

**Centre
of
SCIENCE AND SOCIETY
(RURAL TECHNOLOGY AND DEVELOPMENT)**

**{M.Sc. Design and Innovation in Rural Technology
(Four Semesters) Programme}
(Syllabus)**



**UNIVERSITY OF ALLAHABAD
ALLAHABAD: 211002**

**ORDINANCE FOR M.Sc. IN RURAL TECHNOLOGY AND DEVELOPMENT BASED
ON SEMESTER SYSTEM, FACULTY OF SCIENCE
UNIVERSITY OF ALLAHABAD**

1. The admission to the course of M.Sc. degree in Rural Technology and Development is open to any candidate who has earned Bachelor degree under 10+2+3 pattern of education with Botany discipline of any Indian University or any accredited institution or any foreign University which the academic council of the University of Allahabad may recognize from time to time for this purpose.
2. The candidates shall be admitted through the entrance test conducted by the University followed by Group discussion and Personal Interview at the Centre in the ratio of 60:40 (60% marks entrance test conducted by University, 30% group discussion and 10% for Personal interview). There shall be separate merit lists for General, OBC and SC/ST candidates.
3. The total number of the candidates admitted to this course will be 15 (Fifteen) and the number may vary from time to time according to the directives of the University.
4. The course shall consist of theory papers and practical based on these papers spread over four semesters.

RULES AND REGULATIONS

EXAMINATION, EVALUATION AND THE MARKING SYSTEM

1. The examination shall be held at the end of each semester and results announced thereafter.
2. Each paper shall carry 100 marks, out of which the written paper shall be of 60 marks and internal assessment of 40 marks, to be awarded on the basis of class attendance, class assessment and written assignment.
3. The practical shall be conducted at the end of each semester and shall carry 100 (40% internal and 60% external assessment as per CBCS) marks each.
4. For passing a semester examination and for promotion to the next semester (from first to the second semester, from the second to the third semester, and from the third to the fourth semester), a student shall have to obtain a minimum of 36% marks in each paper of theory and practical examination and dissertation/thesis (applicable in fourth semester), and a minimum of 48% marks in the aggregate.

(Provided that in respect of the student who have completed and passed all the four semesters of M. Sc. programme in aforesaid manner, subject to compliance with the provision of Clause 10, the division shall be declared on the basis of total marks scored in all four semesters as follows):

Percentage to Grade & Grade Point Conversion

% Marks Obtained	Gr. Point	Grade	Classification
Marks > 80	10	O	Out standing
Marks > 73 & ≤ 80	9	A+	Excellent
Marks > 66 & ≤ 73	8	A	Very Good
Marks > 59 & ≤ 66	7	B+	Good
Marks > 52 & ≤ 59	6	B	Above Average
Marks > 45 & ≤ 52	5	C	Average
Marks > 40 & ≤ 45	4	P	Pass
Marks < 40	0	F	Fail
ABSENT	0	Ab.	Absent

5. In case, a student fails to score 36% marks in not more than two papers in semester and in not more than four papers at a time, but scores average of 48% marks or more than in the remaining papers of the semester concerned, he/she shall be promoted to the next semester (from first to the second semester, from the second to the third semester, and from the third to the fourth semester), subject to the condition that he or she shall reappear in such paper (s) at the respective semester examinations of the ensuing academic session and secure such marks so as to comply with the provisions of Clause 4 subject to compliance with the provisions of Clause 10.

(Provided that in case a student who has reapared in the aforesaid manner fails to comply with the provisions of Clause 4, he/she shall be promoted to the next semester and allowed to reappear in such paper (s) at respective semester examinations of immediately ensuing academic session, to fulfill the condition of Clause 5 subject to the compliance with the provisions of Clause 10.)

