AGRICULTURE **w.e.f. Academic Session 2016-17**

IV Semester		
AGRO 5221	Crop Production Technology –II *(Rabi Crops)*	2 (1+1)
AHFL 5221	Production Technology for Ornamental Crops, MAP and Landscaping	2 (1+1)
AENGG 5221	Renewable Energy and Green Technology	2 (1+1)
ASOIL 5221	Problematic Soils and their Management	2 (2+0)
AHFR 5221	Production Technology for Fruit and Plantation Crops	2 (1+1)
APB 5221	Principles of Seed Technology	3 (1+2)
AGRO 5222	Farming System & Sustainable Agriculture	1 (1+0)
AEC 5221	Agricultural Marketing Trade & Prices	3 (2+1)
ASTAT 5221	Elementary Statistics and Computer Application	2 (1+1)
AFOR-5221	Environmental Studies & Disaster Management	3 (2+1)
ABM 5221	Agri Business Management	3 (2+1)
Total		**25 (15+10)**

AGRO 5221	Crop Production Technology –II *(Rabi Crops)*	2(1+1)

Theory

Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of *Rabi* crops; cereals –wheat and barley, pulses-chickpea, lentil, peas, oilseeds-rapeseed, mustard and sunflower; sugar crops-sugarcane; medicinal and aromatic crops-mentha, lemon grass and citronella, Forage crops-berseem, lucerne and oat.

Practical

Sowing methods of wheat and sugarcane, identification of weeds in *rabi* season crops, study of morphological characteristics of *rabi* crops, study of yield contributing characters of *rabi* season crops, yield and juice quality analysis of sugarcane, study of important agronomic experiments of *rabi* crops at experimental farms. Study of *rabi* forage experiments, oil extraction of medicinal crops, visit to research stations of related crops.

Theory

1 Origin, geographical distribution, economic importance, soil and climatic requirements-2
2 Varieties,
3 Cultural practices and yield of *Rabi* crops; cereals –wheat and barley2
4 Cultural practices and yield of *Rabi* crops; pulses-chickpea, lentil, peas-2
5 Cultural practices and yield of *Rabi* crops ; oilseeds-rapeseed, mustard and sunflower-2
6 Cultural practices and yield of *Rabi* crops; sugar crops-sugarcane;
7 Cultural practices and yield of *Rabi* crops; medicinal and aromatic crops-mentha, lemon grass and citronella,
8 Cultural practices and yield of *Rabi* crops ;Forage crops-berseem, lucerne and oat.

Practical

1 Sowing methods of wheat and sugarcane,
2 Identification of weeds in *rabi* season crops-2
3 Study of morphological characteristics of *rabi* crops-2
4 Study of yield contributing characters of *rabi* season crops-2
5 Yield and juice quality analysis of sugarcane,
6 Study of important agronomic experiments of *rabi* crops at experimental farms.
7 Study of *rabi* forage experiments,
8 Oil extraction of medicinal crops,
9 Visit to research stations of related crops.

AHFL 5221	Production Technology for Ornamental Crops, MAP and Landscaping	2(1+1)

Theory

Importance and scope of ornamental crops, medicinal and aromatic plants and landscaping. Principles of landscaping. Landscape uses of trees, shrubs and climbers. Production technology of important cut flowers like rose, gerbera, carnation, lilium and orchids under protected conditions and gladiolus, tuberose, chrysanthemum under open conditions. Package of practices for loose flowers like marigold and jasmine under open conditions. Production technology of important medicinal plants like ashwagandha, asparagus, aloe, costus, Cinnamomum, periwinkle, isabgol and aromatic plants like mint, lemongrass, citronella, palmarosa, ocimum, rose, geranium, vetiver. Processing and value addition in ornamental crops and MAPs produce.

Practical

Identification of Ornamental plants. Identification of Medicinal and Aromatic Plants. Nursery bed preparation and seed sowing. Training and pruning of Ornamental plants. Planning and layout of garden. Bed preparation and planting of MAP. Protected structures – care and maintenance. Intercultural operations in flowers and MAP. Harvesting and post harvest handling of cut and loose flowers. Processing of MAP. Visit to commercial flower/MAP unit.

