core -2	RTUATC2	Elementary Biology	4	4
	Core -2 Practical	RTUALC2	Laboratory Course based on theory	1	2
	Generic Elective -1	RTUATG1	Soil and Fertilizers	4	4
	Generic Elective - Practical	RTUALG1	Laboratory Course based on theory	1	2
	Ability Enhancement Compulsory Course		English Communication / MIL (Hindi Communication)	2*	3
	ECA	RTUAPS1	ECA-Extra-curricular activity/ Tour, Field visit/ Industrial training/ NSS/ Swachchhta/ Vocational Training/ Sports/ others	2	2
			TOTAL	19	23

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Guru Ghasidas Vishwavidyalaya, Koni-Bilaspur (CG)
Semester-wise syllabus for UG Course 2021-2022

SYLLABUS as per LOCF B.Sc. I SEMESTER		
Course Title: ORGANIC MANURE PRODUCTION TECHNIQUES		
Course Code: RTUATC1	**Credit: 04**	**Marks:100**

Learning outcomes
On completion of the course, the students will be able to:

- Provide Knowledge about organic manures, their types and production process.
- Develop awareness regarding the harmful effect of chemical fertilizers and learned the production methods of organic manures.
- Understand the development of skill related to production and marketing.

Organic manure- concepts, meaning, definition and importance of organic manure, types of manures, components of organic manure, preparation method of manures, farm yard manure, vermicompost, chemical composition of manures, precaution needed for compost preparation.

Composting Methods- Indore method, trench method, heap method, strip method, vegetable wood box method, analysis of quality of compost and its chemical composition.

Nadep compost- Preparation of Nadep compost, construction and design of nadep compost tank, traditional design and low cost compost pit, chemical composition of nadep compost.

Organic Farming-Introduction, concept, principle and importance of organic farming, green manure, BGA, azolla, recycling of organic residues, application of manures, regulations and policy related to organic manure production.

Suggested Readings:

Dr. N. L. Sharma & Dr. T. B. Singh- Mrida Vigyan Ayum Khad Urvark-
S.S. Reddy- Principles of Agronomy
Joseph C. Gilman- A manual of soil fungi-
Dilip Kumar Das- Introductory Soil Science-
Dr. N. L. Sharma & Dr. T. B. Singh- Mrida Vigyan Ayum Khad Urvark-
S.S. Reddy- Principles of Agronomy
A manual of soil fungi- Joseph C. Gilman
Dushyant Malhotra- Jav Urvarak
Arun K. Sharma- Jaivik Kheti
Das- Manures and fertilizers
Basak- Fertilizers A Text Book
Gustafson- Handbook of fertilizers

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUALC1	**Credit: 01**	**Marks:100**

1. Identification of various organic manures.
2. Preparation of nadep-compost
3. Preparation of FYM.
4. Preparation of vermicompost.
5. Demonstration of various types composting models.

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Semester	Course Opted	Course Code	Name of the course	Credit	Hour / week
I	Core-1	RTUATC1	Organic Manure Production Techniques	4	4
	Core -1 Practical	RTUALC1	Laboratory Course based on theory	1	2
	Core -2	RTUATC2	Elementary Biology	4	4
	Core -2 Practical	RTUALC2	Laboratory Course based on theory	1	2
	Generic Elective -1	RTUATG1	Soil and Fertilizers	4	4
	Generic Elective - Practical	RTUALG1	Laboratory Course based on theory	1	2
	Ability Enhancement Compulsory Course		English Communication / MIL (Hindi Communication)	2*	3
	ECA	RTUAPS1	ECA-Extra-curricular activity/ Tour, Field visit/ Industrial training/ NSS/ Swachchhta/ Vocational Training/ Sports/ others	2	2
			TOTAL	19	23

SYLLABUS as per LOCF B.Sc. I SEMESTER		
Course Title: SOIL AND FERTILIZERS		
Course Code: RTUATG1	**Credit: 04**	**Marks:100**

Learning outcomes
On completion of the this course, the students would be able to

- Understand types of rocks and mineral
- Understand about types of soil and soil profile.
- Learn nutrient management in plants and application of bio fertilizers.

Rocks and Minerals: Rocks and its classification, weathering of rocks, soil formation-physical, chemical and biological soil forming process.