6. In case a student has scored 36% marks or more marks in all the papers in a semester but fails to score 48% in aggregate he/she shall be promoted to the next semester (from first to the second semester, from the second to the third semester, and from the third to the fourth semester) subject to the condition he/she will reappear in not more than two papers of the semester at the examination of the ensuing academic session, so as to comply with provisions of Clause 4 subject to the compliance with the provision of Clause 10.

(Provided that in case a student who has reappeared in the aforesaid manner fails to comply with provisions of Clause 4, he/she shall be promoted to the next semester and allowed to re-reappear in such paper (s) at the respective semester examination of the immediately ensuing academic session, to fulfill the condition of Clause 6 subject to the compliance with provision of Clause 10.)

7. In case, a student fails to score 36% marks in more than two papers in a semester and 48% marks in the aggregate in a semester, he/she shall be declared failed in a semester concerned

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and shall have to appear as an ex-student in all the papers in the respective semester examination of immediately ensuing academic session as secure such marks so as comply with provisions of Clause 4, 5 or 6 to get promoted as a regular student to the next and subsequent semester subject to the compliance with the provision of Clause 10.

- 8.** In case of student reappearing in the examinations as per provisions of Clause 5 or 6 or appearing as an ex-student as per provisions of Clause 7, his/her internal assessment marks shall be carried forward to the next examination.
- 9.** The final result (pass/fails and the division obtained) shall be determined at the end of successful clearance of all the four semesters.
- 10.** A student shall be eligible for award of M. Sc. Degree on his/her clearing all the four semesters within four academic sessions from the session of his/her initial enrollment in the programme.

OBJECTIVE

ORIGIN-To begin with a course dedicated towards overall development of rural technology, the Centre of Rural Technology and Development {M.Sc. (Four Semesters) Programme} under the Coordinator-ship/ Directorship (Honorarium basis) in Department of Botany, University of Allahabad, efforts will be made to retrieve funds under **CSR** (Corporate- Social Responsibility) from Coal India, NTPC, IFFCO, and Private Industry *viz.*, Kirloskar, Mahindra Tractors, Monsanto etc. In addition to this, the Ministry of Rural Technology and Ministry of Small and Medium Scale Industries, Govt. will also render support in establishing an independent centre of Rural Technology and Development which will incorporate advancement of technological and social aspect of rural development.

OBJECTIVES AT A GLANCE

- Assessment of rural area and people.
- Rural Entrepreneurships (self-employment through sericulture, lac farming, flower farming, mushroom culture, bee keeping, preparation of natural dyes, bio composting, E-waste management, Biofertilizers etc.).
- Safe and eco-friendly technologies promotion and their compatibility amongst villagers.
- Conservation and promotion of indigenous knowledge.
- Socio-nutritional-economic development of indigenous peoples through appropriate integrated technology and awareness.
- Generating awareness regarding government policies (monitoring and documentation).
- Rural planning and implementation of rural development projects.
- To develop skill in students to for aforementioned tasks.

Marks Distribution:

		TEST *	&/or Assignment / Quiz / Seminar/ GD
			20 Marks
(A) Sessional	:	40%	
(B) End Semester	:	60%	
		T1	T2
		10 Marks each Test	

SUMMARIZED SYLLABUS WITH MARKING SCHEME AND CREDITS

SEMESTER- I

Course no.	Marks	Course title	Credits
RTD- 501	100	Introduction to Rural Technology and development	3
RTD- 502	100	Rural Empowerment	3
RTD- 503	100	Models of Rural Development	3
RTD- 504	100	Global approach in Rural technology	3
RTD- 531	100	Practical of RTD- 501 and RT- 502 (Training programme/Project work)	4
RTD- 532	100	Practical of RTD- 503 and RT- 504 (Village Exposure)	4
Total			20

SEMESTER- II

Course no.	Marks	Course title	Credits
RTD- 505	100	Natural resource management practices in India	3
RTD- 506	100	Production and Post- harvest management	3
RTD- 507	100	Innovation in productivity and Sustainable management	3
RTD- 508	100	Commercial production technologies	3
RTD- 533	100	Practical of RTD- 505 and RT- 506	4
RTD- 534	100	Practical of RTD- 507 and RT- 508	4
Total			20