Theory

1 Importance and scope of ornamental crops, medicinal and aromatic plants and landscaping.
2 Principles of landscaping.
3 Landscape uses of trees, shrubs and climbers.
4 Production technology of important cut flowers like rose, gerbera, carnation, lilium and orchids under protected conditions and gladiolus, tuberose, chrysanthemum under open conditions-3
5 Package of practices for loose flowers like marigold and jasmine under open conditions.
6 Production technology of important medicinal plants like ashwagandha, asparagus, aloe, costus, Cinnamomum, periwinkle, isabgol and aromatic plants like mint, lemongrass, citronella, palmarosa, ocimum, rose, geranium, vetiver-4
7 Processing and value addition in ornamental crops and MAPs produce.

Practical

1 Identification of Ornamental plants.
2 Identification of Medicinal and Aromatic Plants.
3 Nursery bed preparation and seed sowing-2.
4 Training and pruning of Ornamental plants.
5 Planning and layout of garden-2.
6 Bed preparation and planting of MAP.
7 Protected structures – care and maintenance.
8 Intercultural operations in flowers and MAP.
9 Harvesting and post harvest handling of cut and loose flowers.
10 Processing of MAP. Visit to commercial flower/MAP unit.

AENGG 5221	Renewable Energy and Green Technology	2(1+1)

Theory

Classification of energy sources, contribution of these of sources in agricultural sector, Familiarization with biomass utilization for biofuel production and their application, Familiarization with types of biogas plants and gasifiers, biogas, bioalcohol, biodiesel and biooil production and their utilization as bioenergy resource, introduction of solar energy, collection and their application, Familiarization with solar energy gadgets: solar cooker, solar water heater, application of solar energy: solar drying, solar pond, solar distillation, solar photovoltaic system and their application, introduction of wind energy and their application.

Practical

Familiarization with renewable energy gadgets. To study biogas plants, To study gasifier, To study the production process of biodiesel, To study briquetting machine, To study the production process of bio-fuels. Familiarization with different solar energy gadgets. To study solar photovoltaic system: solar light, solar pumping, solar fencing. To study solar cooker, To study solar drying system. To study solar distillation and solar pond.

Theory

No.	Title	No of lectures
1	Classification of energy sources, contribution of these of sources in agricultural sector	1
2	Familiarization with biomass utilization for bio fuel production and their application	1
3	Familiarization with types of biogas plants	1
4	Gasifiers	1
5	Bio alcohol, biodiesel and bio oil production and their utilization as bio energy resource	2
6	Introduction of solar energy, collection and their application, Familiarization with solar energy gadgets: solar cooker, solar water heater,	2
7	application of solar energy: solar drying, solar pond, solar distillation, solar photovoltaic system and their application	2
8	Introduction of wind energy and their application.	2

Practical

No.	Title of practical
1	Familiarization with renewable energy gadgets.
2	To study biogas plants- Fixed and floating dome type
3	To study gasifier
4	To study the production process of biodiesel
5	To study briquetting machine.
6	To study the production process of bio-fuels.
7	Familiarization with different solar energy gadgets.
8	To study solar photovoltaic system: solar light, solar pumping, solar fencing. -2
9	To study solar cooker,
10	To study solar drying system.
11	To study solar distillation and solar pond.

ASOIL 5221	Problematic Soils and their Management	2(2+0)

Theory

Soil quality and health, Distribution of Waste land and problem soils in India. Their categorization based on properties. Reclamation and management of Saline and sodic soils, Acid soils, Acid Sulphate soils, Eroded and Compacted soils, Flooded soils, Polluted soils. Irrigation water – quality and standards, utilization of saline water in agriculture. Remote sensing and GIS in diagnosis and management of problem soils.

Multipurpose tree species, bio remediation through MPTs of soils, land capability and classification, land suitability classification. Problematic soils under different Agro-ecosystems.