Soil: Introduction, definition, components of soil, soil profile, types of soil, physical properties of soil- soil color, soil separates, soil structure, soil texture, bulk density, particle density and porosity of soil.

Soil Air: soil aeration, factor affecting soil aeration, soil water and soil water movement, soil moisture measurement, availability of soil water,

Fertilizers: Macro elements and Micro elements, classification of fertilizers, deficiency symptoms in plants, Integrated Nutrient Management (INM), application methods of fertilizers,

Bio Fertilizers: Intoduction, Concept, Types of Biofertilizers, Nitrogenfixing biofertilizers, Phosphate-solubilizing biofertilizers, Preparation of a biofertilizers-*Azolla*, Blue Green Algae (BGA).

Suggested Readings:

Dilip Kumar Das- Introductory Soil Science
Dr. N. L. Sharma & Dr. T. B. Singh- Mrida Vigyan Ayum Khad Urvark
S.S. Reddy-Principles of Agronomy-
Das- Manures and fertilizers
Basak- Fertilizers A Text Book-
Gustafson- Handbook of fertilizers
Hand book of Fertilizer Association of India, New Delhi, 1998.
Slack A.V- Chemistry & Technology of Fertilizers, Interscience, New York, 1967.
N S Subba Rao-Bio fertilizers in Agriculture,Oxford & IBH Publishing Company

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUALG1	**Credit:01**	**Marks:100**

1. Study of different types of rocks.
2. Study of different types of soil.
3. Measurement of soil moisture, pH, bulk and particle density.
4. Identification of various fertilizers.
5. Calculation of fertilizers doses for crops.
6. To study about green manuring.

II	Core-3	RTUBTC1	Microbial Technology	4	4
	Core -3 Practical	RTUBLC1	Laboratory Course based on theory	1	2
	Core -4	RTUBTC2	Dairy Management and Products	4	4
	Core -4 Practical	RTUBLC2	Laboratory Course based on theory	1	2
	Generic Elective -2 (GE-IB)	RTUBTG1	Plant Propagation and Nursery Management	4	4
	Generic Elective - Practical	RTUBLG1	Laboratory Course based on theory	1	2
	Ability Enhancement Compulsory Course (AECC)		Environmental Science	2*	3
	ECA	RTUBPS1	ECA-Extracurricular activity/ Tour, Field visit/ Industrial training/ NSS/ Swachchhta / vocational Training/ Sports/ others	2**	2**
			TOTAL	17+2**	21+2**
SUMMER Internship: 15 days			**Swayam Swachchhta / NSS / Industrial/ others**	**2**	**100**

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Semester-wise syllabus for UG Course 2021-2022

SYLLABUS as per LOCF B.Sc. II SEMESTER		
Course Title: PLANT PROPAGATION AND NURSERY MANAGEMENT		
Course Code: RTUBTG1	**Credit: 04**	**Marks:100**

Learning outcomes
On completion of this course, the students will be able to:

- Understand various plant nursery and its special functions.
- Acquired skills about propagation of nursery plants and their handling
- Calculate the recommended dose of pesticide and fertilizers in orchard.
- Gain technical confidence and skills for establishment of plant nursery.

Concept, meaning, definitions and Importance of plant nursery, Types and functions of plant nursery, site selection for nursery, physical and financial resources for nursery, nursery expenditure, Cost and profit analysis.

Plantation techniques: soil analysis, land preparation, pit formation, species selection, planting system, pit filling, preparation of nursery beds and management of mother plants.

Plant propagation, method- Sexual and Asexual propagation, Vegetative propagation-division, cutting, layering, budding and grafting. Micro-propagation and hardening, plant propagation material, integrated nutrient management, irrigation system, packing and transport of nursery plants.

Planting time and planting method- entire plant planting and stump planting, clonal plantation, pre and post activity in plantation, water, nutrients, weeds, disease and pest management of planted plant, Training and pruning practices.

Protected propagation structures-Quonset, Gutter connected, Glass House, plastic film Green House, Rigid Panel Greenhouses and Greenhouse with Double-Layer Covering.