SEMESTER- III

Course no.	Marks	Course title	Credits
RTD-509	100	Health Scenario of Rural India	3
RTD- 510	100	History of Indian traditional Medicine	3
RTD- 511	100	Health and nutrition	3
RTD-512	100	Integrated Rural Health Management	3
RTD- 535	100	Practical of RTD- 509 and RTD- 510 (Medical based Field work survey)	4
RTD- 536	100	Practical of RTD- 511 and RTD- 512 (Village Survey for Endemic Diseases)	4
Total			20

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SEMESTER- IV

Course no.	Marks	Course title	Credits
RTD- 513	100	Economic status of Rural India	3
RTD- 514	100	Rural Entrepreneurship	3
RTD- 515	150	Dissertation/Thesis	5
RTD 551-RTD-554	100	Elective Papers	3
RTD-538-RTD-541	50	Practical based on Elective Papers	2
RTD- 537	100	Practical of RTD- 513 and RTD- 514	4
Total			20

Elective Papers

Course Code	Marks	Elective*	Credits
RTD 551	100	Rural Entrepreneurship	3
RTD 552	100	Rural Health Management	3
RTD 553	100	Commercial Production Technologies	3
RTD 554	100	IT in Rural Development	3
RTD 538	50	Field Work based on Course RTD 551	2
RTD 539	50	Field Work based on Course RTD 552	2
RTD 540	50	Field Work based on Course RTD 553	2
RTD 541	50	Field Work based on Course RTD 554	2
Total			20

DETAILED SYLLABUS FOR THE 2- YEAR POST- GRADUATE COURSE RURAL TECHNOLOGY AND DEVELOPMENT

SEMESTER- I Syllabus

RTD- 501- Introduction to Rural Technology and development

UNIT- I Indian Rural society – Nature and Characteristics, Factors of Indian Society- Tribal- Rural- Urban- Rural Urban continuum. Sustainable Development, Globalization, Social Welfare, Social Work

UNIT- II Demography of rural areas, British setup and independent Indian setup, Rural Social structure, Problems of Weaker Sections, Social Problems in India: Population Explosion, Unemployment, Poverty, Gender Discrimination and Inequality, Farmers' suicide, Violation of Human Rights and Women in rural society.

UNIT- III Educational and cultural setup in various parts of the country, administrative setup, link up with district headquarters, Concept and meaning of Adult & Non-formal Education. Andragogy and Pedagogy.

UNIT- IV Rural Institutional Systems, Religious- Concept, Nature, Function and its Changing Structure, Education- Objectives, Functions and Importance, Co-operation- Concept, Nature, Scope, Role and Significance in Rural Development.

UNIT- V Different education commissions of India and their recommendations.

RTD- 502- Rural empowerment

UNIT- I Great Educators and their methods: Upanishadic Rishis, Booker Education in Rural areas, Education with emphasis on Primary and secondary education. Major Social Reformers and their Work: Raja Ram Mohan Roy, Mahatma Jotiba Phule

UNIT- II Brief History of Adult Education- influence of Paulo Frere Pre-Independence and Post Independence efforts in India, Adult Education Programme since 1978 and latest Development.

UNIT- III Concept of Rural technology development, Scope of Rural technology, Causes of Rural Backwardness, Need for Rural technology Development and its Constraints.

UNIT- IV Rural Education with emphasis on Primary, Adult and Community Education, Development of Rural Women and Children- Status and Development Strategies

UNIT- V Different Rural Commissions of India from pre independence to till date.

RTD- 503- Models of Rural development

UNIT- I Paradigms of Rural Development- Lewis Model of Economic Development, Self Help Group- Concept, Characteristics and Functions, Swarnajayanti Gram Swarajgar Yojana (SGSY)- Salient features of SGSY, Nature and Scope.

