

माननीय विद्वत् परिषद्
की 85वीं बैठक का कार्यवृत्त



स्थान : कुलपति सभा कक्ष
दिनांक : 21.11.2022
समय : अपराह्न 3.30 बजे

कुलसचिव कार्यालय
सरदार वल्लभभाई पटेल कृषि एवं प्रौद्योगिक विश्वविद्यालय,
मेरठ-- 250 110

8	Dr. Meraj Alam Ansari	Scientist	Agronomy	For Teaching and Student Guidance
9	Dr. Raghuveer Singh	Scientist (SS)	Agronomy	For Teaching and Student Guidance
10	Dr. Amrit Lal	Scientist	Soil Science	For Teaching and Student Guidance
11	Dr. Prakash Chand Ghasal	Scientist	Agronomy	For Teaching and Student Guidance
12	Dr. jairam Chaudhary	Scientist	Agricultural Microbiology	For Teaching
13	Dr. Raghavendra K.J	Scientist	Agricultural Economics	For Teaching and Student Guidance
14	Dr. Nirmal	Scientist	Forestry	For Teaching and Student Guidance
15	Dr. V.P. Chaudhary	Principal Scientist	Farm Machinery & Power	For Teaching and Student Guidance

कार्यवाही: अधिष्ठाता सम्बन्धित महाविद्यालय

संकल्प सं०-08

Agenda for Research Priorities of Sardar Vallabhbhai Patel University.

माननीय विद्वत परिषद द्वारा उक्त प्रस्ताव पर चर्चा की गयी तथा यह निर्णय लिया गया कि प्रस्ताव को पुनरीक्षित कर आगामी होने वाली शोध सलाकार समिति (RAC) की बैठक में प्रस्ताव को चर्चा हेतु प्रेषित किया जाय।

कार्यवाही: निदेशक शोध

संकल्प सं०-09

Agenda for Nomenclature of Degree Program running in College of COVAS.

माननीय विद्वत परिषद द्वारा उक्त प्रस्ताव पर चर्चा की गयी तथा BSMA (Restructured and Revised Syllabi of PG Programme) के दृष्टिगत निम्न विभागों के नामकरण का परिवर्तन किये जाने पर सहमति व्यक्त की गयी।

क्र०सं०	पूर्व विभाग का नाम	अनुमोदित विभाग का नाम
1	Anatomy	Veterinary Anatomy
2	Gynaecology	Animal Reproduction Gynaecology & Obstetrics
3	Extension	Veterinary Extension Education

कार्यवाही: सम्बन्धित विभागाध्यक्ष/अधिष्ठाता/कुलसचिव

संकल्प सं०-10

Agenda for Implementation of BSMA (Restructured and Revised Syllabi of PG Programme)

माननीय विद्वत परिषद द्वारा उक्त प्रस्ताव पर चर्चा की गयी तथा सत्र 2023-24 से BSMA (Restructured and Revised Syllabi of PG Programme) को लागू किये जाने का अनुमोदन किया गया। अधिष्ठाता स्नातकोत्तर सभी महाविद्यालय के मास्टर्स एवं पीएचडी पाठ्यक्रमों की एक संयुक्त पाठ्यक्रम की पुस्तिका तैयार कर आगामी बैठक में चर्चा हेतु प्रेषित करेंगे। जिससे कि किसी भी विभाग के डिग्री प्रोग्राम का कोर्स कन्टेंट या सिलेबस से सम्बन्धित विवरण छूट न जाय।

कार्यवाही: अधिष्ठाता स्नातकोत्तर/सम्बन्धित विभागाध्यक्ष

संकल्प सं०-11

स्नातक कृषि उद्योगों के पाठ्यक्रम में रोजगार परत (Employability) मूल्य संवर्धक (Value added) एवं स्थानीय, क्षेत्रीय आवश्यकतानुसार संशोधन करने के सम्बन्ध में।

माननीय विद्वत परिषद द्वारा उक्त प्रस्ताव पर चर्चा की गयी तथा अनुमोदन किया गया।

कार्यवाही: अधिष्ठाता कृषि महाविद्यालय

संकल्प सं०-12

स्नातक कृषि अभियांत्रिक पाठ्यक्रम के सिलेबस में वर्तमान परिप्रेक्ष्य के अनुरूप आंशिक संशोधन किये जाने के सम्बन्ध में प्रस्ताव।

माननीय विद्वत परिषद द्वारा उक्त प्रस्ताव पर चर्चा की गयी तथा अनुमोदन किया गया।

कार्यवाही: अधिष्ठाता तकनीकी महाविद्यालय



syllabus for all the disciplines:

	Masters' Programme	Doctoral Programme
(i) Course work		
Major courses	20	12
Minor courses	08	06
Supporting courses	06	05
Common courses	05	—
Seminar	01	02
(ii) Thesis Research	30	75
Total	70	100

Major courses: From the Discipline in which a student takes admission. Among the listed courses, the core courses compulsorily to be taken may be given *mark

Minor courses: From the subjects closely related to a student's major subject

Supporting courses: The subject not related to the major subject. It could be any subject considered relevant for student's research work (such as Statistical Methods, Design of Experiments, etc.) or necessary for building his/ her overall competence.

Common Courses: The following courses (one credit each) will be offered to all students undergoing Master's degree programme:

1. Library and Information Services
2. Technical Writing and Communications Skills
3. Intellectual Property and its management in Agriculture
4. Basic Concepts in Laboratory Techniques
5. Agricultural Research, Research Ethics and Rural Development Programmes

Some of these courses are already in the form of e-courses/ MOOCs. The students may be allowed to register these courses/ similar courses on these aspects, if available online on SWAYAM or any other platform. If a student has already completed any of these courses during UG, he/ she may be permitted to register for other related courses with the prior approval of the Head of Department (HoD)/ Board of Studies (BoS).

2.2 Supporting Courses

The following courses are being offered by various disciplines (The list is only indicative). Based on the requirement, any of the following courses may be opted under the supporting courses. The syllabi of these courses are available in the respective disciplines. If required, the contents may be modified to suit the individual discipline with approval of the concerned BoS:

Code	Course Title	Credit Hours
STAT 501	Mathematics for Applied Sciences	2+0
STAT 502	Statistical Methods for Applied Sciences	3+1



Course Code	Course Title	Credit Hours
STAT 511	Experimental Designs	2+1
STAT 512	Basic Sampling Techniques	2+1
STAT 521	Applied Regression Analysis	2+1
STAT 522	Data Analysis Using Statistical Packages	2+1
MCA 501	Computers Fundamentals and Programming	2+1
MCA 502	Computer Organization and Architecture	2+0
MCA 511	Introduction to Communication Technologies, Computer Networking and Internet	1+1
MCA 512	Information Technology in Agriculture	1+1
BIOCHEM 501	Basic Biochemistry	3+1
BIOCHEM 505	Techniques in Biochemistry	2+2

2.3 Syllabus of Common Courses for PG programmes

LIBRARY AND INFORMATION SERVICES (0+1)

Objective

To equip the library users with skills to trace information from libraries efficiently, to apprise them of information and knowledge resources, to carry out literature survey, to formulate information search strategies, and to use modern tools (Internet, OPAC, search engines, etc.) of information search.

Practical

Introduction to library and its services; Role of libraries in education, research and technology transfer; Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.); Tracing information from reference sources; Literature survey; Citation techniques/ Preparation of bibliography; Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engines and its resources; e-resources access methods.

TECHNICAL WRITING AND COMMUNICATIONS SKILLS (0+1)

Objective

To equip the students/ scholars with skills to write dissertations, research papers, etc. To equip the students/ scholars with skills to communicate and articulate in English (verbal as well as writing).

Practical (Technical Writing)

- Various forms of scientific writings- theses, technical papers, reviews, manuals, etc.;
- Various parts of thesis and research communications (title page, authorship contents page, preface, introduction, review of literature, material and methods, experimental results and discussion);
- Writing of abstracts, summaries, précis, citations, etc.;

PROPOSED COURSE CURRICULA FOR ADDITION/DELETION

Department of Agronomy: College of Agriculture

Course contents

Name of Programme: B.Sc. (Ag.) Agronomy

Fundamentals of Agronomy 4(3+1)

Theory

Agronomy and its scope, seeds and sowing, tillage and tilth, crop density and geometry, Crop nutrition, manures and fertilizers, nutrient use efficiency, water resources, soil-plant-water relationship, crop water requirement, water use efficiency, irrigation-scheduling criteria and methods, quality of irrigation water, water logging.

Weeds- importance, classification, crop-weed competition, concepts of weed management- principles and methods, herbicides- classification, selectivity and resistance, allelopathy.

Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, crop management technologies in problematic areas, harvesting and threshing of crops.

Practical

Identification of crops, seeds, fertilizers, pesticides and tillage implements, study of agro- climatic zones of India, Identification of weeds in crops, Methods of herbicide and fertilizer application, Study of yield contributing characters and yield estimation, Seed germination and viability test, Numerical exercises on fertilizer requirement, plant population, herbicides and water requirement, Use of tillage implements-reversible plough, one way plough, harrow, leveler, seed drill, Study of soil moisture measuring devices, Measurement of field capacity, bulk density and infiltration rate, Measurement of irrigation water.

Addition: in theory

- Important National agricultural institutes
- Agronomical Biofortification in field crops

Addition: in practical

- Numerical exercises on seed rate and moisture estimation in soil

Theory

Meaning and scope of agricultural meteorology; Earth atmosphere- its composition, extent and structure; Atmospheric weather variables; Atmospheric pressure, its variation with height; Wind, types of wind, daily and seasonal variation of wind speed, cyclone, anticyclone, land breeze and sea breeze; Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave, longwave and thermal radiation, net radiation, albedo; Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, Energy balance of earth; Atmospheric humidity, concept of saturation, vapor pressure, process of condensation, formation of dew, fog, mist, frost, cloud; Precipitation, process of precipitation, types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification; Artificial rainmaking. Monsoon- mechanism and importance in Indian agriculture, Weather hazards - drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold-wave. Agriculture and weather relations; Modifications of crop microclimate, climatic normals for crop and livestock production. Weather forecasting- types of weather forecast and their uses. Climate change, climatic variability, global warming, causes of climate change and its impact on regional and national Agriculture.

Practical

Visit of Agrometeorological Observatory, site selection of observatory, exposure of instruments and weather data recording. Measurement of total, shortwave and longwave radiation, and its estimation using Planck's intensity law. Measurement of albedo and sunshine duration, computation of Radiation Intensity using BSS. Measurement of maximum and minimum air temperatures, its tabulation, trend and variation analysis. Measurement of soil temperature and computation of soil heat flux. Determination of vapor pressure and relative humidity. Determination of dew point temperature. Measurement of atmospheric pressure and analysis of atmospheric conditions. Measurement of wind speed and wind direction, preparation of wind rose. Measurement, tabulation and analysis of rain. Measurement of open pan evaporation and evapotranspiration. Computation of PET and AET.

Addition: in theory

- Climate smart agriculture

Theory

Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of *Kharif* crops. Cereals – rice, maize, sorghum, pearl millet and finger millet, pulses-pigeonpea, mungbean and urdbean; oilseeds- groundnut, and soybean; fibre crops- cotton & jute; forage crops-sorghum, cowpea, cluster bean and napier.

Practical

Rice nursery preparation, transplanting of rice, sowing of soybean, pigeonpea and mungbean. maize, groundnut and cotton, effect of seed size on germination and seedling vigour of *kharif* season crops, effect of sowing depth on germination of *kharif* crops, identification of weeds in *kharif* season crops, top dressing and foliar feeding of nutrients, study of yield contributing characters and yield calculation of *kharif* season crops, study of crop varieties and important agronomic experiments at experimental farm. Study of forage experiments, morphological description of *kharif* season crops, visit to research centres of related crops.

Addition: in theory

- Value addition in important kharif crops

Crop Production Technology-II (*Rabi* crops)

3(2+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-rape seed, 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.

Addition: in theory

- Value addition in rabi crops

Addition: in practical

- Yield estimation in important rabi season crops

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.

Addition: in theory

- Natural and organic farming systems

Practical Crop Production-I (*Kharif Crops*)

2(0+2)

Practical

Crop planning, raising field crops in multiple cropping systems: Field preparation, seed, treatment, nursery raising, sowing, nutrient, water and weed management and management of insect-pests diseases of crops, harvesting, threshing, drying winnowing, storage and marketing of produce. The emphasis will be given to seed production, mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.

Addition: in practical

- Post harvest management and value addition in major kharif crops.

Practical Crop Production-II (*Rabi Crops*)

2(0+2)

Practical

Crop planning, raising field crops in multiple cropping systems: Field preparation, seed, treatment, nursery raising, sowing, nutrient, water and weed management and management of insect-pests diseases of crops, harvesting, threshing, drying winnowing, storage and marketing of produce. The emphasis will be given to seed production, mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.

Addition: in practical

- Post harvest management and value addition in major rabi crops

Principles of Organic Farming

2(1+1)

Theory

Organic farming, principles and its scope in India; Initiatives taken by Government (central/ state), NGOs and other organizations for promotion of organic agriculture: Organic ecosystem and their concepts; Organic nutrient resources and its fortification: Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming; Fundamentals of insect, pest, disease and weed management under organic mode of production; Operational structure of NPOP; Certification process and standards of organic farming; Processing, leveling, economic considerations and viability, marketing and export potential of organic products.