Suggested Readings:
Plantation Forestry : R.K. Luna
Nursery Technology: S.S. Negi
Plant Propagation and Nursery Husbandry: J.S. Yadav
Introductory Horticulture: E.P. Christopher

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUBLG1	**Credit:01**	**Marks:100**

1. Layout preparation for plant nursery.
2. Sexual and asexual methods of plant propagations; Seed, division, cutting, layering, budding and grafting.
3. Preparation of nursery beds
4. Preparation of planting media.
5. Training and pruning practices in nursery plants.
6. Potting and repotting of nursery plants.
7. Nursery plant management.

Semester	Course Opted	Course Code	Name of the course	Credit	Hour / week
III	Core-5	RTUCTC1	Sericulture	4	4
	Core -5 Practical	RTUCLC1	Laboratory Course based on theory	1	2
	Core -6	RTUCTC2	Basics of Mushroom Production	4	4
	Core -6 Practical	RTUCLC2	Laboratory Course based on theory	1	2
	Core - 7	RTUCTC3	Aquaculture	4	4
	Core – 7 Practical	RTUCLC3	Laboratory Course based on theory	1	2
	Generic Elective -3 (GEII-A)	RTUCTG1	Integrated Pest Management	4	4
	Generic Elective - Practical	RTUCLG1	Laboratory Course based on theory	1	2
	Skill Enhancement Course (SEC - 1)	RTUCTA1	Horticulture and Landscaping	2	2
	Skill Enhancement Course (SEC - 1)	RTUCLA1	Laboratory Course based on theory	2	4
			TOTAL	24	30

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Semester-wise syllabus for UG Course 2021-2022

SYLLABUS as per LOCF B.Sc. III SEMESTER		
Course Title: HORTICULTURE AND LANDSCAPING		
Course Code: RTUCTA1	**Credit: 02**	**Marks:100**

Learning outcomes

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

- Understand the knowledge about horticulture practices and its importance.
- Learn detail information of orchard establishment and management will able to disseminate this knowledge to the farmers.
- Adopt horticulture as entrepreneurship.

Horticulture: Concept, scope, definition, economic importance and classification of horticultural crops, fruit and vegetable zones of India, exports and imports opportunities , Government schemes / programs related to horticulture and landscaping.

Establishment of orchard: site selection, principles, planning and layout of orchard, tools and implements. Management of orchard-Planting systems, training and pruning, nutrient, water, weeds, and pests management in orchard trees. Cultivation practices of major fruit crops-Citrus fruits, papaya, banana, ber, Guava and Mango.

Fundamental of Floriculture, Scope and importance of floriculture in India, Importance and production technology of cut flowers and loose flowers. Production techniques of ornamental plants like rose, marigold, chrysanthemum, gladiolus, jasmine, dahlia, tuberose and gerbera.

Landscaping: Principles and components, landscape designs, Styles of garden: formal, informal and free style gardens; types of landscape: Urban landscaping, bio-aesthetic planning, eco- tourism, theme parks, indoor gardening.

Plant components for landscaping: Lawns-Establishment and maintenance, Plants-herbs, annuals, hedges, climbers and creepers, cacti and succulents, flower borders and beds, ground covers, carpet beds, bamboo groves.

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUCLA1	**Credit:02**	**Marks:100**

1. Identification of garden equipments required for gardening and landscaping.
2. Preparation and maintenance of garden
3. Propagation and maintenance of annuals and perennials.
4. Training and Pruning of plants
5. Cutting, budding and grafting practices.
6. Identification of common garden weeds.
7. Making of Bonsai, Terrarium culture.

Semester	Course Opted	Course Code	Name of the course	Credit	Hour / week
III	Core-5	RTUCTC1	Sericulture	4	4
	Core -5 Practical	RTUCLC1	Laboratory Course based on theory	1	2
	Core -6	RTUCTC2	Basics of Mushroom Production	4	4
	Core -6 Practical	RTUCLC2	Laboratory Course based on theory	1	2
	Core - 7	RTUCTC3	Aquaculture	4	4
	Core – 7 Practical	RTUCLC3	Laboratory Course based on theory	1	2
	Generic Elective -3 (GEII-A)	RTUCTG1	Integrated Pest Management	4	4
	Generic Elective - Practical	RTUCLG1	Laboratory Course based on theory	1	2
	Skill Enhancement Course (SEC - 1)	RTUCTA1	Horticulture and Landscaping	2	2
	Skill Enhancement Course (SEC - 1)	RTUCLA1	Laboratory Course based on theory	2	4
			TOTAL	24	30

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SYLLABUS as per LOCF B.Sc. III SEMESTER		
Course Title: INTEGRATED PEST MANAGEMENT		
Course Code: RTUCTG1	**Credit: 04**	**Marks:100**

Learning outcomes
On completion of this course, the students will be able to:

- Understand the objective of IPM and aware of harmful insect and pest.
- Learn pest monitoring, measurement of pest population and its effects in cropping fields.
- Understand the sustainable approaches for pest control and harmful effect of pesticides in environment public health.