Theory

1 Soil quality and health-2

2 Distribution of Waste land and problem soils in India. Their categorization based on properties-4

3 Reclamation and management of Saline and sodic soils, Acid soils, Acid Sulphate soils, Eroded and Compacted soils, Flooded soils, Polluted soils-5

4 Irrigation water – quality and standards, utilization of saline water in agriculture-3

5 Remote sensing and GIS in diagnosis and management of problem soils-3.

6 Multipurpose tree species, bio remediation through MPTs of soils, land capability and classification, land suitability classification-4

7 Problematic soils under different Agro-ecosystems-3.

AHFR 5221	Production Technology for Fruit and Plantation Crops	2(1+1)

Theory:

Importance and scope of fruit and plantation crop industry in India; Seed propagation-merits & demerits; Importance of vegetative propagation and rootstocks; Production technologies for the cultivation of major fruit crops-mango, banana, citrus, grape, guava, litchi, papaya, apple, pear, peach, plum, strawberry and minor fruits – aonla, ber, bael, custard apple, pineapple, pomegranate, jackfruit; Plantation crops-coconut, cashew, tea, coffee & rubber.

Practical:

Identification and description of fruit crops; Scarification and stratification of seeds; Vegetative propagation and methods for fruits and plantation crops; Preparation of plant bio-regulators and their uses; Important pests, diseases and physiological disorders of above fruit and plantation crops, Visit to commercial orchards.

Theory:

1. Importance and scope of fruit and plantation crop industry in India.
2. Seed propagation-merits & demerits, Importance of vegetative propagation and rootstocks.
3. Production technologies for the cultivation of major fruit crops – Mango.
4. Production technology – Banana, Papaya.
5. Production technology – Citrus, Grape.
6. Production technology – Guava, Litchi.
7. Production technology – Apple, Pear, Peach, Plum, Strawberry.
8. Production technology – Minor fruits: Aonla, Ber, Bael.
9. Production technology – Pineapple, Pomegranate.
10. Production technology – Jackfruit, Custard apple.
11. Production technology – Plantation crops: Coconut, Cashewnut.
12. Production technology – Tea, Coffee and Rubber (Plantation crops).

Practical:

1. Identification and description of fruit crops.
2. Propagation by Seed.
3. Methods of scarification and stratification of seeds.
4. Methods of vegetative propagation for fruit and plantation crops – 3.
5. Preparation of plant bio-regulators and their uses – 2.
6. Studies on important pests and diseases of fruit and plantation crops –2.
7. Studies on physiological disorders of fruit and plantation crops.
8. Visit to commercial orchards.

APB 5221	Principles of Seed Technology	3(1+2)

Theory

Seed and seed technology: introduction, definition and importance. Deterioration causes of crop varieties and their control; Maintenance of genetic purity during seed production, seed quality; Definition, Characters of good quality seed, different classes of seed. Foundation and certified seed production of important **cereals, pulses, oilseeds, fodder and vegetables**. Seed certification, phases of certification, procedure for seed certification, field inspection. Seed Act and Seed Act enforcement. Duty and powers of seed inspector, offences and penalties. Seeds Control Order 1983, Varietal Identification through Grow Out Test and Electrophoresis, Molecular and Biochemical test. Detection of genetically modified crops, Transgene contamination in non-GM crops, GM crops and organic seed production.

Seed drying, processing and their steps, seed testing for quality assessment, seed treatment, its importance, method of application and seed packing. Seed storage; general principles, stages and factors affecting seed longevity during storage. Measures for pest and disease control during storage. Seed marketing: structure and organization, sales generation activities, promotional media. Factors affecting seed marketing, Role of WTO and OECD in seed marketing. Private and public sectors and their production and marketing strategies.

Practical

Seed production in major cereals: Wheat, Rice, Maize, Sorghum, Bajra and Ragi. Seed production in major pulses: Urd, Mung, Pigeonpea, Lentil, Gram, Field bean, pea. Seed production in major oilseeds: Soybean, Sunflower, Rapeseed, Groundnut and Mustard. Seed production in important vegetable crops. Seed sampling and testing: Physical purity, germination, viability, etc. Seed and seedling vigour test. Genetic purity test: Grow out test and electrophoresis. Seed certification: Procedure, Field inspection, Preparation of field inspection report. Visit to seed production farms, seed testing laboratories and seed processing plant.