Practical

Visit of organic farms to study the various components and their utilization; Preparation of enriched compost, vermicompost, bio-fertilizers/bio-inoculants and their quality analysis; Indigenous technology knowledge (ITK) for nutrient, insect, pest disease and weed management; Cost of organic production system; Post harvest management; Quality aspect, grading, packaging and handling.

Addition: in theory

- Natural farming: its concepts, principles and scope in Indian context

Addition: in practical

- Visit of natural farming unit/site
- Study of Beejamrit, Jeevamrit, Ghanjeevmarit and Vanafsa

Geoinformatics, Nano-technology and Precision Farming 2(1+1)

Theory

Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture; Geo-informatics- definition, concepts, tool and techniques; their use in Precision Agriculture. Crop discrimination and Yield monitoring, soil mapping; fertilizer recommendation using geospatial technologies; Spatial data and their management in GIS; Remote sensing concepts and application in agriculture; Image processing and interpretation; Global positioning system (GPS), components and its functions; Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach for precision agriculture; Nanotechnology, definition, concepts and techniques, brief introduction about nanoscale effects, nano-particles, nano-pesticides, nano-fertilizers, nano-sensors, Use of nanotechnology in seed, water, fertilizer, plant protection for scaling-up farm productivity.

Practical

Introduction to GIS software, spatial data creation and editing. Introduction to image processing software. Visual and digital interpretation of remote sensing images. Generation of spectral profiles of different objects. Supervised and unsupervised classification and acreage estimation. Multispectral remote sensing for soil mapping. Creation of thematic layers of soil fertility based on GIS. Creation of productivity and management zones. Fertilizers recommendations based of VRT and STCR techniques. Crop stress (biotic/abiotic) monitoring using geospatial technology. Use of GPS for agricultural survey. Formulation, characterization and applications of nano particles in agriculture. Projects formulation and execution related to precision farming.

Addition: in theory

- Use of drones in agriculture for survey and precision input management

Addition: in practical

- Study of drone and its application in agriculture

Rainfed Agriculture and Watershed Management – (New) 2(1+1)

Theory

Rainfed agriculture: Introduction, types, History of rainfed agriculture and watershed in India; Problems and prospects of rainfed agriculture in India; Soil and climatic conditions prevalent in rainfed areas; Soil and water conservation techniques, Drought: types, effect of water deficit on physio-morphological characteristics of the plants, Crop adaptation and mitigation to drought; Water harvesting: importance, its techniques, Efficient utilization of water through soil and crop management practices, Management of crops in rainfed areas, Contingent crop planning for aberrant weather conditions, Concept, objective, principles and components of watershed management, factors affecting watershed management.

Practical

Studies on climate classification, studies on rainfall pattern in rainfed areas of the country and pattern of onset and withdrawal of monsoons. Studies on cropping pattern of different rainfed areas in the country and demarcation of rainfed area on map of India. Interpretation of meteorological data and scheduling of supplemental irrigation on the basis of evapo-transpiration demand of crops. Critical analysis of rainfall and possible drought period in the country, effective rainfall and its calculation. Studies on cultural practices for mitigating moisture stress. Characterization and delineation of model watershed. Field demonstration on soil & moisture conservation measures. Field demonstration on construction of water harvesting structures. Visit to rainfed research station/watershed.

Addition: in theory

- Importance of natural farming practices in relation to rainfed agriculture

Addition: in practical

- Studies on natural, organic and chemical farming in rainfed conditions

सस्य विज्ञान विभाग: कृषि महाविद्यालय

पत्रांक: सवप/एजी/एग्रो/2022/0875
दिनांक: 02.09.2022

अधिष्ठाता स्नातकोत्तर

कृपया सह-अधिष्ठाता स्नातकोत्तर के पत्रांक सवप/पी0जी0एस0/2325/2022, दिनांक 03.06.2022 का संदर्भ ग्रहण करना चाहे जिसमें उनके द्वारा दिये गये IIFSR, मोदीपुरम के वैज्ञानिकों के की सूची पूर्व में भेजी गयी थी किन्तु किसी कारणवश निम्नलिखित वैज्ञानिकों का नाम सूची में छूट गया था। जिनका नाम निम्न प्रकार है।

S. No.	Name of Scientist	Designation	Subject	Specialization
1.	Dr. Mohammad Shamim	Senior Scientist	Agricultural Meteorology	Agrometeorological Crop growth Evaluation. Crop simulation modeling (DSSAT and APSIM)
2.	Dr. Nirmal	Scientist	Forestry	Agroforestry

अतः आपसे निवेदन है कि उपरोक्त वैज्ञानिकों का नाम शामिल करने का कष्ट करें ताकि उपरोक्त वैज्ञानिकों का सस्य विज्ञान विभाग में शिक्षण/शोध कार्यों में सहयोग लिया जायेगा।

आवश्यक कार्यवाही हेतु प्रेषित।

Vinay
2.9.22
(विभागाध्यक्ष)

प्रतिलिपि:

- कुलसचिव को इस आशय के साथ सूचनार्थ प्रेषित की संकल्प संख्या 07 में उपरोक्त नाम शामिल करने का कष्ट करें

03/9
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03/9

Restructured and Revised Syllabi of Post-graduate Programmes

Agronomy

Course Title with Credit Load

M.Sc. Ag. in Agronomy

Course Code	Course Title	Credit Hours
Agron 501*	Modern Concepts in Crop Production	3+0
Agron 502*	Principles and practices of soil fertility and nutrient management	2+1
Agron 503*	Principles and Practices of Weed Management	2+1
Agron 504*	Principles and Practices of Water Management	2+1
Agron 505	Conservation Agriculture	1+1
Agron 506	Agronomy of major Cereals and Pulses	2+0
Agron 507	Agronomy of oilseed, fibre and sugar crops	2+1
Agron 508	Agronomy of medicinal, aromatic & underutilized crops	2+1
Agron 509	Agronomy of fodder and forage crops	2+1
Agron 510	Agrostology and Agro- Forestry	2+1
Agron 511	Cropping System and Sustainable Agriculture	2+0
Agron 512	Dryland Farming and Watershed Management	2+1
Agron 513	Principles and practices of organic farming	2+1
Agron-550	Master's Seminar	(1+0)
Agron -560	Master's research	-30

*Indicates core course which is Compulsory course for M Sc.(Ag.)

Revised Course Contents M.Sc. in Agronomy

Course Title: Modern Concepts in Crop Production

Course Code: Agron 501

Credit Hours: 3+0

Aim of the course

To teach the basic concepts of soil management and crop production.

I. Theory

Unit I

Crop growth analysis in relation to environment; geo-ecological zones of India.

Unit II

Quantitative agro-biological principles and inverse yield nitrogen law; Mitscherlich yield equation, its interpretation and applicability; Baule unit.

Unit III

Effect of lodging in cereals; physiology of grain yield in cereals; optimization of plant population and planting geometry in relation to different resources, concept of ideal plant type and crop modeling for desired crop yield.

Unit IV

Scientific principles of crop production; crop response production functions; concept of soil plant relations; yield and environmental stress, use of growth hormones and regulators for better adaptation in stressed condition.

Unit V

Integrated farming systems, organic farming and resource conservation technology including modern concept of tillage; dry farming; determining the nutrient needs for yield potentiality of crop plants, concept of balance nutrition and integrated nutrient management; precision agriculture. Modern crop production concepts: soil less cultivation, Aeroponic, Hydroponic, Robotic and terrace farming. Use of GIS, GPS and remote sensing in modern agriculture, precision farming and protected agriculture.

II. Teaching methods/activities

Classroom teaching with AV aids, group discussion, assignment and class discussion

ADDITION

- Use of drones for Precision input management in modern Agriculture.
- Concept and principles of Natural Farming.

Course Title : Principles and Practices of Soil Fertility and Nutrient Management

Course Code : Agron 502

Credit Hours : 2+1

Aim of the course

To impart knowledge of fertilizers and manures as sources of plant nutrients and apprise about the integrated approach of plant nutrition and sustainability of soil fertility.

I. Theory

Unit I

Soil fertility and productivity - factors affecting; features of good soil management; problems of supply and availability of nutrients; relation between nutrient supply and crop growth; organic farming - basic concepts and definitions.

Unit II

Criteria of essentiality of nutrients; Essential plant nutrients – their functions, nutrient deficiency symptoms; transformation and dynamics of major plant nutrients.

Unit III

Preparation and use of farmyard manure, compost, green manures, vermicompost, biofertilizers and other organic concentrates their composition, availability and crop responses; recycling of organic wastes and residue management. Soil less cultivation.

Unit IV

Commercial fertilizers; composition, relative fertilizer value and cost; crop response to different nutrients, residual effects and fertilizer use efficiency; agronomic, chemical and physiological, fertilizer mixtures and grades; methods of increasing fertilizer use efficiency; nutrient interactions.

Unit V

Time and methods of manures and fertilizers application; foliar application and its concept; relative performance of organic and inorganic nutrients; economics of fertilizer use; integrated nutrient management; use of vermincompost and residue wastes in crops.

II. Practical

- Determination of soil pH and soil EC
- Determination of soil organic C
- Determination of available N, P, K and S of soil
- Determination of total N, P, K and S of soil
- Determination of total N, P, K, S in plant
- Computation of optimum and economic yield

III. Teaching methods/activities

Classroom teaching with AV aids, group discussion, assignment and class discussion

ADDITION

Theory

- Use and importance of Nano fertilizers in crop production.

Practical

- Field visit related to fertility experiments

Course Title: Principles and Practices of Weed Management

Course Code: Agron 503

Credit Hours: 2+1

Aim of the course

To familiarize the students about the weeds, herbicides and methods of weed control.

I. Theory

Unit I

Weed biology, and ecology and classification, crop-weed competition including allelopathy; principles and methods of weed control and classification management; weed indices, weed shift in different eco-systems.

Unit II

Herbicides introduction and history of their development; classification based on chemical, physiological application and selectivity; mode and mechanism of action of herbicides.

Unit III

Herbicide structure-activity relationship; factors affecting the efficiency of herbicides; herbicide formulations, herbicide mixtures, sequential application of herbicides, rotation; weed control through use of nano-herbicides and bio-herbicides, myco-herbicides bio-agents, and allelochemicals; movement of herbicides in soil and plant, Degradation of herbicides in soil and plants; herbicide resistance, residue, persistence and management; development of herbicide resistance in weeds and crops and their management, herbicide combination and rotation.

Unit IV

Weed management in major crops and cropping systems; alien, invasive and parasitic weeds and their management; weed shifts in cropping systems; aquatic and perennial weed control; weed control in non-crop area.

Unit V

Integrated weed management; recent development in weed management-robotics, use of drones and aeroplanes, organic etc., cost: benefit analysis of weed management.

II. Practical

- Identification of important weeds of different crops, Preparation of a weed herbarium, Weed survey in crops and cropping systems, Crop-weed competition studies, Weed indices calculation and interpretation with data, Preparation of spray solutions of herbicides for high and low-volume sprayers, Use of various types of spray pumps and nozzles and calculation of swath width, Economics of weed control, Herbicide resistance analysis in plant and soil,
- Bioassay of herbicide resistance residues,
- Calculation of herbicidal herbicide requirement

ADDITION

Theory

- **Impact of RCT on weed and its management.**

Practical

- **Visit to the nearby research institutions Farmers field.**

Course Title : Principles and Practices of Water Management

Course Code : Agron 504

Credit Hours : 2+1

Aim of the course

To teach the principles of water management and practices to enhance the water productivity

I. Theory

Unit I

Water and its role in plants; Irrigation: Definition and objectives, water resources and irrigation development in of India and concerned state, major irrigation projects, extent of area and crops irrigated in India and in different states.

Unit II

Field water cycle, water movement in soil and plants; transpiration; soil-water- plant relationships; water absorption by plants; plant response to water stress, crop plant adaptation to moisture stress condition. Water availability and its relationship with nutrient availability and losses.

Unit III

Soil, plant and meteorological factors determining water needs of crops. scheduling, depth and methods of irrigation; micro irrigation systems; deficit irrigation; fertigation; management of water in controlled environments and polyhouses. Irrigation efficiency and water use efficiency.

Unit IV

Water management of crop and cropping system, Quality of irrigation water and management of saline water for irrigation, Crop water requirement- estimation of ET and effective rainfall; Water management of the major crops and cropping systems. Automated irrigation system.

Unit V

Excess of soil water and plant growth; drainage requirement of crops and methods of field drainage, their layout and spacing;

Unit VI

Quality of irrigation water and management of saline water for

irrigation, water management in problem soils.

Unit VII

Soil moisture conservation, water harvesting, rain water management and its utilization for crop production.

Unit VIII

Hydroponics,

Unit IX

Water management of crops under climate change scenario.