Integrated Pest Management- Concept, meaning, importance and history of IPM. Relation of pests with plants, ranking of pests.

Concept, characteristic and types of insect and pests, Decision making in Integrated Pest Management, Types of Pesticides, host plant interaction with insects and pests, Host plant resistance capacity.

Effect of pests on cropping fields, measuring pest population and Estimation of crop loss.

Sustainable approach towards Integrated Pest Management, Monitoring of Pest in Crops.

Control of crops against adverse effect of pests, application of Cultural, Mechanical, Biological and Chemical methods in cropping fields, Advantage, limitations and application of IPM in different crops.

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUCLG1	**Credit:01**	**Marks:100**

1. Study the monitoring, surveillance and forecasting.
2. Assessment of pest population and damages at different growth stage of crops.
3. Preparation of low cost bio-pesticides.
4. Identification of different disease and pests.
5. Preparation of sticky and light trap to control of pest.

Semester	Course Opted	Course Code	Name of the course	Credit	Hour / week
III	Core-5	RTUCTC1	Sericulture	4	4
	Core -5 Practical	RTUCLC1	Laboratory Course based on theory	1	2
	Core -6	RTUCTC2	Basics of Mushroom Production	4	4
	Core -6 Practical	RTUCLC2	Laboratory Course based on theory	1	2
	Core - 7	RTUCTC3	Aquaculture	4	4
	Core – 7 Practical	RTUCLC3	Laboratory Course based on theory	1	2
	Generic Elective -3 (GEII-A)	RTUCTG1	Integrated Pest Management	4	4
	Generic Elective - Practical	RTUCLG1	Laboratory Course based on theory	1	2
	Skill Enhancement Course (SEC - 1)	RTUCTA1	Horticulture and Landscaping	2	2
	Skill Enhancement Course (SEC - 1)	RTUCLA1	Laboratory Course based on theory	2	4
			TOTAL	24	30

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SYLLABUS as per LOCF B.Sc. III SEMESTER		
Course Title: BASICS OF MUSHROOM PRODUCTION		
Course Code: RTUCTC2	**Credit: 04**	**Marks:100**

Learning outcomes

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

- Identify edible and non-edible mushrooms.
- Learn mushroom production techniques and their management.
- Build up the efficiency of mushroom production, management and marketing.

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

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

Spawn production technique- Equipments, mother culture preparation technique and their management.

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

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

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUCLC2	**Credit:01**	**Marks:100**

1. Identification of different mushroom species.
2. Equipment's used in mushroom production.
3. Culture preparation and Spawn preparation.
4. Different types of mushroom production.
5. Different types of Mushroom bed preparation.
6. Mushroom hut management.
7. Study of different types of pests and diseases of mushroom.

IV	Core-8	RTUDTC1	Rural Social Structure and Planning	4	4
	Core -8 Practical	RTUDLC1	Laboratory Course based on theory	1	2
	Core -9	RTUDTC2	Poultry Production Techniques	4	4
	Core -9 Practical	RTUDLC2	Laboratory Course based on theory	1	2
	Core - 10	RTUDTC3	Plant Morphology and Reproduction	4	4
	Core -10 Practical	RTUDLC3	Laboratory Course based on theory	1	2
	Generic Elective -4 (GEII-B)	RTUDTG1	Economic Botany	4	4
	Generic Elective - Practical	RTUDLG1	Laboratory Course based on theory	1	2
	Skill Enhancement Course (SEC -2)	RTUDTA1	Herbal Production Techniques	2	2
	Skill Enhancement Course (SEC -2)	RTUDLA1	Laboratory Course based on theory	2	4
			TOTAL	24	30
SUMMER Internship: 15 days			**Swayam/ Swachchhta / NSS / Industrial/ others**	**2**	**100**

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Semester-wise syllabus for UG Course 2021-2022

SYLLABUS as per LOCF B.Sc. IV SEMESTER		
Course Title: HERBAL PRODUCTION TECHNIQUES		
Course Code: RTUDTA1	**Credit: 02**	**Marks:100**

Learning outcomes

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

- Aware with the vast medicinal flora and their scientific role.
- Gain technical confidence and skills to develop entrepreneurship.