UNIT- II Experiments in Rural Development before independence: Sriniketan, Martandam, Sevagram, Baroda, Firka Development, Nilokheri and Etawa Pilot Project.

UNIT- III 'Big Push' theory of Development, Myrdal's thesis of 'Spread and Backwash Effects. Indicators of Development & Rural Development and their measurements.

UNIT- IV Gandhian Model of Rural Development, Important issues in Rural Development- Human Resource Development in Rural Development.

UNIT- V Agro Based Industries- Concept, Types, Functions and Importance in Rural Employment Generation.

RTD- 504- Global approach in Rural technology

UNIT- I Concept of rural technology and growth in general, Distinction between growth and Development, Indicators of Development, Measures of Development, Sustainable Rural Development.

UNIT- II Poverty and Unemployment Rural Development and Environmental Protection, Participatory rural development.

UNIT- III Rural development Experiences in Asian countries - Need of Rural Development in Asian Countries, Rural Development in China.

UNIT- IV Success of Grameen Model in India, approaches to Rural Development in India.

UNIT- V Role of Panchayati Raj Institutions in Rural Development with special reference to Indian constitution. Land Acquisition Bill.

RTD- 531- Practical of RTD- 501 and RTD- 502

Exposure visit to a village for the establishment of rapport. Exposure visit to a State Agricultural University. A case study on the beneficiaries of any rural development programmes. A compulsory exposure for training programme/project work.

RTD- 532- Practical of RTD- 503 and RTD- 504

Exposure visit to any NGOs/Govt. agencies engaged in rural development activities. Conducting socio-economic surveys in the villages to understand the social structure, tribal social system, their values and norms. Survey of a village to find out the major problems. Identification of social changes in the villages.

SEMESTER- II Syllabus

RTD- 505- Natural resource management practices in India

UNIT- I Types and classification of natural resource, factors influencing resource availability, ecological, social and economic dimension of resource management

UNIT- II Land resources: Land as a resource. Dry land, land use classification, land degradation, man induced landslides, soil erosion and desertification.

UNIT-III. Forest resources: forest vegetation, status and distribution, major forest types and their characteristics. Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people, forest management.

UNIT-IV- Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Water ecology and management.

UNIT-V - Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

RTD- 506- Production and Post- harvest management

UNIT- I Plant Protection - Plant disease, Plant pests' needs for its control, biological control of pests. Integrated Weed management. Agricultural Development under the Plans, Organizational Aspects of Agriculture: Land Reforms, Agro-forestry

UNIT- II Impact of Information Technology on development, growth and governance, satellite communication and remote sensing, geo-informatics application, geospatial information technologies, Information Technology in Agriculture,

UNIT- III Rural Industrialization- Concept, Importance of Rural Industrialization, Village and Cottage Industries, Livestock production, breeding and maintenance (poultry, goatry and piggery).

UNIT- IV Importance and scope of vegetables in India. Identification of vegetables & their seeds, improved nursery raising, sowing & transplanting of vegetables.

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UNIT- V Aquaculture and Fisheries industry in rural setup specially culture and rearing of Carp, Crab, Poly culture, Pearl culture etc. Different government schemes related to fisheries.

RTD- 507- Innovation in productivity and Sustainable management

UNIT- I **Basic Botany-** Classification, Morphology and Anatomy of Plants, Main fruits grown in rural places, Orchard Management practices, Processing and marketing of fruits,

UNIT- II Preparation of Nursery, Importance of cultivation of selected medicinal and aromatic plants. Propagation, planting methods, Bonsai Technology.

UNIT- III **Bee-keeping:** Detailed study of honey bee, its various species and their habits, Rearing techniques of honey bee, Difference between traditional and modern bee keeping. Care and management of bee hive, bee wax and honey; and their utility. Economics of bee keeping.

UNIT- IV **Lac Culture, Tasar culture and Sericulture:** Importance of lac Cultivation, its species, management of pests & diseases of lac insects. Marketing of lac.