II. Practical

- Determination of Field capacity by field method
- Determination of Permanent Wilting Point by sunflower pot culture technique
- Determination of Field capacity and Permanent Wilting Point by Pressure Plate Apparatus
- Determination of Hygroscopic Coefficient
- Determination of maximum water holding capacity of soil
- Measurement of matric potential using gauge and mercury type tensiometer
- Determination of soil-moisture characteristics curves
- Determination of saturated hydraulic conductivity by constant and falling head method
- Determination of hydraulic conductivity of saturated soil below the water table by auger hole method
- Measurement of soil water diffusivity
- Estimation of unsaturated hydraulic conductivity
- Estimation of upward flux of water using tensiometer and from depth ground water table
- Determination of irrigation requirement of crops (calculations)
- Determination of effective rainfall (calculations)
- Determination of ET of crops by soil moisture depletion method
- Determination of water requirements of crops
- Measurement of irrigation water by volume and velocity-area method
- Measurement of irrigation water by measuring devices and calculation of irrigation efficiency
- Determination of infiltration rate by double ring infiltrometer

ADDITION

Theory

- Precision water management

Practical

- Study of various irrigation methods adopted in field crops

DELETION

Practical

- Determination of saturated hydraulic conductivity by constant and falling head method
- Determination of hydraulic conductivity of saturated soil below the water table by auger hole method
- Measurement of soil water diffusivity
- Estimation of unsaturated hydraulic conductivity
- Estimation of upward flux of water using tensiometer and from depth ground water table

Course Title : Conservation Agriculture

Course Code : Agron 505

Credit Hours : 1+1

Aim of the course

To impart knowledge of conservation of agriculture for economic development.

I. Theory

Unit I

Conventional and conservation agriculture systems, sustainability concerns, conservation agriculture: Historical background and present concept, global experiences, present status in India.

Unit II

Nutrient management in CA, water management, weed management, energy use, insect-pest and disease management, farm machinery, crop residue management, cover crop management.

Unit III

Climate change mitigation and CA, C-sequestration, soil health management, soil microbes and CA.

Unit IV

CA in agroforestry systems, rainfed/dryland regions

Unit V

Economic considerations in CA, adoption and constraints, CA: The future of agriculture

II. Practical

- Study of long-term experiments on CA.
- Evaluation of soil health parameters,
- Estimation of C-sequestration,
- Machinery calibration for sowing different crops, weed seedbank estimation under CA, energy requirements, economic analysis of CA.

III. Teaching methods/activities

Classroom teaching with AV aids, group discussion, oral presentation by students.

ADDITION

Theory

- Resource generation through Conservation Agriculture

Practical

- Study of weed shift in major cropping systems under Conservation Agriculture
- Visit of field experiments on fertilizer, weed control and water management aspects

Course Title: Agronomy of Major Cereals and Pulses

Course Code: Agron 506

Credit Hours: 2+1

Aim of the course

To impart knowledge of crop husbandry of cereals and pulse crops.

I. Theory

Origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality components, handling and processing of the produce for maximum production of:

Unit I Rabi cereals.

Unit II Kharif cereals.

Unit III Rabi pulses.

Unit IV Kharif pulses.

II. Practical

- Phenological studies at different growth stages of crop
- Estimation of crop yield on the basis of yield attributes
- Formulation of cropping schemes for various farm sizes and calculation of cropping and rotational intensities
- Working out growth indices (CGR, RGR, NAR, LAI, LAD, LAR, LWR, SLA, SLW etc)
- Assessment of land use and yield advantage (Rotational intensity, Cropping intensity, Diversity Index, Sustainable Yield Index Crop Equivalent Yield, Land Equivalent ratio, Aggressiveness, Relative Crowding Coefficient, Competition Ratio and ATER etc)
- Estimation of protein content in pulses
- Planning and layout of field experiments
- Judging of physiological maturity in different crops
- Intercultural operations in different crops
- Determination of cost of cultivation of different crops
- Working out harvest index of various crops
- Study of seed production techniques in selected crops
- Visit of field experiments on cultural, fertilizer, weed control and water management aspects

- Visit to nearby villages for identification of constraints in crop production

ADDITION

Theory

- Economic importance of cereals and pulses
- Value addition and post harvest management in major crops

Practical

- Field visit related to important fodder/forage crops

Course Title : Agronomy of Oilseed, Fiber and Sugar Crops

Course Code : Agron 507

Credit Hours : 2+1

Aim of the course

To teach the crop husbandry of oilseed, fiber and sugar crops

I. Theory

Origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality component, handling and processing of the produce for maximum production of:

Unit I

Rabi oilseeds – Rapeseed and mustard, Linseed and Niger

Unit II

Kharif oilseeds - Groundnut, Sesame, Castor, Sunflower, Soybean and Safflower

Unit III

Fiber crops - Cotton, Jute, Ramie and Mesta.

Unit IV

Sugar crops – Sugar-beet and Sugarcane.

II. Practical

- Planning and layout of field experiments
- Cutting of sugarcane setts, its treatment and methods of sowing, tying and propping of sugarcane
- Determination of cane maturity and calculation on purity percentage, recovery percentage and sucrose content in cane juice phenological studies at different growth stages of crop
- Intercultural operations in different crops
- Cotton seed treatment
- Working out growth indices (CGR, RGR, NAR, LAI, LAD, LAR, LWR, SLA, SLW etc)
- Assessment of land use and yield advantage (Rotational intensity, Cropping intensity, Diversity Index, Sustainable Yield Index Crop Equivalent Yield, Land Equivalent ration, Aggressiveness, Relative Crowding Coefficient, Competition Ratio and ATER etc)

- Judging of physiological maturity in different crops and working out harvest index
- Working out cost of cultivation of different crops
- Estimation of crop yield on the basis of yield attributes
- Formulation of cropping schemes for various farm sizes and calculation of cropping and rotational intensities
- Determination of oil content in oilseeds and computation of oil yield
- Estimation of quality of fibre of different fibre crops
- Study of seed production techniques in various crops
- Visit of field experiments on cultural, fertilizer, weed control and water management aspects
- Visit to nearby villages for identification of constraints in crop production

ADDITION

Theory

- Economic importance of oilseed, fibre and sugar crops
- Value addition and post harvest management in major crops

Practical

- Field visit related to important fodder/forage crops

Course Title : Agronomy of Fodder and Forage Crops

Course Code : Agron 509

Credit Hours : 2+1

Aim of the course

To teach the crop husbandry of different forage and fodder crops along with their processing.

I. Theory

Unit I

Adaptation, distribution, varietal improvement, agro-techniques and quality aspects including anti-quality factors of important fodder crops like sorghum, maize, *bajra*, *guar*, cowpea, oats, barley, berseem, *senji*, lucerne, etc.

Unit II

Adaptation, distribution, varietal improvement, agro-techniques and quality aspects including anti-quality factors of important forage crops/grasses line, Napier grass, *Panicum*, *Lasiurus*, *Cenchrus*, etc.

Unit III

Year-round fodder production and management, preservation and utilization of forage and pasture crops.

Unit IV

Principles and methods of hay and silage making; chemical and biochemical changes, nutrient losses and factors affecting quality of hay and silage; use of physical and chemical enrichments and biological methods for improving nutrition; value addition of poor quality fodder. Fodder production through hydroponics, *Azolla* cultivation.

Unit V

Economics of forage cultivation uses and seed production techniques of important fodder crops.

II. Practical

- Practical training of farm operations in raising fodder crops;
- Canopy measurement, yield, Leaf: Stem ratio and quality estimation, viz. crude protein, NDF, ADF, lignin, silica, cellulose and IVDMD, etc. of various fodder and forage crops

- Anti-quality components like HCN in sorghum and such factors in other crops
- Hay and silage making and economics of their preparation.

ADDITION

Theory

- Economic importance of cereals and pulses
- Value addition and post harvest management in major crops

Practical

- Field visit related to important fodder/forage crops

Course Title : Cropping Systems and Sustainable Agriculture

Course Code : Agron 511

Credit Hours : 2+0

Aim of the course

To acquaint the students about prevailing cropping systems in the country and practices to improve their productivity.

I. Theory

Unit I

Cropping systems: definition, indices and its importance; physical resources, soil and water management in cropping systems; assessment of land use.

Unit II

Concept of sustainability in cropping systems and farming systems, scope and objectives; production potential under monoculture/ cropping, multiple cropping, alley cropping, sequential cropping and intercropping, mechanism of yield advantage in intercropping systems.

Unit III

Above and below ground interactions and allelopathic effects; competition relations; multi-storied cropping and yield stability in intercropping, role of non-monetary inputs

Unit IV

Crop diversification for sustainability; role of organic matter in maintenance of soil fertility; crop residue management; fertilizer use efficiency and concept of fertilizer use in intensive cropping system. Advanced nutritional tools for big data analysis and interpretation.

Unit V

Plant ideotypes for drylands; plant growth regulators and their role in sustainability.

Unit VI

Artificial Intelligence- Concept and application.

ADDITION

- Ill effects of present day modern Agriculture
- Resource use on long term sustainability basis

Course Title : Principles and Practices of Organic Farming

Course Code : Agron 513

Credit Hours : 2+1

Aim of the course

To study the principles and practices of organic farming for sustainable crop production.

I. Theory

Unit I

Organic farming - concept and definition, its relevance to India and global agriculture and future prospects; principles of organic agriculture; organics and farming standards; organic farming and sustainable agriculture; selection and conversion of land, soil and water management - land use, conservation tillage; shelter zones, hedges, pasture management, agro-forestry.

Unit II

Organic farming and water use efficiency; soil fertility, nutrient recycling, organic residues, organic manures, composting, soil biota and decomposition of organic residues, earthworms and vermicompost, green manures, bio-fertilizers and biogas technology.

Unit III

Farming systems, selection of crops and crop rotations, multiple and relay cropping systems, intercropping in relation to maintenance of soil productivity.

Unit IV

Control of weeds, diseases and insect pest management, biological agents and pheromones, bio-pesticides.

Unit V

Socio-economic impacts; marketing and export potential: inspection, certification, labeling and accreditation procedures; organic farming and national economy.

II. Practical

- Method of making compost by aerobic method
- Method of making compost by anaerobic method
- Method of making vermicompost

- Identification and nursery raising of important agro-forestry trees and tree shelter belts
- Efficient use of biofertilizers, technique of treating legume seeds with *Rhizobium* cultures, use of *Azotobacter*, *Azospirillum*, and PSB cultures in field
- Visit to a biogas plant
- Visit to an organic farm
- Quality standards, inspection, certification and labeling and accreditation procedures for farm produce from organic farms

ADDITION

Theory

- Natural farming: concept, definition, principles, advantages and limitation, different preparation for nutrient and pest management, importance in Indian context, economic consideration and viability
- Post harvest management and value addition in organic and natural produce

Practical

- Visit on the farmer's field and institutions related to natural farming
- Preparation of Beejamrit, Jeevamrit, Ghanjeevamrit and Vanapsa etc. and its uses

Course Title with Credit Load

Ph.D. in Agronomy

Course Code	Course Title	Credit Hours
Agron 601*	Current trends in Agronomy	3+0
Agron 602	Recent trends in crop growth and productivity	2+1
Agron 603	Irrigation management	2+1
Agron 604	Recent trends in weed management	2+0
Agron 605	Integrated farming systems for sustainable Agriculture	2+0
Agron 606	Soil Conservation and Watershed Management	2+1
Agron 607	Stress Crop Production	2+1
Agron 608*	Research and Publication ethics	2+0
Agron-691	Doctoral Seminar	1+0
Agron 692	Doctoral Seminar	1+0
Agron 699	Doctoral Research	75

*Indicates Core course for Ph.D.

Course Contents

Ph.D. in Agronomy

Course Title : Current Trends in Agronomy

Course Code: Agron 601

Credit Hours : 3+0

Aim of the course

To acquaint the students about recent advances in agricultural production.

I. Theory

Unit I

Agro-physiological basis of variation in yield, recent advances in soilplant-water relationship.

Unit II

Globalization of agriculture and WTO, precision agriculture, contract farming, organic farming, marketing and export potential of organic products, certification, labeling and accreditation procedures and ITK in organic farming.

Unit III

Crop residue management in multiple cropping systems; latest developments in plant management Mechanization in crop production: modern agricultural precision tools and technologies, weed management, cropping systems, grassland management, agro-forestry, allelopathy.

Unit IV

GIS, GPS and remote sensing for crop management, global warming, GM crops, seed production technology; seed certification, seed multiplication, hybrid seedproduction etc.

Unit V

Concepts of system agriculture: holistic approach of farming systems, dryland farming, sustainable agriculture and research methodology in Agronomy. Conservation agriculture, principles, prospects and importance, potential benefits of CA under climate change scenario, policy issues.

ADDITION

Theory

- Resource generation through crop residue management
- Agronomic bio-fortification in major crops

Course Title : Recent Trends in Crop Growth and Productivity

Course Code : Agron 602

Credit Hours : 2+1

Aim of the course

To study the physiology of vegetative and reproductive growth in relation to productivity of different crops in various environments.

I. Theory

Unit I

Plant density and crop productivity; plant and environmental factors; yield, plant distribution, strategies for maximizing solar energy utilization; leaf area; interception of solar radiation and crop growth; photosynthesis: the photosynthetic apparatus, factors essential for photosynthesis; difference in photosynthetic rates among and within species; physiological limitations to crop yield; solar radiation concept and agro-techniques for harvesting solar radiation.