Ayurvedic dosage form – Classification, Extraction- Kwatha, Pachana, Avaleha, Bhawwan, Putapka, Fermentation- Asava & Arista, Arka, Guggulu, Ghrita, Churna, Lepa, Vati and Gutikabhasma, Lauha.

Appartus-Dolyantram, Svedaniyantram, Dhupayantram, Patanayantram, Adhaspatanyantram, Tirgakapatanyantram, Vidhyadharyantum, Putas, Mahaputa, Musha, Hamspakayantram.

Utilisation and development of drugs from plants- Analgesic drugs, anti- inflammatory drugs, hypotensive drugs, antimalerial drugs, anti-cancer drugs, cardiovascular drugs, bronchodilatory drugs.

Herbal Preparations- Triphala churna, sitopaladi churna, Preparation of Avleha- Chyawanprash, Preparation of Asawas- Drakshasava, Preparation of Tooth powder, Preparation of beauty products.

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUDLA1	**Credit:02**	**Marks:100**

1. Study of equipments used in preparation of ayurvedic formulations.
2. Preparation of Triphala/Sitopaladi/Lawanbhaskar churna
3. Preparation of tooth powder.
4. Preparation of Hair oil/pain killer oil.
5. Preparation of herbal products.
6. Preparation of Awaleha.

IV	Core-8	RTUDTC1	Rural Social Structure and Planning	4	4
	Core -8 Practical	RTUDLC1	Laboratory Course based on theory	1	2
	Core -9	RTUDTC2	Poultry Production Techniques	4	4
	Core -9 Practical	RTUDLC2	Laboratory Course based on theory	1	2
	Core - 10	RTUDTC3	Plant Morphology and Reproduction	4	4
	Core -10 Practical	RTUDLC3	Laboratory Course based on theory	1	2
	Generic Elective -4 (GEII-B)	RTUDTG1	Economic Botany	4	4
	Generic Elective - Practical	RTUDLG1	Laboratory Course based on theory	1	2
	Skill Enhancement Course (SEC -2)	RTUDTA1	Herbal Production Techniques	2	2
	Skill Enhancement Course (SEC -2)	RTUDLA1	Laboratory Course based on theory	2	4
			TOTAL	24	30
SUMMER Internship: 15 days			**Swayam/ Swachchhta / NSS / Industrial/ others**	**2**	**100**

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SYLLABUS as per LOCF B.Sc. IV SEMESTER		
Course Title: PLANT MORPHOLOGY AND REPRODUCTION		
Course Code: RTUDTC3	**Credit: 04**	**Marks:100**

Learning outcomes

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

- Identify plants on the basis of morphological feature up to species level.
- Understand basic knowledge of plant reproduction.
- Learn seed development and seed dispersion mechanism.

General structure of higher plants, Characteristic feature of Gymnosperm and Angiosperm, Plant morphology- Morphological features of root, and stem; modification of stem and root, morphological adaptations; Vegetative and floral morphological features.

Types of Tissue and cells: Meristmatic and permanent tissues, Gland and ducts; Anatomy of angiospermic (monocot and dicot) stem and root, Vascular cambium – structure and function, seasonal activity.

Phyllotaxy: Leaf morphology (terminology)- Arrangement- Phyllotaxy, and Venation; Inflorescence: Racemose, Cymose and Special types with examples.

Structural organization of flower: Structure of anther and pollen; Structure of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac. Pollination and fertilization: Pollination mechanisms and adaptations; Double fertilization.

Embryo and endosperm: Endosperm types, structure and functions; Dicot and monocot embryo; Fruits: Simple, Aggregate and Multiple types, Seed-structure appendages and dispersal mechanisms.