UNIT- V Different emerging rural industrial technologies, their applications: Horticulture, Floriculture, Pomology, Olericulture; production and possibilities in global economy etc.

RTD- 508- Commercial production technologies

UNIT- I Commercial production technologies-nature, concept, applications and recent technical advancement.

UNIT- II **Mushroom Cultivation:** Morphology and life-cycle, Importance of mushroom as a health food, a cash crop and eco- friendly commodity, Wild and cultivated mushroom, Edible and poisonous types, Tropical and temperate species, Mushroom spawns, media and substrate for different species.

UNIT- III **Biofertilizers:** Bacterial, algal and fungal, Production technology and post-harvest handling of fresh and processed products and their marketing.

UNIT- IV **Vermicomposting:** Principles and functions of Vermicomposting, Biological mechanism of Vermicomposting, large- scale and small- scale production of vermicomposts.

UNIT- V **Biopesticides and Biosupplements;** herbal soaps, fumigants and hygienic products.

RTD- 533- Practical of RTD- 505 and RTD- 506

Identification of various crops of kharif, rabi and zaid season and seed requirement. Familiarization with various chemicals like- fertilizers, pesticidals, herbicides, insecticides and fungicides. Calculation of fertilizer and pesticides doses. Use of farm implements & equipments. Identification of some important weeds, diseases and pests. Working at organic plots. Analysis of decomposition patterns of animal waste & agro-residuals. Nutrient value of common animal wastes and agro-residues as potential manures.

RTD- 534- Practical of RTD- 507 and RTD- 508

Bee-keeping: Identification and use of commonly used equipments in bee keeping, Identification of queen, drone and worker cells, Occupants of bee colony and the role of individual. Lac Culture, Tasar culture and Sericulture: Identification and description of various host plants of lac, tasar and sericulture, Rearing of lace, tsar and silk worm and cocoon maintenance. Mushroom Cultivation: Pure culture of mushroom---preparation and maintenance of inoculum Dairy: Substrate formulations, composting and pasteurization. Vermicomposting: Preparation and demonstration.

SEMESTER- III Syllabus

RTD- 509- Health Scenario of Rural India

UNIT- I Basic concept of health. Dimensions of health --- physical, psychological, emotional and spiritual—their relationship- knowledge, attitude and practice

UNIT- II Health education in rural areas, Status in Rural India.

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UNIT- III Infant, Child and Maternal Mortality, Health Services in Rural Areas, Structure, Accessibility, Maternal and Child Health.

UNIT- IV Government Policies: Health and Environment

UNIT- V Determinants of Rural Health, Health informatics, Gender Sensitization, girls foeticide

RTD- 510- History of Indian traditional Medicine

UNIT- I History of Indian system of medicine viz. Ayurveda, Siddha, Surgery etc.

UNIT- II Different methods for prevention of diseases, use of medicinal plants in rural areas.

UNIT- III Simple physical and breathing exercise, Acupressure, yoga and other techniques based on traditional knowledge and wisdom for sound health and sound mind.

UNIT- IV WHO's approach to deal with Rural Health and Sanitation, Primary Health Care (PHC), Immunization, Appropriate treatment against serious acute ailment such as diarrhoea, dehydration, and health care for the vulnerable groups.

UNIT- V Local health traditions, primary health care, medicinal plant garden for conservation and utilization of medicinal plants; Scientific documentation of traditional and indigenous knowledge related to plants used for healthcare.

RTD- 511- Health and nutrition

UNIT- I Preparation of Oral Rehydration Solution (ORS) Appropriate Health delivery system in rural area.

UNIT- II Affordable treatment for common ailments and injuries first aid etc. Human Nutrition and Nutrition Education.

UNIT- III Socio-economic factors influencing health and nutrition. Basic requirement of nutrition for human body.

UNIT- IV Nutritional value in different components of food available in rural areas. Deficiency-diseases and various nutritional supplements.