Unit II

Growth analysis: concept, CGR, RGR, NAR, LAI, LAD, LAR; validity and Limitations in interpreting crop growth and development; growth curves: sigmoid, polynomial and asymptotic; root systems; root-shoot relationship; principles involved in inter and mixed cropping systems under rainfed and irrigated conditions; concept and differentiation of inter and mixed cropping; criteria in assessing the yield advantages.

Unit III

Competitive relationship and competition functions; biological and agronomic basis of yield advantage under intercropping; physiological principles of dry land crop production, constraints and remedial measures; heat unit concept of crop maturity: concept and types of heat units.

Unit IV

Concept of plant ideotypes: crop physiological and new ideotypes; characteristics of ideotype for wheat, rice, maize, etc.; concept and types of growth hormones; their role in field crop production; efficient use of resources.

II. Practical

- Field measurement of root-shoot relationship in crops at different growth stages
- Estimation of growth evaluating parameters like CGR, RGR, NAR, LAI etc., at

different stages of crop growth

- Computation of harvest index of various crops
- Assessment of crop yield on the basis of yield attributing characters
- Construction of crop growth curves based on growth analysis data
- Computation of competition functions, viz. LER, IER aggressivity competition index etc in intercropping
- Senescence and abscission indices
- Analysis of productivity trend in un-irrigated areas
- Analysis of productivity trend in irrigated areas

ADDITION

Theory

- Concept of plant ideotypes: crop physiological and new characteristics of ideotype for Sugarcane
- Concept of growing degree days

Course Title : Irrigation Management

Course Code : Agron 603

Credit Hours : 2+1

Aim of the course

To teach students about optimization of irrigation in different crops under variable agro climatic conditions.

I. Theory

Unit I

Global water resources; Water resources of India, irrigation projects during pre and post independence period and their significance in crop production; irrigation needs, atmospheric, soil, agronomic, plant and water factors affecting irrigation need; water deficits and crop growth.

Unit II

Movement of water in soil-water movement under saturated and unsaturated conditions, Poiseuille's and Darcy's law, general equation of saturated and unsaturated flow of water in soil.

Soil-plant-water relationships, evaporation, transpiration and evapotranspiration, significance of transpiration, energy utilization in transpiration, physiological processes and crop productivity.

Unit III

Water requirement, irrigation needs, factors affecting irrigation need; water use efficiency, Infiltration; water movement under saturated and unsaturated conditions; management practices for improving water use efficiency of crops.

Unit IV

Soil and plant water potential, SPAC, transpiration and evapotranspiration, significance of transpiration, energy utilization in transpiration, factors affecting ET, control of ET by mulching and use of anti-transpirents; fertilizer use in relation to irrigation.

Unit V

Crop water stress – water deficits and crop growth, adoptability to the crops. Water availability with relation to nutrient availability.

Unit VI

Application of irrigation water, conveyance and distribution system, irrigation efficiency; agronomic considerations in the design and operation of irrigation projects; characteristics of irrigation and farming systems

affecting irrigation management.

Unit VII

Strategies of using limited water supply; factors affecting ET, control of ET by mulching and use of anti-transpirants; fertilizer use in relation to irrigation; optimizing the use of given irrigation supplies.

Unit VIII

Land suitability for irrigation, land irrigability classification; integrated water management in command areas, institution of water management in commands, farmer's participation in command areas; irrigation legislation.

Unit IX

Economic analysis of irrigation and crop planning for optimum use of irrigation water

Unit X

Crop water production function

II. Practical

- Determination of water infiltration characteristics and water holding capacity of soil profiles.
- Determination Moisture extraction pattern of crops
- Determination of water balance component of transplanted rice by drum culture technique
- Determination of consumptive use and water requirement of a given cropping pattern
- Determination of crop efficient of one important crop
- Planning, designing and installation of drip irrigation system
- Planning, designing and installation of sprinkler irrigation system
- Designing of drainage channel
- Measurement of irrigation efficiencies
- Determination of irrigation timing under different methods of irrigation
- Visit to irrigation command area

ADDITION

Theory

- Water resources of U.P.
- Water budgeting.

- Efficient water management in water scarce conditions

Practical

Determination of crop efficient of one important crop

Course Title: Recent Trends in Weed Management

Course Code: Agron 604

Credit Hours : 2+0

Aim of the course

To teach about the changing weed flora, new herbicides, their resistance, toxicity, antidotes and residue management under different cropping systems.

I. Theory

Unit I

Crop-weed competition in different cropping situations; changes in weed flora, various causes and effects; different methods of weed management. Migration, introduction, adaptation of weeds, Invasive weeds – biology and management. Different mechanisms of invasion – present status and factors influencing weed invasion.

Unit II

Physiological and biological aspects of herbicides, their absorption, translocation, metabolism and mode of action; selectivity of herbicides and factors affecting them.

Unit III

Climatic factors and phytotoxicity of herbicides; fate of herbicides in soil and factors affecting them, Degradation of herbicides in soil and plants-factors affecting it, primary and secondary metabolites, residue management of herbicides, adjuvants.

Unit IV

Advances in herbicide products and application techniques and methods; herbicide resistance; antidotes and crop protection compatibility of herbicides of different groups; compatibility of herbicides with other pesticides; herbicide rotation and herbicide mixtures.

Unit V

Development of transgenic herbicide resistant crops; herbicide development, registration procedures.

Unit VI

Relationship of herbicides with tillage, fertilizer, and irrigation, cropping system; bioherbicides, allelochemical and alleloherbicides, herbicide bioassays. Recent advances in nonchemical weed management including deleterious rhizobacteria, robotics, biodegradable film, etc.

ADDITION

Theory

- Use of drones for efficient and site specific weed management
- Strategies for herbicide residue free and safe food production

Course Title : Integrated Farming Systems and Sustainable Agriculture
Course Code: Agron 605

Credit Hours: 2+0

Aim of the course

To apprise about different enterprises suitable for different agroclimatic conditions for sustainable agriculture.

I. Theory

Unit I

Integrated Farming systems (IFS): definition, scope and importance; classification of IFS based on enterprises as well as under rainfed/irrigated condition in different land situation. farming systems according to type of rotation, intensity of rotation, degree of commercialization, water supply, enterprises.

Unit II

Concept of sustainability in of Integrated farming systems; efficient Integrated farming systems based on economic viability and natural resources - identification and management.

Unit III

Production potential of different components of Integrated farming systems; interaction and mechanism of different production factors; stability of Integrated Farming system based on research/long term information. in different systems through research; eco-physiological approaches to intercropping. Integration of components and adaptability of different farming system based on land situations and climatic condition of a region; evaluation of IFS.

Unit IV

Simulation models for intercropping; soil nutrient in intercropping; preparation of different farming system models; evaluation of different farming systems. Formation of different Integrated Farming system Models: evaluation of different Integrated Farming system models. Recycling of organic waste in farming system, in IFS.

Unit V

New concepts and approaches of farming system and organic farming; value addition, waste recycling, quantification and mitigation of Green House gases; case studies/ success stories of different Integrated Farming systems. cropping systems and organic farming; case studies on different farming systems. Possible use of ITK in Integrated farming system.

ADDITION

Theory

- Efficient use of resource in existing IFS for long term sustainability

Course Title : Soil Conservation and Watershed Management
Course Code : Agron 606
Credit Hours : 2+1

Aim of the course

To teach about different soil moisture conservation technologies for enhancing the agricultural productivity through holistic approach watershed management.

I. Theory

Unit I

Soil erosion: definition, nature of erosion; type of erosion, factors affecting erosion

Unit II

Soil conservation: definition, methods of soil conservation; agronomic measures - contour cultivation, strip cropping, cover crops; mulching, tillage, cropping system vegetative barriers; improved dry farming practices; mechanical measures - bunding, gully control, bench terracing; role of grasses and pastures in soil conservation; wind breaks and shelter belts.

Unit III

Watershed management: definition, objectives, concepts, approach, components, steps in implementation of watershed; development of cropping systems for watershed areas.

Unit IV

Land use capability classification, alternate land use systems; agro-forestry; ley farming; *jhum* management - basic concepts, socio-ethnic aspects, its layout.

Unit V

Drainage, methods of drainage, Drainage considerations and agronomic management; rehabilitation of abandoned *jhum* lands and measures to prevent soil erosion.

III. Practical

- Study of different types of erosion
- Determination of dispersion ratio
- Estimation of soil loss by Universal Soil Loss Equation
- Estimation of soil loss by wind erosion
- Measurement of runoff and soil loss
- Field studies of different soil conservation measures
- Laying out run-off plot and deciding treatments
- Identification of different grasses and trees for soil conservation
- Visit to watershed areas

- Visit to a soil conservation research centre, demonstration and training centre

ADDITION

Theory

- Use of modern tools and techniques for Reclamation of eroded lands
- Use of drones for efficient watershed management

Title: Research and Publication Ethics

Course Code: Agron 608

Credit Hours : 0+2

I. Theory

Unit I

Introduction to philosophy: definition, nature and scope, concept, branches

Unit II

Ethics: definition, moral philosophy, nature of moral judgements and reactions

Unit III

Scientific conduct: Ethics with respect to science and research, intellectual honesty and research integrity, Scientific misconducts- falsifications, fabrications and plagiarism (FFP): Redundant publications: duplicate and overlapping publications, salami slicing; selective reporting and misrepresentation of data

Unit IV

Publication ethics: Definition, introduction and importance. Best practices/standard setting initiatives and guidelines: COPE, WAME, etc., conflicts of interest. Publication misconduct: definition, concept, problems that lead to unethical behaviour and vice versa, type, violation of publication ethics, authorship and contributorship, Identification of publication misconduct, complaints and appeals, predatory publishers and journals

Unit V

Open access publishing: open access publication and initiatives: SHERPA, RoMEO online resource to check publisher copy right and self archiving policies; software tool to identify predatory publications developed by SPPU, Journal finder/journal suggestions tools viz.. JANE, Elsevier Journal Finder, Springer Journal Suggester etc.

Unit VI

Publication misconduct: Group discussions- subject specific ethical issues, FFP, authorship, conflicts of interest, complaints and appeals examples and fraud from India and abroad. Software tools: Use of plagiarism software like Turnitin, Urkund and other open source software tools

Unit VII

Database and Research metrics: INDEXING DATA BASE, citation database, web of science, scopus, etc. Impact factor of journal as per journal citation

report, SNIP, SJR, IPP, Cite Score; Metrics: h-index, g-index, i10-index altmetrics.

ADDITION

- Base in accessibility for publication at right forum

तकनीकी महाविद्यालय

सरदार वल्लभभाई पटेल कृषि एवं प्रौद्योगिक विश्वविद्यालय, मेरठ-250110

डा० बी० आर० सिंह
अधिष्ठाता तकनीकी



पत्रांक :- सवप / COT / 2022 / 774
दिनांक: 27.08.2022

सेवा में

कुलसचिव

स.व.प. कृषि एवं प्रौद्योगिक विश्वविद्यालय मेरठ।

विषय:- दिनांक 29.08.2022 को प्रस्तावित माननीय विद्वत परिषद की बैठक हेतु एजेंडा के संबंध में।

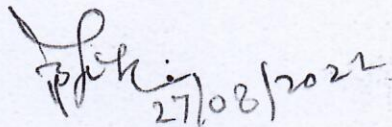
महोदय,

कृपया उपरोक्त विषयक आपके कार्यालय के पत्रांक संख्या- स.व.प./2022/कुस०/11250, दिनांक 23.08.2022 के कम में कृषि महाविद्यालय में संचालित U.G. कोर्स प्रोग्राम B.Sc. Ag. (Hons) Agriculture के अन्तर्गत कृषि अभियन्त्रण विभाग से पढाए जाने वाले निम्न कोर्स-

Course Code	Name Of Course	Credit Hours
AGE- 112	Farm Machinery and Power	2(1+1)
AGE- 121	Soil and Water Conservation Engineering	2(1+1)
AGE - 211	Environmental Studies & Disaster Management	3(2+1)
AGE-222	Renewable Energy and Green Technology	2(1+1)
AGE - 322	Post-harvest Management and Value Addition of fruits and Vegetables	2(1+1)

के Syllabus में वर्तमान परिपेक्ष्य के अनुरूप आंशिक संशोधन करते हुए (वर्तमान में संचालित पाठ्यक्रमों के Syllabus की छायाप्रति व उक्त Syllabus की संशोधित छायाप्रति) एजेंडा के रूप में माननीय विद्वत परिषद के विचारार्थ संलग्न कर प्रेषित किया जा रहा है। महोदय के सुलभ संन्दर्भ एवं आवश्यक कार्यवाही हेतु प्रेषित।

संलग्नक :- यथोपरी


27/08/2022
डा० बी० आर० सिंह

प्रतिलिपि:-

1. अधिष्ठाता, कृषि महोदय को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।
2. माननीय कुलपति जी के निजी सहायक को माननीय कुलपति जी के अवलोकनार्थ।

डा० बी० आर० सिंह

Existing one

Course title : Farm Machinery and Power Credit:2(1+1)

Theory

Status of Farm Power in India, Sources of Farm Power , I.C. engines, working principles of I C engines, comparison of two stroke and four stroke cycle engines , Study of different components of I.C. engine, I.C. engine terminology and solved problems, Familiarization with different systems of I.C. engines: Comprehension, ignition and spark ignition engine, Air cleaning, cooling, lubrication ,fuel supply and hydraulic control system of a tractor, Familiarization with Power transmission system : clutch, gear box, differential and final drive of a tractor , Tractor types, Cost analysis of tractor power and attached implement, Familiarization with Primary and Secondary Tillage implement, Implement for hill agriculture, implement for intercultural operations, Familiarization with sowing and planting equipment, calibration of a seed drill and solved examples, Familiarization with Plant Protection equipment, Familiarization with harvesting and threshing equipment.