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUDLC3	**Credit:01**	**Marks:100**

1. Preparation of temporary double stained slides of T.S. of stem, root, leaf.
2. Study of permanent slides of T.S. of monocot and dicot stem and root.
3. Study of abnormal secondary growth with help of permanent slides V. S., entire and V. S. of ovule.
4. Study of types of tissues: Temporary and Permanent.
5. Study of types of leaves, venation, vain islet number and stomata count.
6. Study of flower, fruits and seeds of available plants.

Semester	Course Opted	Course Code	Name of the course	Credit	Hour / week
V	Core-11	RTUETC1	Land Surveying, Leveling and Drawing	4	4
	Core -11 Practical	RTUELC1	Laboratory Course based on theory	1	2
	Core -12	RTUETC2	Building Construction Material and Rural Infrastructure	4	4
	Core -12 Practical	RTUELC2	Laboratory Course based on theory	1	2
	Discipline Specific Elective-1A	RTUETD1	Goat and Pig Production Techniques	4	4
	Practical	RTUELD1	Laboratory Course based on theory	1	2
	OR				
	Discipline Specific Elective-1B	RTUETD2	Rural Entrepreneurship and Management	4	4
	Practical	RTUELD2	Laboratory Course based on theory	1	2
	Discipline Specific Elective-2A	RTUETD3	Natural Product Management	4	4
	DSE-2 - Practical	RTUELD3	Laboratory Course based on theory	1	2
	OR				
	Discipline Specific Elective-2B	RTUETD4	Agricultural Equipments and Crop Production	4	4
	DSE-2 - Practical	RTUELD4	Laboratory Course based on theory	1	2
			TOTAL	20	24

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SYLLABUS as per LOCF B.Sc. V SEMESTER		
Course Title: NATURAL PRODUCT MANAGEMENT		
Course Code: RTUETD3	**Credit: 04**	**Marks:100**

Learning outcome:
On completion of this course, the students will be able to:

- Understand non timber forest products and their importance.
- Develop understanding of grasses of economic importance.
- Identify the common natural products of plant origin and its production and processing.

Definition, contribution of natural products for National Economy, important non timber products of forest area, and their role in rural economy and livelihood.

Classification and use of grasses, bamboos and canes. Economic importance of grasses, bamboos and canes. Essential oils. Importance of oils and waxes in rural economy.

Tannes and it uses – Wood tannes, bark tannes, fruit tannes and leaf tannes, Dyes- wood, bark, flower and fruit dyes, root dyes leaf dyes, animal dyes, uses of tannins and dyes in Rural industries,

Gums and Resins- true gumes, hard resins, oleo resins, utilizations of gums and resins, gum and resin tapping. Manufacturing of turpentine, katha, cutch and charcoal.

Management of Natural Products- collection, storage, utilization pattern of non timber products and their marketing.

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUELD3	**Credit:01**	**Marks:100**

1. Study of local Non timber forest products (NTFPs).
2. Preparation of dyes.
3. To study the source of Tannes, gum and resins.

Semester	Course Opted	Course Code	Name of the course	Credit	Hour / week
V	Core-11	RTUETC1	Land Surveying, Leveling and Drawing	4	4
	Core -11 Practical	RTUELC1	Laboratory Course based on theory	1	2
	Core -12	RTUETC2	Building Construction Material and Rural Infrastructure	4	4
	Core -12 Practical	RTUELC2	Laboratory Course based on theory	1	2
	Discipline Specific Elective-1A	RTUETD1	Goat and Pig Production Techniques	4	4
	Practical	RTUELD1	Laboratory Course based on theory	1	2
	OR				
	Discipline Specific Elective-1B	RTUETD2	Rural Entrepreneurship and Management	4	4
	Practical	RTUELD2	Laboratory Course based on theory	1	2
	Discipline Specific Elective-2A	RTUETD3	Natural Product Management	4	4
	DSE-2 - Practical	RTUELD3	Laboratory Course based on theory	1	2
	OR				
	Discipline Specific Elective-2B	RTUETD4	Agricultural Equipments and Crop Production	4	4
	DSE-2 - Practical	RTUELD4	Laboratory Course based on theory	1	2
			TOTAL	20	24

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Semester-wise syllabus for UG Course 2021-2022

SYLLABUS as per LOCF B.Sc. V SEMESTER		
Course Title: AGRICULTURAL EQUIPMENTS AND CROP PRODUCTION		
Course Code: RTUETD4	**Credit: 04**	**Marks:100**

Learning outcomes

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

- Obtain basic knowledge about agriculture equipments, implements and farm machinery for crop production and their management.
- Learn about cropping system and cropping pattern,
- Enhance their knowledge and skills related to package and practices of crop production.
- Calculate the recommended dose of fertilizers and pesticides.