Theory

1 Seed and seed technology: introduction, definition and importance.

2 Deterioration causes of crop varieties and their control; Maintenance of genetic purity during seed production, seed quality; Definition, Characters of good quality seed, different classes of seed. Foundation and certified seed production of important **cereals, pulses, oilseeds, fodder and vegetables-2**.

3 Seed certification, phases of certification, procedure for seed certification, field inspection. Seed Act and Seed Act enforcement.

4 Duty and powers of seed inspector, offences and penalties. Seeds Control Order 1983, Varietal Identification through Grow Out Test and Electrophoresis, Molecular and Biochemical test-2.

5 Detection of genetically modified crops, Transgene contamination in non-GM crops, GM crops and organic seed production.

6 Seed drying, processing and their steps, seed testing for quality assessment, seed treatment, its importance, method of application and seed packing.

7 Seed storage; general principles, stages and factors affecting seed longevity during storage. Measures for pest and disease control during storage.

8 Seed marketing: structure and organization, sales generation activities, promotional media.

9 Factors affecting seed marketing, Role of WTO and OECD in seed marketing.

10 Private and public sectors and their production and marketing strategies.

Practical

1 Seed production in major cereals: Wheat, Rice, Maize, Sorghum, Bajra and Ragi-3

2 Seed production in major pulses: Urd, Mung, Pigeonpea, Lentil, Gram, Field bean, pea-3

3 Seed production in major oilseeds: Soybean, Sunflower, Rapeseed, Groundnut and Mustard-3

4 Seed production in important vegetable crops-2.

5 Seed sampling and testing: Physical purity, germination, viability, etc.-3

6 Seed and seedling vigour test-2.

7 Genetic purity test: Grow out test and electrophoresis-2.

8 Seed certification: Procedure, Field inspection-2

9 Preparation of field inspection report-2

10 Visit to seed production farms, seed testing laboratories and seed processing plant2

AGRO 5222	Farming System & Sustainable Agriculture	1(1+0)

Theory

Farming System-scope, importance, and concept, Types and systems of farming system and factors affecting types of farming, Farming system components and their maintenance, Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation, Allied enterprises and their importance, Tools for determining production and efficiencies in cropping and farming system; Sustainable agriculture-problems and its impact on agriculture, indicators of sustainability, adaptation and mitigation, conservation agriculture strategies in agriculture, HEIA, LEIA and LEISA and its techniques for sustainability, Integrated farming system-historical background, objectives and characteristics, components of IFS and its advantages, Site specific development of IFS model for different agro-climatic zones, resource use efficiency and optimization techniques, Resource cycling and flow of energy in different farming system, farming system and environment, Visit of IFS model in different agro-climatic zones of nearby states University/ institutes and farmers field.

Theory

1 Farming System-scope, importance, and concept,
2 Types and systems of farming system and factors affecting types of farming,
3 Farming system components and their maintenance,
4 Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation,
5 Allied enterprises and their importance,
6 Tools for determining production and efficiencies in cropping and farming system;
7 Sustainable agriculture-problems and its impact on agriculture, indicators of sustainability, adaptation and mitigation, conservation agriculture strategies in agriculture, HEIA, LEIA and LEISA and its techniques for sustainability-2
8 Integrated farming system-historical background, objectives and characteristics, components of IFS and its advantages,
9 Site specific development of IFS model for different agro-climatic zones, resource use efficiency and optimization techniques,
10 Resource cycling and flow of energy in different farming system, farming system and environment,
11 Visit of IFS model in different agro-climatic zones of nearby states University/ institutes and farmers field.