Practicals

Study of different components of I.C. engine. To study air cleaning and cooling system of engine, Familiarization with clutch, transmission, differential and final drive of a tractor, Familiarization with lubrication and fuel supply system of engine, Familiarization with brake, steering, hydraulic control system of engine, Learning of tractor driving, Familiarization with operation of power tiller, Implements for hill agriculture, Familiarization with different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow. Familiarization with seed-cum fertilizer drills their seed metering mechanism and calibration, planters and transplanter Familiarization with different types of sprayers and dusters Familiarization with different inter- cultivation equipment, Familiarization with harvesting and threshing machinery

Revised One

Course title : Farm Machinery and Power Credit:2(1+1)

Theory

Study of sources of farm power -conventional & non-conventional energy sources , Status of Farm Power in India , **Classification of tractors and IC engines**, I.C. engines, working principles of I C engines, comparison of two stroke and four stroke cycle engines , Study of different components of I.C. engine, I.C. engine terminology and solved problems, Familiarization with different systems of I.C. engines: Comprehension, ignition and spark ignition engine, Air cleaning, cooling, lubrication ,fuel supply and hydraulic control system of a tractor, Familiarization with Power transmission system : **Study of need for transmission system in a tractor. Transmission system - types, major functional systems** , clutch, gear box, differential and final drive of a tractor , Tractor types, **Introduction to farm mechanization. Classification of farm machines**, Familiarization with Primary and Secondary Tillage implement, Implement for hill agriculture, implement for intercultural operations, Familiarization with sowing and planting equipment, calibration of a seed drill and solved examples, Familiarization with Plant Protection equipment, Familiarization with harvesting and threshing equipment.

Practicals

Study of different components of I.C. engine. To study air cleaning and cooling system of engine, Familiarization with clutch, transmission, differential and final drive of a tractor, Familiarization with lubrication and fuel supply system of engine, Familiarization with brake, steering, hydraulic control system of engine, Learning of tractor driving, Familiarization with operation of power tiller, Implements for hill agriculture, Familiarization with different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow. Familiarization with seed-cum fertilizer drills their seed metering mechanism and calibration, planters and transplanter Familiarization with different types of sprayers and dusters Familiarization with different inter- cultivation equipment, Familiarization with **harvesting equipment, Reaper, Combined harvester** and threshing machine **Multicrop thresher**.

Existing file

Course title : Introductory Soil and Water Conservation Engineering:2(1+1)

Theory

Introduction to Soil and Water Conservation, causes of soil erosion. Definition and agents of soil erosion, water erosion: Forms of water erosion. Gully classification and control measures. Soil loss estimation by universal Loss Soil Equation. Soil loss measurement techniques. Principles of erosion control: Introduction to contouring, strip cropping, Contour bund, Graded bund and bench terracing, Grassed water ways and their design, Water harvesting and its techniques. Wind erosion: mechanics of wind erosion, types of soil movement. Principles of wind erosion control and its control measures.

Practical

General status of soil conservation in India. Calculation of erosion index. Estimation of soil loss. Measurement of soil loss. Preparation of contour maps. Design of grassed water ways. Design of contour bunds. Design of graded bunds. Design of bench terracing system. Problem on wind erosion.

Revised file

AGE- 121 Introductory Soil and Water Conservation Engineering 2(1+1)

Theory

Introduction to Soil and Water Conservation, **causes and types - geological and accelerated erosion, agents, factors affecting and effects of erosion.** Definition of soil erosion, water erosion: **Mechanics and** Forms of water erosion. Runoff, factors affecting runoff, estimation and measurement. Gully classification and control measures. Soil loss estimation by universal Loss Soil Equation **and MUSLE. Rainfall erosivity - estimation by $KE > 25$ and EI_{30} methods.** Soil loss measurement techniques. Principles of erosion control: Introduction to contouring, strip cropping, Contour bund, Graded bund and bench terracing, Grassed water ways and their design, Water harvesting and its techniques. Wind erosion: mechanics of wind erosion, types of soil movement. Principles of wind erosion control and its control measures

AGE- 211/SAC-211/AGR-211 **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-spots 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, and 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.

Revised file

AGE- 211/SAC-211/AGR-211 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-spots 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, and 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, Role of Indian & other regions & culture in environmental conservation, Environmental communication & public awareness; Case studies

Existing one

Course title : Renewable Energy and Green Technology Credit: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 bio-oil 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.

Revised One

Course title : Renewable Energy and Green Technology Credit:2(1+1)

Theory

Classification of energy sources, **renewable- non renewable, conventional- non conventional energy sources, Comparison of renewable energy sources with non renewable sources**, Familiarization with biomass utilization for biofuel production and their application, Familiarization with types of biogas plants and gasifiers, bioalcohol, biodiesel and bio-oil production and their utilization as bioenergy resource, introduction of solar energy, collection and their application, **Flat plate and Concentrating collectors, different solar thermal devices, Principle of natural and forced convection drying system**, 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 **Types of Windmill rotors**.

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.

Existing One

Course title : Post-harvest Management and Value Addition of Fruits and Vegetables

Credit: 2(1+1)

Theory

Importance of post-harvest processing of fruits and vegetables, extent and possible causes of post harvest losses; Pre-harvest factors affecting postharvest quality, maturity, ripening and changes occurring during ripening; Respiration and factors affecting respiration rate; Harvesting and field handling; Storage (ZECC, cold storage, CA, MA, and hypobaric); Value addition concept; Principles and methods of preservation; Intermediate moisture food- Jam, jelly, marmalade, preserve, candy – Concepts and Standards; Fermented and non-fermented beverages, Tomato products- Concepts and Standards; Drying/ Dehydration of fruits and vegetables – Concept and methods, osmotic drying, Canning – Concepts and Standards, packaging of products.

Practical

Applications of different types of packaging, containers for shelf life extension, Effect of temperature on shelf life and quality of produce, Demonstration of chilling and freezing injury in vegetables and fruits, Extraction and preservation of pulps and juices, Preparation of jam, jelly, RTS, nectar, squash, osmotically dried products, fruit bar and candy and tomato products, canned products, Quality evaluation of products -- physico-chemical and sensory, Visit to processing unit/industry.

Revised one

Course title : Post-harvest Management and Value Addition of Fruits and Vegetables

Theory

Importance of post-harvest processing of fruits and vegetables, **Pre-cooling methods**, Pre-harvest factors affecting postharvest quality, maturity, ripening and changes occurring during ripening; Respiration and factors affecting respiration rate; Harvesting and field handling; Storage (ZECC, cold storage, CA, MA, and hypobaric); Value addition concept; Principles and methods of preservation; Intermediate moisture food- Jam, jelly, marmalade, preserve, candy – Concepts and Standards; Fermented and non-fermented beverages, Tomato products- Concepts and Standards; Drying/ Dehydration of fruits and vegetables – Concept and methods, osmotic drying, Canning – Concepts and Standards, packaging of products.

Practical

Applications of different types of packaging, containers for shelf life extension, Effect of temperature on shelf life and quality of produce, Demonstration of chilling and freezing injury in vegetables and fruits, Extraction and preservation of pulps and juices, Preparation of jam, jelly, RTS, nectar, squash, osmotically dried products, fruit bar and candy and tomato products, canned products, Quality evaluation of products -- physico-chemical and sensory, Visit to processing unit/industry.

To,
Dean Ag.

Department of Soil Science & Agricultural Chemistry
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut – 250 110

Revised Syllabus of UG Programme – 2022-23

New modified course syllabus (Addition / Deletion) of UG Programme

Dispatch No. 4339
Date 26/08/2022
Deptt. of Soil Science & Agricultural Chemi
College of Agriculture
S.V.P. Uni. of Ag. & Tech- Meerut-250110

S. No.	Old Course as per V th Dean's committee report	After Modified Course
1.	<p>SAC-111 Fundamentals of Soil Science 3 (2+1)</p> <p>Theory Soil as a natural body, Pedological and edaphological concepts of soil; Soil genesis: soil forming rocks and minerals; weathering, processes and factors of soil formation; Soil Profile, components of soil; Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity; Elementary knowledge of soil taxonomy classification and soils of India; Soil water retention, movement and availability; Soil air, composition, gaseous exchange, problem and plant growth, Soil temperature; source, amount and flow of heat in soil; effect on plant growth, Soil reaction-pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability; soil colloids - inorganic and organic; silicate clays: constitution and properties; sources of charge; ion exchange, cation exchange capacity, base saturation; soil organic matter: composition, properties and its influence on soil properties; humic substances - nature and properties. Soil pollution - behaviour of pesticides and inorganic contaminants, prevention and mitigation of soil pollution.</p> <p>Practical Study of soil profile in field. Study of soil sampling tools, collection of representative soil sample, its processing and</p>	<p>SAC-111 Fundamentals of Soil Science 3 (2+1)</p> <p>Theory Soil as a natural body, Pedological and edaphological concepts of soil; Soil genesis: soil forming rocks and minerals; weathering, processes and factors of soil formation; Soil Profile, components of soil; Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity; Elementary knowledge of soil taxonomy classification and soils of India; Soil water retention, movement and availability; Soil air, composition, gaseous exchange, problem and plant growth, Soil temperature; source, amount and flow of heat in soil; effect on plant growth, Soil reaction-pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability; soil colloids - inorganic and organic; silicate clays: constitution and properties; sources of charge; ion exchange, cation exchange capacity, base saturation; soil organic matter: composition, properties and its influence on soil properties; humic substances - nature and properties.</p> <p>Practical Study of soil profile in field. Study of soil sampling tools, collection of representative soil sample, its processing and storage. Study of soil forming rocks and minerals. Determination of soil density, moisture content and porosity.</p>

Dean
College of Agriculture

	<p>storage. Study of soil forming rocks and minerals. Determination of soil density, moisture content and porosity. Determination of soil texture by feel and Bouyoucos Methods. Studies of capillary rise phenomenon of water in soil column and water movement in soil. Determination of soil pH and electrical conductivity. Determination of cation exchange capacity of soil. Study of soil map. Determination of soil colour. Demonstration of heat transfer in soil. Estimation of organic matter content of soil.</p>	<p>Determination of soil texture by feel and Bouyoucos Methods. Studies of capillary rise phenomenon of water in soil column and water movement in soil. Determination of soil pH and electrical conductivity. Determination of cation exchange capacity of soil. Study of soil map. Determination of soil colour. Demonstration of heat transfer in soil. Estimation of organic matter content of soil.</p> <p>Deletion: Soil organisms: macro and micro organisms, their beneficial and harmful effects. Soil pollution - behaviour of pesticides and inorganic contaminants, prevention and mitigation of soil pollution.</p>
2.	<p>SAC-311 Manures, Fertilizers and Soil Fertility Management 3(2+1)</p> <p>Theory Introduction and importance of organic manures, properties and methods of preparation of bulky and concentrated manures. Green/leaf manuring. Fertilizer recommendation approaches. Integrated nutrient management. Chemical fertilizers: classification, composition and properties of major nitrogenous, phosphatic, potassic fertilizers, secondary & micronutrient fertilizers, Complex fertilizers, nano fertilizers. Soil amendments, Fertilizer Storage, Fertilizer Control Order. History of soil fertility and plant nutrition. Criteria of essentiality. role, deficiency and toxicity symptoms of essential plant nutrients, Mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants. Chemistry of soil nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and micronutrients. Soil fertility evaluation, Soil testing. Critical levels of different nutrients in soil. Forms of nutrients in soil, plant analysis, rapid plant tissue tests. Indicator plants. Methods of fertilizer recommendations to crops. Factor influencing nutrient use</p>	<p>SAC-311 Manures, Fertilizers and Soil Fertility Management 3(2+1)</p> <p>Theory Introduction and importance of organic manures, bulky and concentrated manures, Preparation methods of organic manures. Green/leaf manuring and locally available organic sources. Integrated nutrient management. Chemical fertilizers: classification, composition and properties of major nitrogenous, phosphatic, potassic fertilizers, secondary & micronutrient fertilizers, Complex fertilizers, nano fertilizers, Fertilizer Control Order. History of soil fertility and plant nutrition. Criteria of essentiality. role, deficiency and toxicity symptoms of essential plant nutrients, Classification of Essential Elements. Forms of nutrient for plant absorption. Movement of plant nutrients from soil to plant roots Chemistry of soil nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and micronutrients. Soil fertility evaluation, Soil testing. Critical levels of different nutrients in soil. plant analysis, rapid plant tissue tests. Indicator plants. Methods of fertilizer recommendations to crops. Factor influencing nutrient use efficiency (NUE), methods of application under</p>