Equipments required for cultivation- Plough, Share, Cultivator, Hoe, harrow and tractor, Sowing equipment, Plant protection equipments, Crop harvesting and threshing implement.

Definition of Agronomy, scope and importance of agronomy, classification of crops, concepts and types of cropping systems, intensive cropping, crop rotation, mono-cropping, sole-cropping, alley cropping, contour cropping, jhum and shifting cultivation.

Package of practices of Cereal Crops Production: Paddy, Wheat, Maize, Barley, Sorghum. Pulses crops: Groundnut, Pigeon pea, Green and Black Gram, Chickpea, oil crop-Sunflower, Soybean, Mustard, cash crop- Sugarcane and Cotton.

Water management- concepts of water use efficiency, irrigation methods and drainage system.

Weeds- Definition, Identification, classification and spread of different weeds, integrated weed management (IWM).

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUELD4	**Credit:01**	**Marks:100**

1. Identification of agricultural equipments.
2. Identification of weeds.
3. Identification of important crop varieties.
4. Visit to agricultural forms.
5. Calculation of recommended dosage of fertilizers and pesticides.

VI	Core-13	RTUFTC1	Introduction to Remote Sensing	4	4
	Core -13 Practical	RTUFLC1	Laboratory Course based on theory	1	2
	Core -14	RTUFTC2	Introduction to Medicinal Plants	4	4
	Core -14 Practical	RTUFLC2	Laboratory Course based on theory	1	2
	Discipline Specific Elective -3A	RTUFTD1	Rural Energy Resources	4	4
	DSE - 3A Practical	RTUFLD1	Laboratory Course based on theory	1	2
	OR				
	Discipline Specific Elective -3B	RTUFTD2	Watershed Management	4	4
	DSE - 3BPractical	RTUFLD2	Laboratory Course based on theory	1	2
	Any two from DSE4/5/6				
	Discipline Specific Elective-4*	RTUFTD3	Rural Health Care	4	4
	DSE-4* Practicals	RTUFLD3	Laboratory Course based on theory	1	2

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SYLLABUS as per LOCF B.Sc. VI SEMESTER		
Course Title: WATERSHED MANAGEMENT		
Course Code: RTUFTD2	**Credit: 04**	**Marks:100**

Learning outcomes

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

- Learn the soil and water conservation techniques.
- Understand knowledge about watershed management.
- Promote soil and water conservation in the society.

Hydrological cycle, rainfall and its measurement, ground and surface recharge, water conservation and recycling.

Concept of land and water management, soil and water erosion, Runoff erosivity factor, erodibility factor.

Watershed management concept- objectives, types, characterization, planning and execution, suitable plants and crops for watershed area, study of water basin.

Water harvesting structures: Gabian structure, percolation tank, Contour trench, check dam, stop dam, Bench Terracing, Zing terracing, trenching, Gully control.

Introduction to integrated watershed management programme and their impact, Application of Remote Sensing & GIS in watershed management for Natural Resource Management, projects related with surface water managements.

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTUFLD2	**Credit:01**	**Marks:100**

1. Visit to watershed area and identification of problems.
2. Preparation of various models for watershed management.
3. Watershed Map preparation through remote sensing.

Master of Science of Rural Technology

M. Sc. I SEMESTER

Subject Code	Course	Marks Distribution			Marks
		Theory	Sessional	Practical	
RTPATC1	Concepts of Statistical Analysis	70	30	-	100
RTPALC1	Laboratory Course (Based on RTPATC-1)	-	30	70	100
RTPATC2	Innovation, Appraisal and action for Rural Development	70	30	-	100
RTPALC2	Field based work/ Survey (Based on RTPATC-2)	-	30	70	100
RTPATG1	Sericulture	70	30	-	100
RTPALG1	Laboratory Course (Based on RTPATG-1)	-	30	70	100
	OR				
RTPATG2	Lac production technique	70	30	-	100
RTPALG2	Laboratory Course (Based on RTPAGT-2)	-	30	70	100
RTPATO1	Natural Product and Processing Techniques	70	30	-	100
RTPALO1	Laboratory Course (Based on RTPATO-1)	-	30	70	100
	OR				
RTPATO2	Food Preservation techniques	70	30	-	100
RTPALO2	Laboratory Course (Based on RTPATO-2)	-	30	70	100
	Total	280	240	280	800