UNIT- V Women health in Rural India; factors, Sex ratio. Health neglect and its changing scenario in the context of government programme. Mortality and morbidity factors influencing nutrition and health.

RTD- 512- Integrated Rural Health Management

UNIT- I Safe Drinking water, Concept and need, Rural technology to get safe drinking water, Different schemes and programmes.

UNIT- II Sanitation: Personal hygiene and environmental hygiene—concept and need, Different measures of sanitation, Sanitation programme and implementation.

UNIT- III Government Health insurance schemes, bank insurance, smart card for BPL families. Various schemes for family, including free vasectomy, single girl child reward, etc.

UNIT- IV Community Health centre schemes and government hospital schemes for poor.

UNIT- V Corporate Social Responsibility: Evidences and The practice of CSR in the context of rural development in India.

RTD- 535- Practical of RTD- 509 and RTD- 510

Health: Practice of physical and breathing exercise, acupressure and yoga. Identification and use of some commonly available medicinal plants. First aid techniques for common injuries and accidents. Visit to a community health centre, primary health centre and sub centre. Preparation of ORS. A field work survey for health care

RTD- 536- Practical of RTD- 511 and RTD- 512

Human Nutrition and Nutrition Education. Preparation of a balanced and nutritional value chart for commonly available fruits and vegetables Safe Drinking water: Preparation of water filter using locally available materials, Use of lime, alum etc. to purify water. Sanitation: Construction

of soak pit, garbage pit, Visit and study of different components of low cost latrines and its construction, Preparation of posters and leaflets for awareness programme. Reporting and recommendation of various human diseases in Rural Area.

SEMESTER- IV Syllabus

RT- 513- Economic status of Rural India

UNIT- I Unemployment and Underemployment in Rural Areas- Problems, Causes.

UNIT- II Poverty- Causes of Rural Poverty, Poverty alleviation programmes in India- Success and Failure analysis. Poverty alleviation through Micro Finance

UNIT- III Empowerment of Rural Women through Self Help Groups. Commercial Banks, Cooperative Banks, NABARD, Rural Insurance.

UNIT- IV Component and classification of rural markets, Rural credit Institutions, Problems in Rural marketing, rural demand. Finance schemes related to economics, Rural Credit – Sources of Credit, Institutional and Non- Institutional, Institutional Credit for Rural Development in India.

UNIT- V Civil Society and NGO Management, Understanding Civil Societies, Role of Civil Societies,

Administrative and financial structure of NGOs, Guideline for NGO Management, NGOs as Society, NGOs as non-profit company, NGOs as Trust.

RTD- 514- Rural Entrepreneurship

UNIT- I Entrepreneurship: Concept of Entrepreneurship, origin and Development of Entrepreneurship. Entrepreneurship Movement in India, role of entrepreneurship in economic development.

UNIT- II Small Industries Development corporation (SIDC), Small Scale industries Board (SSIB), State Small Industries Development Corporations (SSIDC), Technical Consultancy Organizations (TCOs).

UNIT- III Rural Entrepreneurship: Meaning of rural entrepreneurship, need for rural entrepreneurship, problems of rural entrepreneurship, NGOs and rural entrepreneurship, Training and Development of rural Entrepreneurs.

UNIT- IV Entrepreneurship Development programmes (EDPs): Need for EDPs, Objectives of EDPs, Course content and curriculum of EDPs, Phases of EDPs, Evaluation of EDPs. Project Identification and Selection, Project Formulation and Appraisal.

UNIT- V Agencies Supporting Entrepreneurs: District Industries Centre (DICs), Micro, Small and Medium Enterprise (MSME), National Small Industries Corporation (NSIC)

RTD- 537- Practical of RTD- 513 and RTD- 514

To identify the causes of rural unemployment through survey in villages. Measurement of farm holdings with special reference to land situation and study of land ownership pattern. To study a functional SHG(Self Help Group) to understand method and procedure, record-keeping, linkages and income generating activities. Study of a village market to analyze the marketing chain and its functioning.