	<p>efficiency (NUE), methods of application under rainfed and irrigated conditions.</p> <p>Practical Introduction of analytical instruments and their principles, calibration and applications, Colorimetry and flame photometry. Estimation of soil organic carbon, Estimation of alkaline hydrolysable N in soils. Estimation of soil extractable P in soils. Estimation of exchangeable K; Ca and Mg in soils . Estimation of soil extractable S in soils.. Estimation of DTPA extractable Zn in soils. Estimation of N in plants. Estimation of P in plants. Estimation of K in plants. Estimation of S in plants.</p>	<p>rainfed and irrigated conditions.</p> <p>Practical Introduction of analytical instruments and their principles, calibration and applications, Colorimetry and flame photometry. Estimation of soil organic carbon, Estimation of alkaline hydrolysable N in soils. Estimation of soil extractable P in soils. Estimation of exchangeable K; Ca and Mg in soils. Estimation of soil extractable S in soils. Estimation of DTPA extractable Zn in soils. Estimation of N in plants. Estimation of P in plants. Estimation of K in plants. Estimation of S in plants.</p> <p>Deletion: Fertilizer recommendation approaches. Soil amendments, Mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants. Forms of nutrients in soil, Fertilizer Storage,</p> <p>Addition: Locally available organic sources, Movement of plant nutrients from soil to plant roots, Forms of nutrient for plant absorption .Classification of Essential Elements</p>
3.	<p>SAC-221 Problematic Soils and their Management (New) 2(2+0)</p> <p>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.</p>	<p>SAC-221 Problematic Soils and their Management (New) 2(2+0)</p> <p>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.</p>

		Addition: Field visit for locally problematic soils. Deletion: Problematic soils under different Agro-ecosystems.
4.	SAC-121 Agricultural Microbiology 2(1+1) Theory Introduction. Microbial world: Prokaryotic and eukaryotic microbes. Bacteria: cell structure, chemoautotrophy, photo autotrophy, growth. Bacterial genetics: Genetic recombination transformation, conjugation and transduction, plasmids, transposon. Role of microbes in soil fertility and crop production: Carbon, Nitrogen, Phosphorus and Sulphur cycles. Biological nitrogen fixation- symbiotic, associative and asymbiotic. Azolla, blue green algae and mycorrhiza. Rhizosphere and phyllosphere. Microbes in human welfare: silage production, biofertilizers, biopesticides, biofuel production and biodegradation of agro-waste. Practical Introduction to microbiology laboratory and its equipments; Microscope- parts, principles of microscopy, resolving power and numerical aperture. Methods of sterilization. Nutritional media and their preparations. Enumeration of microbial population in soil- bacteria, fungi, actinomycetes. Methods of isolation and purification of microbial cultures. Isolation of <i>Rhizobium</i> from legume root nodule. Isolation of <i>Azotobacter</i> from soil. Isolation of <i>Azospirillum</i> from roots. Isolation of BGA. Staining and microscopic examination of microbes.	SAC-121 Agricultural Microbiology 2(1+1) Theory Introduction. Microbial world: Prokaryotic and eukaryotic microbes. Bacteria: cell structure, chemoautotrophy, photo autotrophy, growth. Bacterial genetics: Genetic recombination transformation, conjugation and transduction, plasmids, transposon. Role of microbes in soil fertility and crop production: Carbon, Nitrogen, Phosphorus and Sulphur cycles. Biological nitrogen fixation- symbiotic, associative and asymbiotic. Azolla, blue green algae and mycorrhiza. Rhizosphere and phyllosphere. Microbes in human welfare: silage production, biofertilizers. Practical Introduction to microbiology laboratory and its equipments; Microscope- parts, principles of microscopy, resolving power and numerical aperture. Methods of sterilization. Nutritional media and their preparations. Enumeration of microbial population in soil- bacteria, fungi, actinomycetes. Methods of isolation and purification of microbial cultures. Isolation of <i>Rhizobium</i> from legume root nodule. Isolation of <i>Azotobacter</i> from soil. Isolation of <i>Azospirillum</i> from roots. Isolation of BGA. Staining and microscopic examination of microbes. Deletion: Biopesticides, biofuel production and biodegradation of agro-waste

5.	<p>SAC-222 Agrochemicals 3 (2+1)</p> <p>Theory An introduction to agrochemicals, their type and role in agriculture, effect on environment, soil, human and animal health, merits and demerits of their uses in agriculture, management of agrochemicals for sustainable agriculture. Herbicides-Major classes, properties and important herbicides. Fate of herbicides. Fungicides - Classification – Inorganic fungicides - characteristics, preparation and use of sulfur and copper, Mode of action-Bordeaux mixture and copper oxychloride. Organic fungicides- Mode of action-Dithiocarbamates-characteristics, preparation and use of Zineb and maneb. Systemic fungicides- Benomyl, carboxin, oxycarboxin, Metalaxyl, Carbendazim, characteristics and use. Introduction and classification of insecticides: inorganic and organic insecticides Organochlorine, Organophosphates, Carbamates, Synthetic pyrethroids, Neonicotinoids, Biorationals, Insecticide Act and rules, Insecticides banned, withdrawn and restricted use, Fate of insecticides in soil & plant. IGRs Biopesticides, Reduced risk insecticides, Botanicals, plant and animal systemic insecticides their characteristics and uses. Fertilizers and their importance. Nitrogenous fertilizers: Feedstocks and Manufacturing of ammonium sulphate, ammonium nitrate, ammonium chloride, urea. Slow release N-fertilizers. Phosphatic fertilizers: feedstock and manufacturing of single superphosphate. Preparation of bone meal and basic slag. Potassic fertilizers: Natural sources of potash, manufacturing of potassium chloride, potassium sulphate and potassium nitrate. Mixed and complex fertilizers: Sources and compatibility-preparation of major, secondary and micronutrient mixtures. Complex fertilizers: Manufacturing of ammonium phosphates, nitrophosphates and NPK complexes. Fertilizer control order.</p>	<p>SAC-222 Agrochemicals 3 (2+1)</p> <p>Theory An introduction to agrochemicals, their type and role in agriculture, effect on environment, soil, human and animal health, merits and demerits of their uses in agriculture, management of agrochemicals for sustainable agriculture. Herbicides-Major classes, properties and important herbicides. Fate of herbicides. Fungicides - Classification – Inorganic fungicides - characteristics, preparation and use of sulfur and copper, Mode of action-Bordeaux mixture and copper oxychloride. Organic fungicides- Mode of action-Dithiocarbamates-characteristics, preparation and use of Zineb and maneb. Systemic fungicides- Benomyl, carboxin, oxycarboxin, Metalaxyl, Carbendazim, characteristics and use. Introduction and classification of insecticides: inorganic and organic insecticides Organochlorine, Organophosphates, Carbamates, Synthetic pyrethroids, Neonicotinoids, Biorationals, Insecticide Act and rules, Insecticides banned, withdrawn and restricted use, Fate of insecticides in soil & plant. IGRs Biopesticides, Reduced risk insecticides, Botanicals, plant and animal systemic insecticides their characteristics and uses. Fertilizers and their importance. Nitrogenous fertilizers: Feedstocks and Manufacturing of ammonium sulphate, ammonium nitrate, ammonium chloride, urea. Slow release N-fertilizers. Phosphatic fertilizers: feedstock and manufacturing of single superphosphate. Preparation of bone meal and basic slag. Potassic fertilizers: Natural sources of potash, manufacturing of potassium chloride, potassium sulphate and potassium nitrate. Mixed and complex fertilizers: Sources and compatibility-preparation of major, secondary and micronutrient mixtures. Complex fertilizers: Manufacturing of ammonium phosphates, nitrophosphates and NPK complexes. Fertilizer control order.</p>
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Rhizobium and Frankia; Cynobacterial biofertilizers- Anabaena, Nostoc, Hapalosiphon and fungal biofertilizers- AM mycorrhiza and ectomycorrhiza. Nitrogen fixation frees living and symbiotic nitrogen fixation. Mechanism of phosphate solubilization and phosphate mobilization, K solubilization. Production technology: Strain selection, sterilization, growth and fermentation, mass production of carrier based and liquid biofertilizers. FCO specifications and quality control of biofertilizers. Application technology for seeds, seedlings, tubers, sets etc. Biofertilizers -Storage, shelf life, quality control and marketing. Factors influencing the efficacy of biofertilizers.

Practical

Isolation and purification of important biopesticides: Trichoderma Pseudomonas, Bacillus, Metarhizium etc. and its production. Identification of important botanicals. Visit to biopesticide laboratory in nearby area. Field visit to explore naturally infected cadavers. Identification of entomopathogenic entities in field condition. Quality control of biopesticides. Isolation and purification of Azospirillum, Azotobacter, Rhizobium. P-solubilizers and cyanobacteria. Mass multiplication and inoculums production of biofertilizers. Isolation of AM fungi -Wet sieving method and sucrose gradient method. Mass production of AM inoculants.

Rhizobium and Frankia; Cynobacterial biofertilizers- Anabaena, Nostoc, Hapalosiphon and fungal biofertilizers- AM mycorrhiza and ectomycorrhiza. Mechanism of phosphate solubilization and phosphate mobilization, K solubilization. Production technology: Strain selection, sterilization, growth and fermentation, mass production of carrier based and liquid biofertilizers. FCO specifications and quality control of biofertilizers. Application technology for seeds, seedlings, tubers, sets etc. Biofertilizers -Storage, shelf life, quality control and marketing. Factors influencing the efficacy of biofertilizers.

Practical

Isolation and purification of important biopesticides: Trichoderma Pseudomonas, Bacillus, Metarhizium etc. and its production. Identification of important botanicals. Visit to biopesticide laboratory in nearby area. Field visit to explore naturally infected cadavers. Identification of entomopathogenic entities in field condition. Quality control of biopesticides. Isolation and purification of Azospirillum, Azotobacter, Rhizobium, P-solubilizers and cyanobacteria. Mass multiplication and inoculums production of biofertilizers. Isolation of AM fungi -Wet sieving method and sucrose gradient method. Mass production of AM inoculants.

Addition: visit of biopesticides and bio-fertilizer lab / industry / institute.

Deletion: Nitrogen fixation -Free living and symbiotic nitrogen fixation.

(Satendra Kumar)

Prof. & Head

SSAC

Head

Deptt of Soil Science & Agricultural Chemistry
S.V.P. Uni. of Ag. & Tech. Meerut-250110

U.G. Courses of the Department of Genetics and Plant breeding

S. No.	Course code	Name of the course	Credit hours
A. College of Agriculture (B.Sc. Hons. Ag.)			
1	GPB 121	Fundamentals of Genetics	3(2+1)
2	GPB 221	Principles of Seed Technology	3(2+1)
3	GPB 211	Fundamentals of Plant Breeding	3(2+1)
4	GPB 311	Crop Improvement-I for <i>kharif</i> Crops	2(1+1)
5	GPB 321	Crop Improvement-II for <i>rabi</i> Crops	2(1+1)
6	UGE 223	Commercial Plant Breeding	3 (1+2)
B. College of Biotechnology (B.Tech. Biotech.)			
7	BTM 111	Basic Genetics (BG)	3(2-0-1)
8	GBP 212	Breeding of Field Crops (BFC)	3 (2 + 1)
9	BTE 310 (GPB 1.2)	Seed Production of Field Crops (SPFC)	3 (1 + 2)
C. College of Horticulture (B.Sc. Horti.)			
10	HPB 111	Principles of Plant Breeding (PPB)	3(2-0-1)

Asim
(Atar Singh)
Asst. prof. GPB

Enclosed 05 pages.

Sh. Bhatt
by

**Revised Syllabus for UG Degree Programme
(B.Sc. (Hons.) Agriculture)
(As per ICAR Recommendations for U.G. Degree)**



Department of Genetics and Plant Breeding

Sardar Vallabhbhai Patel University of Agriculture & Technology Meerut – 250110 (U.P.)