AEC 5221	Agricultural Marketing,Trade & Prices	3(2+1)

Theory

Agricultural Marketing: Concepts and definitions of market, marketing, agricultural marketing, market structure, marketing mix and market segmentation, classification and characteristics of agricultural markets; producer's surplus – meaning and its types, marketable and marketed surplus, factors affecting marketable surplus of agri-commodities; exchange functions – buying and selling; physical functions – storage, transport and processing; facilitating functions – packaging, branding, grading, quality control and labeling (Agmark); Market functionaries and marketing channels: Types and importance of agencies involved in agricultural marketing; meaning and definition of marketing channel; marketing channels for different farm products; Integration, efficiency, costs and price spread: Meaning, definition and types of market integration; marketing efficiency; marketing costs, margins and price spread; factors affecting cost of marketing; reasons for higher marketing costs of farm commodities; ways of reducing marketing costs; Role of Govt. in agricultural marketing: Public sector institutions- CWC, SWC, FCI & DMI – their objectives and functions; cooperative marketing in India; Risk in marketing: Types of risk in marketing; speculation & hedging; an overview of futures trading; Agricultural price and policy: Meaning and functions of price; administered prices; need for agricultural price policy; Trade: Concept of International Trade and its need, theories of absolute and comparative advantage. GATT and WTO; an overview Agreement on Agriculture (AoA) and its implications on Indian agriculture; IPR meaning.

Practical

Plotting and study of demand and supply curves and calculation of elasticities; Study of relationship between market arrivals and prices of some selected commodities; Computation of marketable and marketed surplus of important commodities; Visit to a local market to study various marketing functions performed by different agencies, identification of marketing channels for selected commodity, collection of data regarding marketing costs, margins and price spread and presentation of report in the class; Visit to market institutions – SWC, CWC, cooperative marketing society, etc. to study their organization and functioning.

Theory

1 Agricultural Marketing: Concepts and definitions of market, marketing, agricultural marketing, market structure, marketing mix and market segmentation, classification and characteristics of agricultural markets; **-3**

2 Producer's surplus – meaning and its types, marketable and marketed surplus, factors affecting marketable surplus of agri-commodities;-2

3 Product life cycle (PLC) Meaning and stages in PLC;

4 Pricing and promotion strategies;

5 Marketing functions: Marketing

6 Exchange functions – buying and selling; physical functions – storage, transport and processing; facilitating functions – packaging, branding, grading, quality control and labeling (Agmark);

7 Market functionaries and marketing channels: Types and importance of agencies involved in agricultural marketing;

8 Meaning and definition of marketing channel;

9 Marketing channels for different farm products;

10 Integration, efficiency, costs and price spread: Meaning, definition and types of market integration;

11 Marketing efficiency;

12 Marketing costs, margins and price spread;

13 Factors affecting cost of marketing;

14 Reasons for higher marketing costs of farm commodities; ways of reducing marketing costs;

15 Role of Govt. in agricultural marketing: Public sector institutions- CWC, SWC, FCI, CACP & DMI – their objectives and functions;

16 Cooperative marketing in India; Risk in marketing: Types of risk in marketing; speculation & hedging; an overview of futures trading;

17 Agricultural prices and policy: Meaning and functions of price; administered prices; need for agricultural price policy;

18 Trade: Concept of International Trade and its need, theories of absolute and comparative advantage.

19 GATT and WTO;

20 Agreement on Agriculture (AoA) and its implications on Indian agriculture;

21 IPR-meaning

Practical

1 Plotting and study of demand and supply curves and calculation of elasticities;**2**

2 Study of relationship between market arrivals and prices of some selected commodities-2

3 Computation of marketable and marketed surplus of important commodities.-2

4 Visit to a local market to study various marketing functions performed by different agencies, identification of marketing channels for selected commodity, collection of data regarding marketing costs, margins and price spread and presentation of report in the class.-4

5 Visit to market institutions – SWC, CWC, cooperative marketing society, etc. to study their organization and functioning-2

ASTAT 5221	Elementary Statistics and Computer Application	2 (1+1)