RTD 515: Dissertation / Thesis

The topic would be decided by the candidate in consultation with the respective supervisor. Dissertation / thesis will be based on existing branches of botany and the title will be decided keeping the view on the modern aspect in the related discipline. It will be the part of semester IV; however, the title of

dissertation / thesis will be assigned by concerned faculty member/board in the beginning of semester III to provide sufficient time to complete dissertation / thesis.

Elective Papers- (There shall be four elective papers, and student has to opt only one)

BOT551: Rural Entrepreneurship

Credits: 3

UNIT I: Entrepreneurship: Concept, knowledge and skills requirement; characteristic of successful entrepreneurs; role of entrepreneurship in economic development; entrepreneurship process; factors impacting emergence of entrepreneurship; managerial vs. entrepreneurial approach and emergence of entrepreneurship

UNIT II: Starting the venture: generating business idea – sources of new ideas, methods of generating ideas, creative problem solving, opportunity recognition; feasibility study – market feasibility, technical/operational feasibility, financial feasibility; drawing business plan; preparing project report; presenting business plan to investors.

UNIT III: Functional plans: marketing plan – marketing research for the new venture, steps in preparing marketing plan, organizational plan – form of ownership, designing organization structure, job design, manpower planning; Financial plan – cash budget, working capital, Performa income statement Performa cash, perform balance sheet, break even analysis.

UNIT IV: Sources of finance: debt or equity financing, commercial banks, venture capital; financial institutions supporting entrepreneurs; Intellectual Property Rights.

UNIT V: Rural Entrepreneurship: need for rural entrepreneurship, problems of rural entrepreneurship, NGOs and rural entrepreneurship, Training and Development of rural Entrepreneurs

RTD-552: Rural Health Management

Credits: 3

UNIT I: Health Education, health planning & management, school health, health economics Information System, hospital waste management, Disaster management.

UNIT II: Health Status of Women in Rural Area; Nutritional Anaemia; Child Development: Status, education, health, Governmental Programmes for children development.

UNIT III: Epidemiology: Definition & aims Epidemiological approach. Basic measurement in Epidemiology, Types of Epidemiological studies.

UNIT IV: Infectious disease, Investigation of an epidemic of Leptospirosis, Malaria, Dengue in Rural set Up & in post disaster situations, Health advice to travelers, Screening for diseases

UNIT V: Prevention of accidents, investigation of public health problems as relevant to basic sciences for a health officer, First aid.

RTD-553-Commercial production technologies

Credits: 3

Unit-I Commercial production technologies-nature, concept, applications and recent technical advancement.

Unit-II Mushroom Cultivation: Morphology and life-cycle, Importance of mushroom as a health food, a cash crop and eco- friendly commodity, Wild and cultivated mushroom, Edible and poisonous types, Tropical and temperate species, Mushroom spawns, media and substrate for different species.

Unit-III Biofertilizers: Bacterial, algal and fugal, Production technology and post-harvest handling of fresh and processed products and their marketing.

Unit-IV Vermicomposting: Principles and functions of Vermicomposting, Biological mechanism of Vermicomposting, large- scale and small- scale production of vermicomposts.

Unit-V Biopesticides and Biosupplements; herbal soaps, fumigants and hygienic products

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RTD 554-IT in Rural Development

Credits: 3

UNIT-I Elementary knowledge about computer hardware and software, operating system, MS-Office.

UNIT-II Data analysis and appropriate software, Different graph type, operating SPSS

UNIT-III Numerical methods of Data Presentation: Mean, Median, Mode, Standard deviation, Correlation, Regression, Chi Square Test.

UNIT-IV Audio-Visual Aids: Materials and Equipment-Planning Preparation and use of different types of audio-visual aids-Projectors Films-Tape recorder Television.

UNIT-V Introduction of GIS and its components-spatial data organization and management, Remote sensing and its application in rural development.