UG Degree Programme (B.Sc. (Hons.) Agriculture) (Genetics and Plant Breeding)

Original syllabus	Add Content	Suggested syllabus
1. GPB 121- Fundamentals of Genetics- Credit hours 3(2+1)		
Theory Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity. Architecture of chromosome; chromonemata, chromosome matrix, chromomeres, centromere, secondary constriction and telomere; special types of chromosomes. Chromosomal theory of inheritance- cell cycle and cell division- mitosis and meiosis. Probability and Chi-square. Dominance relationships, Epistatic interactions with example. Multiple alleles, pleiotropism and pseudoalleles, Sex determination and sex linkage, sex limited and sex influenced traits, Blood group genetics, Linkage and its estimation, crossing over mechanisms, chromosome mapping. Structural and numerical variations in chromosome and their implications, Use of haploids, dihaploids and doubled haploids in Genetics. Mutation, classification, Methods of inducing mutations & CIB technique, mutagenic agents and induction of mutation. Qualitative & Quantitative traits, Polygenes and continuous variations, multiple factor hypothesis, Cytoplasmic inheritance. Genetic disorders. Nature, structure & replication of genetic material. Protein synthesis, Transcription and translational mechanism of genetic material, Gene concept: Gene structure, function and regulation, Lac and Trp operons.	Landmarks of genetics	Theory Landmarks of genetics. Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity. Architecture of chromosome; chromonemata, chromosome matrix, chromomeres, centromere, secondary constriction and telomere; special types of chromosomes. Chromosomal theory of inheritance- cell cycle and cell division- mitosis and meiosis. Probability and Chi-square. Dominance relationships, Epistatic interactions with example. Multiple alleles, pleiotropism and pseudoalleles, Sex determination and sex linkage, sex limited and sex influenced traits, Blood group genetics, Linkage and its estimation, crossing over mechanisms, chromosome mapping. Structural and numerical variations in chromosome and their implications, Use of haploids, dihaploids and doubled haploids in Genetics. Mutation, classification, Methods of inducing mutations & CIB technique, mutagenic agents and induction of mutation. Qualitative & Quantitative traits, Polygenes and continuous variations, multiple factor hypothesis, Cytoplasmic inheritance. Genetic disorders. Nature, structure & replication of genetic material. Protein synthesis, Transcription and translational mechanism of genetic material, Gene concept: Gene structure, function and regulation, Lac and Trp operons.
Practical Study of microscope. Study of cell structure. Mitosis and Meiosis cell division. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross, Experiments on epistatic interactions including test cross and back cross, Practice on mitotic and meiotic cell division, Experiments on probability and Chi-square test. Determination of		Practical Study of microscope. Study of cell structure. Mitosis and Meiosis cell division. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross, Experiments on epistatic interactions including test cross and back cross, Practice on mitotic and meiotic cell division, Experiments on probability and Chi-square test. Determination of

linkage and crossover analysis (through two point test cross and three point test cross data). Study on sex linked inheritance in Drosophila. Study of models on DNA and RNA structures.		linkage and crossover analysis (through two point test cross and three point test cross data). Study on sex linked inheritance in Drosophila. Study of models on DNA and RNA structures.
2. GPB 211 - Fundamentals of Plant Breeding 3(2+1) Credit hours		
Theory Historical development, concept, nature and role of plant breeding, major achievements and future prospects; Genetics in relation to plant breeding, modes of reproduction and apomixes, self-incompatibility and male sterility- genetic consequences, cultivar options. Domestication, Acclimatization and Introduction; Centres of origin/diversity, components of Genetic variation; Heritability and genetic advance; Genetic basis and breeding methods in self- pollinated crops - mass and pure line selection, hybridization techniques and handling of segregating population; Multiline concept. Concepts of population genetics and Hardy-Weinberg Law, Genetic basis and methods of breeding cross pollinated crops, modes of selection; Population improvement Schemes- Ear to row method, Modified Ear to Row, recurrent selection schemes; Heterosis and inbreeding depression, development of inbred lines and hybrids, composite and synthetic varieties; Breeding methods in asexually propagated crops, clonal selection and hybridization; Maintenance of breeding records and data collection; Wide hybridization and pre-breeding; Polyploidy in relation to plant breeding, mutation breeding-methods and uses; Breeding for important biotic and abiotic stresses; Biotechnological tools-DNA markers and marker assisted selection. Participatory plant breeding;	Activities in Plant Breeding	Theory Historical development, concept, nature, activities in Plant Breeding and role of plant breeding. Major achievements and future prospects; Genetics in relation to plant breeding, modes of reproduction and apomixes, self-incompatibility and male sterility- genetic consequences, cultivar options. Domestication, Acclimatization and Introduction; Centres of origin/diversity, components of Genetic variation; Heritability and genetic advance; Genetic basis and breeding methods in self- pollinated crops - mass and pure line selection, hybridization techniques and handling of segregating population; Multiline concept. Concepts of population genetics and Hardy-Weinberg Law, Genetic basis and methods of breeding cross pollinated crops, modes of selection; Population improvement Schemes- Ear to row method, Modified Ear to Row, recurrent selection schemes; Heterosis and inbreeding depression, development of inbred lines and hybrids, composite and synthetic varieties; Breeding methods in asexually propagated crops, clonal selection and hybridization; Maintenance of breeding records and data collection; Wide hybridization and pre-breeding; Polyploidy in relation to plant breeding, mutation breeding-methods and uses; Breeding for important biotic and abiotic stresses; Biotechnological tools-DNA markers and marker assisted selection. Participatory

Intellectual Property Rights, Plant Breeders and & Farmer's Rights.	Practical	Plant Breeder's kit, Study of germplasm of various crops. Study of floral structure of self-pollinated and cross pollinated crops. Emasculation and hybridization techniques in self & cross pollinated crops. Consequences of inbreeding on genetic structure of resulting populations. Study of male sterility system. Handling of segregation populations. Methods of calculating mean, range, variance, standard deviation, heritability. Designs used in plant breeding experiments, analysis of Randomized Block Design. To work out the mode of pollination in a given crop and extent of natural out-crossing. Prediction of performance of double cross hybrids. Plant Breeder's kit, Study of germplasm of various crops. Study of floral structure of self-pollinated and cross pollinated crops. Emasculation and hybridization techniques in self & cross pollinated crops. Consequences of inbreeding on genetic structure of resulting populations. Study of male sterility system. Handling of segregation populations. Methods of calculating mean, range, variance, standard deviation, heritability. Designs used in plant breeding experiments, analysis of Randomized Block Design. To work out the mode of pollination in a given crop and extent of natural out-crossing. Prediction of performance of double cross hybrids.	3. GPB 221 Principles of Seed Technology 3(2+1) Credit Hours	Theory	Seed and seed technology: introduction, definition and importance. Deterioration causes of
plant breeding; Intellectual Property Rights, Patenting, Plant Breeders and & Farmer's Rights.	Practical	Plant Breeder's kit, Study of germplasm of various crops. Study of floral structure of self-pollinated and cross pollinated crops. Emasculation and hybridization techniques in self & cross pollinated crops. Consequences of inbreeding on genetic structure of resulting populations. Study of male sterility system. Handling of segregation populations. Methods of calculating mean, range, variance, standard deviation, heritability. Designs used in plant breeding experiments, analysis of Randomized Block Design. To work out the mode of pollination in a given crop and extent of natural out-crossing. Prediction of performance of double cross hybrids. Plant Breeder's kit, Study of germplasm of various crops. Study of floral structure of self-pollinated and cross pollinated crops. Emasculation and hybridization techniques in self & cross pollinated crops. Consequences of inbreeding on genetic structure of resulting populations. Study of male sterility system. Handling of segregation populations. Methods of calculating mean, range, variance, standard deviation, heritability. Designs used in plant breeding experiments, analysis of Randomized Block Design. To work out the mode of pollination in a given crop and extent of natural out-crossing. Prediction of performance of double cross hybrids.	History and Development of Seed Industry in India; PPV & FR Act	Theory	Seed and seed technology: introduction, definition and importance. Deterioration causes of

<p>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.</p> <p>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.</p>		<p>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. History and Development of Seed Industry in India; PPV & FR Act. Detection of genetically modified crops, Transgene contamination in non-GM crops, GM crops and organic seed production.</p> <p>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.</p>
<p>Practical</p> <p>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</p>		<p>Practical</p> <p>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</p>

<p>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.</p>		<p>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.</p>
<p align="center">4. GPB 311 Crop Improvement –I (Kharif Crops) 2(1+1) Credit Hours</p>		
<p>Theory Centers of origin, distribution of species, wild relatives in different cereals; pulses; oilseeds; fibres; fodders and cash crops; vegetable and horticultural crops; Plant genetic resources, its utilization and conservation, study of genetics of qualitative and quantitative characters; Important concepts of breeding self pollinated, cross pollinated and vegetatively propagated crops; Major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional); Hybrid seed production technology in Maize, Rice, Sorghum, Pearl millet and Pigeonpea, etc. Ideotype concept and climate resilient crop varieties for future.</p>	<p>and applications of genetic, cytogenetics and biotechology</p>	<p>Theory Centers of origin, distribution of species, wild relatives and applications of genetic, cytogenetics and biotechology in different cereals; pulses; oilseeds; fibres; fodders and cash crops; vegetable and horticultural crops; Plant genetic resources, its utilization and conservation, study of genetics of qualitative and quantitative characters; Important concepts of breeding self pollinated, cross pollinated and vegetatively propagated crops; Major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional); Hybrid seed production technology in Maize, Rice, Sorghum, Pearl millet and Pigeonpea, etc. Ideotype concept and climate resilient crop varieties for future.</p>
<p>Practical Floral biology, emasculation and hybridization techniques in different crop species; viz., Rice, Jute, Maize, Sorghum, Pearl millet, Ragi, Pigeonpea, Urdbean, Mungbean, Soybean, Groundnut, Sesame, Caster, Cotton, Cowpea, Tobacco, Brinjal, Okra and Cucurbitaceous crops. Maintenance breeding of different kharif crops. Handling of</p>		<p>Practical Floral biology, emasculation and hybridization techniques in different crop species; viz., Rice, Jute, Maize, Sorghum, Pearl millet, Ragi, Pigeonpea, Urdbean, Mungbean, Soybean, Groundnut, Sesame, Caster, Cotton, Cowpea, Tobacco, Brinjal, Okra and Cucurbitaceous crops. Maintenance breeding of different kharif crops. Handling of</p>

germplasm and segregating populations by different methods like pedigree, bulk and single seed decent methods; Study of field techniques for seed production and hybrid seeds production in Kharif crops; Estimation of heterosis, inbreeding depression and heritability; Layout of field experiments; Study of quality characters, donor parents for different characters; Visit to seed production plots; Visit to AICRP plots of different field crops.		germplasm and segregating populations by different methods like pedigree, bulk and single seed decent methods; Study of field techniques for seed production and hybrid seeds production in Kharif crops; Estimation of heterosis, inbreeding depression and heritability; Layout of field experiments; Study of quality characters, donor parents for different characters; Visit to seed production plots; Visit to AICRP plots of different field crops.
5. GPB 321 Crop Improvement –II (Rabi Crops) 2(1+1) credit Hours		
Theory Centers of origin, distribution of species, wild relatives in different cereals; pulses; oilseeds; fodder crops and cash crops; vegetable and horticultural crops; Plant genetic resources, its utilization and conservation; study of genetics of qualitative and quantitative characters; Major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional); Hybrid seed production technology of rabi crops. Ideotype concept and climate resilient crop varieties for future.	and applications of genetic, cytogenetics and biotechchlogy	Theory Centers of origin, distribution of species, wild relatives and applications of genetic, cytogenetics and biotechchlogy in different cereals; pulses; oilseeds; fodder crops and cash crops; vegetable and horticultural crops; Plant genetic resources, its utilization and conservation; study of genetics of qualitative and quantitative characters; Major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional); Hybrid seed production technology of rabi crops. Ideotype concept and climate resilient crop varieties for future.
Practical Floral biology, emasculation and hybridization techniques in different crop species namely Wheat, Oat, Barley, Chickpea, Lentil, Field pea, Rajma, Horse gram, Rapeseed Mustard, Sunflower, Safflower, Potato, Berseem. Sugarcane, Tomato, Chilli, Onion; Handling of germplasm and segregating populations		Practical Floral biology, emasculation and hybridization techniques in different crop species namely Wheat, Oat, Barley, Chickpea, Lentil, Field pea, Rajma, Horse gram, Rapeseed Mustard, Sunflower, Safflower, Potato, Berseem. Sugarcane, Tomato, Chilli, Onion; Handling of germplasm and segregating populations

by different methods like pedigree, bulk and single seed decent methods; Study of field techniques for seed production and hybrid seeds production in Rabi crops; Estimation of heterosis, inbreeding depression and heritability; Layout of field experiments; Study of quality characters, study of donor parents for different characters; Visit to seed production plots; Visit to AICRP plots of different field crops		by different methods like pedigree, bulk and single seed decent methods; Study of field techniques for seed production and hybrid seeds production in Rabi crops; Estimation of heterosis, inbreeding depression and heritability; Layout of field experiments; Study of quality characters, study of donor parents for different characters; Visit to seed production plots; Visit to AICRP plots of different field crops
6. UGE 223 Commercial Plant Breeding 3(1+2) Credit Hours		
Theory Types of crops and modes of plant reproduction. Line development and maintenance breeding in self and cross pollinated crops (A/B/R and two line system) for development of hybrids and seed production. Genetic purity test of commercial hybrids. Advances in hybrid seed production of maize, rice, sorghum, pearl millet, castor, sunflower, cotton pigeon pea, Brassica etc. Quality seed production of vegetable crops under open and protected environment. Alternative strategies for the development of the line and cultivars: haploid inducer, tissue culture techniques and biotechnological tools. IPR issues in commercial plant breeding: DUS testing and registration of varieties under PPV & FR Act. Variety testing, release and notification systems in India. Principles and techniques of seed production, types of seeds, quality testing in self and cross pollinated crops.	An Overview on Commercial Plant Breeding.	Theory An Overview on Commercial Plant Breeding. Types of crops and modes of plant reproduction. Line development and maintenance breeding in self and cross pollinated crops (A/B/R and two line system) for development of hybrids and seed production. Genetic purity test of commercial hybrids. Advances in hybrid seed production of maize, rice, sorghum, pearl millet, castor, sunflower, cotton pigeon pea, Brassica etc. Quality seed production of vegetable crops under open and protected environment. Alternative strategies for the development of the line and cultivars: haploid inducer, tissue culture techniques and biotechnological tools. IPR issues in commercial plant breeding: DUS testing and registration of varieties under PPV & FR Act. Variety testing, release and notification systems in India. Principles and techniques of seed production, types of seeds, quality testing in self and cross pollinated crops.
Practical Floral biology in self and cross pollinated species, selfing and crossing techniques. Techniques of seed production in self and cross pollinated crops using		Practical Floral biology in self and cross pollinated species, selfing and crossing techniques. Techniques of seed production in self and cross pollinated crops using