Theory

Elements of Statistics

S. No.	Topics	No. of Lectures
1.	Introduction to Statistics: Definition of Statistics, Scope (variable sources of statistics) and Limitations, Classification and tabulation of data, construction of frequency distribution tables Graphical representation of data: Line diagram, Bar diagram, pie diagram, histogram, frequency polygon and frequency curve	01
2.	Measures of location: Concept of measures of location, mean, mode, median, percentiles and quartiles, for raw and grouped data. Measures of Dispersion: Concept of measures of dispersion, Range, standard deviation, variance, coefficient of variation for raw and grouped data.	01
3.	Probability: Definition, Additive and Multiplicative laws (without proof). Simple Problems Based on Probability. Binomial Distribution: Definition of Probability Mass Function, Properties of Binomial distribution, Simple Problems Based on Binomial Distribution	01
4.	Normal Distribution Definition of Probability Density Function, Properties of Norma distribution, Simple Problems Based on Normal Distribution Sampling Methods Introduction, Definition of terms of Sampling, Sampling versus Complete Enumeration, Simple Random Sampling with and without replacement for Mean, Use of Random Number Tables for selection of Simple Random Sample	01
5.	Test of Significance: Null hypothesis, Alternative hypothesis (One tail and Two tail), Degrees of Freedon, Level of Significance, Types of Errors. t-test: One sample & two sample (independent and paired samples) t-test for Means Chi-Square Test: Conditions for validity of Chi square test, Goodness of Fit with examples on Mendelian ratios and Test of Independence of Attributes, Yate's Correction for continuity.	01
6.	Correlation: Definition and Properties of Karl Pearson's Coefficient of Correlation, Scatter Diagram. Regression: Two Linear Regression Equations, Properties of regression coefficient.	01

	Tests of Coefiicients: Significant test of Correlation and Regression coefficients. Experimental Designs: Introduction to Analysis of Variance, Principles of Design, Assumptions of ANOVA, Completely randomized design, Randomized block design.	
	Total	**06**

Practical

S.No.	Topic	No. of Practicals
1.	Frequency distribution: Construction of frequency distribution table. Graphical Representation of Data: Graphical representation of frequency table, Line diagram, histogram, frequency polygon, frequency curve, bar chart, pie chart. Computations of Measures of Location: Mean, mode for raw and grouped data, percentiles, quartiles, and median for raw and grouped data.	02
2.	Measures of Dispersion (Raw Data and Grouped data): Range, Standard Deviation, Coefficient of Variation t-test: t-test for one sample and two independent samples with equal variance, Paired 't' test.	01
3.	Chi-Square test: Chi-square test for contingency tables (for testing independence of attributes), Theoretical ratios (tests as of Goodness of fit of Mendelian ratios) Correlation and Regression: Computations for Correlation and linear regression, namely, Karl Pearson's Coefficient of Correlation for ungrouped data, Fitting of two lines of regressions. Computations involving properties of correlation and regression coefficients for fitting lines etc	02
4.	Analysis of CRD: Computations for analysis of Completely Randomized Design with unequal replications. Analysis of RBD (i.e. RCBD): Computations for analysis of Randomized Block Design (i.e. Randomized Complete Block Design) with unequal replications.	01
	Total	**06**

Computer Applications

Theory

S.No.	Topics	No. of Lectures
1.	Computer components: Display of Computer Components (PC), Display of PC working showing hardware of PC, Basic display of DOS/Windows functionality.	01
2.	Introduction to programming languages: Basic concepts of BASIC language, Programming codes for only calculating Mean and Standard Deviation using. BASIC language	02
3.	Applications of MS-Word: MS Word- Features of word processing, creating document and tables and printing of document.	01
4.	Applications of MS-Excel: MS Excel-Concept of electronic spreadsheet, creating, editing and saving of spreadsheet, inbuilt statistical functions and formula bar.	01
5.	Applications of MS-Power point: MS Power point-preparation, presentation of slides and slide show.	01
	Total	**06**