Syllabus

2021-22

Master of Science of Rural Technology

SYLLABUS as per LOCF **M.Sc. I SEMESTER**		
Course Title: CONCEPTS OF STATISTICAL ANALYSIS		
Course Code: RTPATC1	**Credit: 04**	**Marks:100**

Learning outcomes

On completion of the course, the students will be able to:

- Understand concepts of statistics and its applications in various fields.
- Analyze the data and interpret it in logical manner.

Introduction, concept, meaning, definition and importance of statistics, concept of variables, data coding and decoding, classification (parametric and non parametric), tabulation, graphical and diagrammatic representation of numerical data.

Measurement of central tendency- mean, mode, median, dispersion- Mean deviation, Standard deviation.

Probability Concept, various definition of probability, Addition theorem of probability, Probability distributions (viz. Binomial, Poisson and normal) and their applications.

Coefficient of Variation, Skewness and Kurtosis, Correlation and Regression Analysis, Analysis of variance (ANOVA).

Sampling Methods- Statistical Test Hypothesis, Barrier test- z, t, F and Chi square distribution.

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTPALC1	**Credit:02**	**Marks:100**

1. Coding and decoding of data.
2. Problems based measurement of central tendency.
3. Problems based measurement of dispersion
4. Testing of hypothesis.
5. Analysis of variance (ANOVA).
6. To study the statistical software.
7. Graphical representation of numerical data

M. Sc. II SEMESTER

Subject Code	Course	Marks Distribution			Marks
		Theory	Sessional	Practical	
RTPBTC1	Fundamentals of Medicinal Plant	70	30	-	100
RTPBLC1	Laboratory Course (Based on RTPBTC-1)	-	30	70	100
RTPBTC2	Concept of Remote Sensing and GIS-I	70	30	-	100
RTPBLC2	Laboratory Course (Based on RTPBTC-2)	-	30	70	100
RTPBTA1	Research Methodology and Ethics	70	30	-	100
RTPBLA1	Laboratory Course (Based on RTPBTA-1)	-	30	70	100
RTPBTG1	Rural Waste Management	70	30	-	100
RTPBPG1	Laboratory Course (Based on RTPBTG-1)	-	30	70	100
	OR				
RTPBTG2	Soil and Water Conservation Engineering	70	30	-	100
RTPBPG2	Laboratory Course (Based on RTPBTG-2)	-	30	70	100
	Total	280	240	280	800

SYLLABUS as per LOCF M.Sc. II SEMESTER		
Course Title: RESEARCH METHODOLOGY AND ETHICS		
Course Code: RTPBTA1	**Credit: 02**	**Marks:100**

Learning outcomes

On completion of the course, the students will be able to:

- Understand the nature, types and importance of research methodology and ethics.
- Apply research methodology procedures according to their nature of research.

Research, types of research, Nature, scope of research and importance of research methodology, steps of scientific inquiry and study of social phenomenon, research problems, criteria for identification of research problems, formulations and statement of research objectives.

Hypothesis- Meaning and role in research, type of hypothesis, testing of hypothesis, method of data collection, level of measurement, data sources; observational and survey methods, case studies, types of schedule, questionnaires.

Research design- Exploratory, descriptive, and experimental research design, qualitative and quantitative research. Complete Randomized Block Design (CRD), Randomized Block Design (RBD), Latin Squares Design (LSD) and factorial design.

Research reporting and scientific writing- Preparation of research proposal, compilation of thesis, dissertation, compiling bibliography, reports, compilation of research paper, paper presentation, research ethics.

Course Title: LABORATORY COURSE BASED ON THEORY		
Course Code: RTPBLA1	**Credit:02**	**Marks:100**

1. To study the identification of research problems.
2. To study the objective formation process.
3. Formulation and testing of hypothesis.
4. To study the review and references writing styles.
5. To study the dissertation/thesis writing style/research paper/manual.
6. Research paper presentation skills.