Practical

S.No.	Topics	No. of Lectures
1.	Computer Applications: Introduction to computers and personal computers, basic concepts, operating system, DOS and Windows.	01
2.	Applications of MS-Word: MS Word- Features of word processing, creating document and tables and printing of document. Applications of MS-Excel: MS Excel-Concept of electronic spreadsheet, creating, editing and saving of spreadsheet, inbuilt statistical functions and formula bar.	01
3.	Applications of MS-Powerpoint: MS Power point-preparation, presentation of slides and slide show..	01
4.	Introduction to programming languages: Basic concepts of BASIC language, Programming codes for only calculating Mean and Standard Deviation using. BASIC language	01
5.	Introduction to Internet: Elementary Concepts, Internet Explorer (IE), Search Engine (Google), Email.	01
6.	Introduction to Multi-Media and its Application:	01

	Meaning of Multimedia, Identifying Multimedia elements (Text, Images, Sound/Audio, Animation, Video), Area of Use of Multimedia.	
	Total	**06**

Suggested Reading:

Gupta, S. C. and Kapoor, V. K. 2014. Fundamentals of Mathematical Statistics. Sultan chand and sons. New Delhi

NageswaraRao,G.2007.*Statisticsfor AgriculturalSciences*. BSPublications,Hyderabad.

Rangaswamy,R.1995.*ATextBookofAgriculturalStatistics*. NewAgeInternationalPublishingLimited, Hyderabad.

Gupta, V.,2002. *ComdexComputerKit*. DreamTechPress,NewDelhi.

Parmar,A.Mathur,N.DeeptiP.U.andPrasanna, V. B.,2000.*WorkingwithWINDOWS A HandsonTutorials*. TataMcGrawHillPublishingCo.,NewDelhi.

Bandari, V. B., 2012. *Fundamentals of Information Technology*. Pearson Education,New Delhi.

Fundamentals of Computers. 2011. Pearson Education-ITL ESL, New Delhi.

AFOR 5211	Environmental Studies and Disaster Management	3(2+1)

Theory

Multidisciplinary nature of environmental studies Definition, scope and importance.

Natural Resources: Renewable and non-renewable resources, Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. • Role of an individual in conservation of natural resources. • Equitable use of resources for sustainable lifestyles.

Ecosystems: Concept of an 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 d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and its conservation: - Introduction, definition, genetic, species & ecosystem diversity and biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels, India as a mega-diversity nation. Hot-sports of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. 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: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards. Solid Waste Management: causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.

Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed

management. Environmental ethics: Issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. dies. 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.

Human Population and the Environment: population growth, variation among nations, population explosion, Family Welfare Programme. Environment and human health: Human Rights, Value Education, HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health.

Disaster Management

Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves, Climatic change: global warming, Sea level rise, ozone depletion.

Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, air pollution, water pollution, deforestation, industrial waste water pollution, road accidents, rail accidents, air accidents, sea accidents.

Disaster Management- Effect to migrate natural disaster at national and global levels. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community –based organizations and media. Central, state, district and local administration; Armed forces in disaster response; Disaster response; Police and other organizations.

Practical

Pollution case studies. Case Studies- Field work: Visit to a local area to document environmental assets river/ forest/ grassland/ hill/ mountain, visit to a local polluted site-Urban/Rural/Industrial/Agricultural, study of common plants, insects, birds and study of simple ecosystems-pond, river, hill slopes, etc.

Theory

1 Multidisciplinary nature of environmental studies Definition, scope and importance.

2 Natural Resources: Renewable and non-renewable resources, natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification-5

3 Role of an individual in conservation of natural resources. • Equitable use of resources for sustainable lifestyles.

4 Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem.

5 Ecological succession, Food chains, food webs and ecological pyramids. Introduction, types, characteristic features,

6 structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

7 Biodiversity and its conservation: - Introduction, definition, genetic, species & ecosystem diversity and biogeographical classification of India.

8 Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels, India as a mega-diversity nation. Hot-sports of biodiversity.

9 Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

10 Environmental Pollution: definition, cause, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards-2

11 Solid Waste Management: causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.

12 Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management.

13 Environmental ethics: Issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. dies.

14 Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act.

15 Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness.

16 Human Population and the Environment: population growth, variation among nations, population explosion, Family Welfare Programme. Environment and human health: Human Rights, Value Education, HIV/AIDS. Women and Child Welfare

17 Role of Information Technology in Environment and human health.

Disaster Management

18 Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves, Climatic change: global warming, Sea level rise, ozone depletion.

19 Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, air pollution, water pollution, deforestation, industrial waste water pollution, road accidents, rail accidents, air accidents, sea accidents.

20 Disaster Management- Effect to migrate natural disaster at national and global levels. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community – based organizations and media. Central, state, district and local administration; Armed forces in disaster response; Disaster response; Police and other organizations.

Practical

1 Pollution case studies. -2
2 Case Studies- Field work: Visit to a local area to document environmental assets river/ forest/ grassland/ hill/ mountain, -2
3 visit to a local polluted -2
4 site-Urban/Rural/Industrial/Agricultural,-2
5 study of common plants, insects, birds -2
6 study of simple ecosystems-pond, river, hill slopes, etc.-2

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Theory

Transformation of agriculture into agribusiness, various stakeholders and components of agribusiness systems. Importance of agribusiness in the Indian economy and New Agricultural Policy. Distinctive features of Agribusiness Management: Importance and needs of agro-based industries, Classification of industries and types of agro based industries. Institutional arrangement, procedures to set up agro based industries. Constraints in establishing agro-based industries. Agri-value chain: Understanding primary and support activities and their linkages. Business environment: PEST & SWOT analysis. Management functions: Roles & activities, Organization culture. Planning, meaning, definition, types of plans. Purpose or mission, goals or objectives, Strategies, polices procedures, rules, programs and budget. Components of a business plan, Steps in planning and implementation. Organization staffing, directing and motivation. Ordering, leading, supervision, communications, control. Capital Management and Financial management of Agribusiness. Financial statements and their importance. Marketing Management: Segmentation, targeting & positioning. Marketing mix and marketing strategies. Consumer behavior analysis, Product Life Cycle (PLC). Sales & Distribution Management. Pricing policy, various pricing methods. Project Management definition, project cycle, identification, formulation, appraisal, implementation, monitoring and evaluation. Project Appraisal and evaluation techniques.

Practical

Study of agri-input markets: Seed, fertilizers, pesticides. Study of output markets: grains, fruits, vegetables, flowers. Study of product markets, retails trade commodity trading, and value added products. Study of financing institutions- Cooperative, Commercial banks, RRBs, Agribusiness Finance Limited, NABARD. Preparations of projects and Feasibility reports for agribusiness entrepreneur. Appraisal/evaluation techniques of identifying viable project- Non-discounting techniques. Case study of agro-based industries. Trend and growth rate of prices of agricultural commodities. Net present worth technique for selection of viable project. Internal rate of return.

Theory

1. Transformation of agriculture into agribusiness, various stakeholders and components of agribusiness systems. 2
2. Importance of agribusiness in the Indian economy and New Agricultural Policy. 2
3. Distinctive features of Agribusiness Management: Importance and needs of agro-based industries, 2
4. Classification of industries and types of agro based industries. Institutional arrangement, procedures to set up agro based industries.
5. Constraints in establishing agro-based industries.
6. Agri-value chain: Understanding primary and support activities and their linkages.
7. Business environment: PEST & SWOT analysis.
8. Management functions: Roles & activities,
9. Organization culture. Planning, meaning, definition, types of plans.
10. Purpose or mission, goals or objectives, Strategies, polices procedures, rules, programs and budget. Components of a business plan,
11. Steps in planning and implementation.
12. Organization staffing, directing and motivation. Ordering, leading, supervision, communications, control. 2
13. Capital Management and Financial management of Agribusiness.
14. Financial statements and their importance.
15. Marketing Management: Segmentation, targeting & positioning.
16. Marketing mix and marketing strategies. Consumer behavior analysis,
17. Product Life Cycle (PLC). Sales & Distribution Management.
18. Pricing policy, various pricing methods.
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20. Project Appraisal and evaluation techniques.

Practical

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