<p>A/B/R and two line system. Learning techniques in hybrid seed production using male-sterility in field crops. Understanding the difficulties in hybrid seed production, Tools and techniques for optimizing hybrid seed production. Concept of rouging in seed production plot. Concept of line its multiplication and purification in hybrid seed production. Role of pollinators in hybrid seed production. Hybrid seed production techniques in sorghum, pearl millet, maize, rice, rapeseed-mustard, sunflower, castor, pigeon pea, cotton and vegetable crops. Sampling and analytical procedures for purity testing and detection of spurious seed. Seed drying and storage structure in quality seed management. Screening techniques during seed processing viz., grading and packaging. Visit to public private seed production and processing plants.</p>		<p>A/B/R and two line system. Learning techniques in hybrid seed production using male-sterility in field crops. Understanding the difficulties in hybrid seed production, Tools and techniques for optimizing hybrid seed production. Concept of rouging in seed production plot. Concept of line its multiplication and purification in hybrid seed production. Role of pollinators in hybrid seed production. Hybrid seed production techniques in sorghum, pearl millet, maize, rice, rapeseed-mustard, sunflower, castor, pigeon pea, cotton and vegetable crops. Sampling and analytical procedures for purity testing and detection of spurious seed. Seed drying and storage structure in quality seed management. Screening techniques during seed processing viz., grading and packaging. Visit to public private seed production and processing plants.</p>
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DEPARTMENT OF PLANT PATHOLOGY
Sardar Vallabhbhai Patel University of Agriculture &
Technology, Meerut – 250110

Dr. Kamal Khilari
Professor & HOD

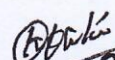
Letter No. SVP/2022/765

Dated : 25/08/2022

To,
✓ Dean Ag./ Dean PGS
SVPUA&T, Meerut

Sir,

In reference of your letter no. SVP/2022/PGS/2366 dated 17.08.2022 kindly attached
herewith revised BSMA PG ^{syllabus} for necessary action at your end.


25.8.2022
(Kamal Khilari)

Present Syllabus	Matter
<p>Plant PathologyPPA-121 Fundamentals of Plant Pathology</p> <p>Theory 4(3+1)</p> <p><i>Introduction:</i> Importance of plant diseases, scope and objectives of Plant Pathology. History of Plant Pathology with special reference to Indian work. Terms and concepts in Plant Pathology. Pathogenesis, disease triangle and tetrahedron and classification of plant diseases. Important plant pathogenic organisms, fungi, bacteria, fastidious phanerogamic parasites and nematodes with examples of diseases caused by them. Diseases and symptoms due to abiotic causes. Fungi, general characters, definition of fungus, somatic structures, types of fungal thalli, fungal tissues, modifications of thallus, reproduction (asexual and sexual). Nomenclature, Binomial system of nomenclature, rules of nomenclature, classification of fungi. Key to divisions, sub divisions, orders and classes. Bacteria and mollicutes: general morphological characters. Basic methods of classification and reproduction, Viruses. nature & properties, structure and transmission. Study of phanerogamic plant parasites. Nematodes: General morphology and reproduction, nematodes. Liberation/ dispersal and survival of plant pathogens. Role of enzymes, toxins and growth regulators in disease development. Defense mechanism in plants. Epidemiology: Factors affecting disease development. Classification and formulations of fungicides and antibiotics.</p> <p>Practical</p> <p>Acquaintance with various laboratory equipments and microscopy. Collection and preservation of disease specimen. Preparation of media, isolation and Koch's postulates. General study of different structures of fungi. Study of symptoms of various plant diseases. Study of representative fungal genera. Staining and identification of plant pathogenic bacteria. Transmission of plant viruses. Study of phanerogamic plant parasites. Study of morphological features and identification of plant parasitic nematodes. Sampling and extraction of nematodes from soil and plant material, preparation of nematode mounting. Study of fungicides and their formulations. Methods of pesticide application and their safe use. Calculation of fungicide sprays concentrations.</p>	<p>Plant PathologyPPA-121 Fundamentals of Plant Pathology</p> <p>Theory 4(3+1)</p> <p><i>Introduction:</i> Importance of plant diseases, scope and objectives of Plant Pathology. History of Plant Pathology with special reference to Indian work. Terms and concepts in Plant Pathology. Pathogenesis, disease triangle and tetrahedron and classification of plant diseases. Important plant pathogenic organisms, fungi, bacteria, fastidious phanerogamic parasites and nematodes with examples of diseases caused by them. Diseases and symptoms due to abiotic causes. Fungi, general characters, definition of fungus, somatic structures, types of fungal thalli, fungal tissues, modifications of thallus, reproduction (asexual and sexual). Nomenclature, Binomial system of nomenclature, rules of nomenclature, classification of fungi. Key to divisions, sub divisions, orders and classes. Bacteria and mollicutes: general morphological characters. Basic methods of classification and reproduction, viruses, general characteristics, properties, structure, transmission, symptoms, management and important plant viral disease. Study of phanerogamic plant parasites. Nematodes: General characteristics, morphology, reproduction, important nematodes disease and nematodes management practices. Liberation/ dispersal and survival of plant pathogens. Role of enzymes, toxins and growth regulators in disease development. Defense mechanism in plants. Epidemiology: Factors affecting disease development. Classification and formulations of fungicides and antibiotics.</p> <p>Practical</p> <p>Acquaintance with various laboratory equipments and microscopy. Collection and preservation of disease specimen. Preparation of media, isolation and Koch's postulates. General study of different structures of fungi. Study of symptoms of various plant diseases. Study of representative fungal genera. Staining and identification of plant pathogenic bacteria. Transmission of plant viruses. Study of phanerogamic plant parasites. Study of morphological features and identification of plant parasitic nematodes. Sampling and extraction of nematodes from soil and plant material, preparation of nematode mounting. Study of fungicides and their formulations. Methods of pesticide application and their safe use. Calculation of fungicide sprays concentrations.</p>
<p>PPA-211 Diseases of Field & Horticultural Crops & their Management-I</p> <p>Theory 3(2+1)</p> <p>Symptoms, etiology, disease cycle and management of major diseases of following crops: Field Crops: Rice: blast, brown spot, bacterial blight, sheath blight, false smut, khaira and tungro; Maize: stalk rots, downy mildew, Sorghum: smuts, Bajra downy mildew and ergot; Groundnut: early and late leaf spots, GNBN</p> <p>Soybean: Rhizoctonia blight, bacterial spot, and mosaic; Pigeonpea: Phytophthora blight, wilt and sterility mosaic, Cercospora leaf spot, web blight and yellow mosaic; Till: Phytophthora blight phyllody, Barley: covered smut, stripe disease; Tobacco: TMV mosaic. Horticultural Crops: Guava: wilt and anthracnose; Banana: Panama wilt, bacterial wilt, Sigatoka and bunchy top; Papaya: foot rot, leaf curl, Pomegranate:</p>	<p>PPA-211 Diseases of Field & Horticultural Crops & their Management-I</p> <p>Theory 3(2+1)</p> <p>Symptoms, etiology, disease cycle and management of major diseases of following crops: Field Crops: Rice: blast, brown spot, bacterial blight, sheath blight, false smut, bakanae, khaira and tungro; Maize: stalk rots, downy mildew, Sorghum: smuts, Bajra smut, downy mildew and ergot; Groundnut: early and late leaf spots, GNBN</p> <p>Soybean: Rhizoctonia blight, bacterial spot, and mosaic; Pigeonpea: Phytophthora blight, wilt and sterility mosaic, Cercospora leaf spot, web blight and yellow mosaic; Till: Phytophthora blight phyllody, Barley: covered smut, stripe disease; Tobacco: TMV mosaic. Horticultural Crops: Guava: wilt and anthracnose; Banana: Panama wilt, bacterial wilt, Sigatoka and bunchy top; Papaya: foot rot, leaf curl, Pomegranate: bacterial blight,</p>

<p>bacterial blight, Cruciferous vegetables: Alternaria leaf spot and black rot, Brinjal: Phomopsis blight and fruit rot and Sclerotinia blight; Tomato: early and late blight, buck eye rot and leaf curl and mosaic; Okra: Yellow Vein Mosaic; Beans: anthracnose and bacterial blight; Ginger: soft rot; Colocasia: Phytophthora blight, Coconut: wilt and bud rot, Tea: blister blight; Coffee: rust</p> <p>Practical</p> <p>Identification and histopathological studies of selected diseases of field and horticultural crops covered in theory. Field visit for the diagnosis of field problems. Collection and preservation of plant diseased specimens for Herbarium; Note: Students should submit 50 pressed and well-mounted specimens.</p>	<p>Cruciferous vegetables: Alternaria leaf spot and black rot, Brinjal: Phomopsis blight and fruit rot and Sclerotinia blight; Tomato: early and late blight, buck eye rot and leaf curl and mosaic; Okra: Yellow Vein Mosaic; Beans: anthracnose and bacterial blight; Ginger: soft rot; Colocasia: Phytophthora blight, Coconut: wilt and bud rot, Tea: blister blight; Coffee: rust</p> <p>Practical</p> <p>Identification and histopathological studies of selected diseases of field and horticultural crops covered in theory. Field visit for the diagnosis of field problems. Collection and preservation of plant diseased specimens for Herbarium; Note: Students should submit 50 pressed and well-mounted specimens.</p>
<p>PPA-312 Principles of Integrated Pest and Disease Management 3(2+1)</p> <p>Theory</p> <p>Categories of insect pests and diseases, IPM: Introduction, history, importance, concepts, principles and tools of IPM. Economic importance of insect pests, diseases and pest risk analysis. Methods of detection and diagnosis of insect pest and diseases. Calculation and dynamics of economic injury level and importance of Economic threshold level. Methods of control: Host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control. Ecological management of crop environment. Introduction to conventional pesticides for the insect pests and disease management. Survey surveillance and forecasting of Insect pest and diseases. Development and validation of IPM module. Implementation and impact of IPM (IPM module for Insect pest and disease. Safety issues in pesticide uses. Political, social and legal implication of IPM. Case histories of important IPM programmes.</p> <p>Practical</p> <p>Methods of diagnosis and detection of various insect pests, and plant diseases, Methods of insect pests and plant disease measurement, Assessment of crop yield losses, calculations based on economics of IPM, Identification of biocontrol agents, different predators and natural enemies. Mass multiplication of Trichoderma, Pseudomonas, Trichogramma, NPV etc. Identification and nature of damage of important insect pests and diseases and their management. Crop (agro-ecosystem) dynamics of a selected insect pest and diseases. Plan & assess preventive strategies (IPM module) and decision making. crop monitoring attacked by insect, pest and diseases. Awareness campaign at farmers fields.</p>	<p>PPA/ENT-312 Principles of Integrated Pest and Disease Management 3(2+1)</p> <p>Theory</p> <p>Categories of insect pests and diseases, IPM: Introduction, history, importance, concepts, principles and tools of IPM. Economic importance of insect pests, diseases and pest risk analysis. Methods of detection and diagnosis of insect pest and diseases. Calculation and dynamics of economic injury level and importance of Economic threshold level. Methods of control: Host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control. Ecological management of crop environment. Introduction to conventional pesticides for the insect pests and disease management. Survey surveillance and forecasting of Insect pest and diseases. Development and validation of IPM module. Implementation and impact of IPM (IPM module for Insect pest and disease). Safety issues in pesticide uses. Political, social and legal implication of IPM. Case histories of important IPM programmes.</p> <p>Practical</p> <p>Methods of diagnosis and detection of various insect pests, and plant diseases, Methods of insect pests and plant disease measurement, Assessment of crop yield losses, calculations based on economics of IPM, Identification of biocontrol agents, different predators and natural enemies. Mass multiplication of Trichoderma, Pseudomonas, Trichogramma, <u>Metarhizium</u>, NPV etc. Identification and nature of damage of important insect pests and diseases and their management. Crop (agro-ecosystem) dynamics of a selected insect pest and diseases. Plan & assess preventive strategies (IPM module) and decision making. Crop monitoring attacked by insect, pest and diseases. Awareness campaign at farmers fields.</p>
<p>PPA-321 Diseases of Field & Horticultural Crops & their Management-II 3(2+1)</p> <p>Theory</p> <p>Symptoms, etiology, disease cycle and management of following diseases:</p> <p>Field Crops:</p> <p>Wheat: rusts, loose smut, karnal bunt, powdery mildew, alternaria blight, and ear cockle; Sugarcane: red rot, smut, wilt, grassy shoot, Sunflower Sclerotinia stem rot and Alternaria blight; Mustard: Alternaria blight, white rust, downy mildew and Sclerotinia stem rot; Gram: wilt, grey mould and Ascochyta blight, Lentil: rust and wilt, Cotton: vascular wilt, and black arm; Pea: downy mildew, powdery mildew and rust.</p>	<p>PPA-321 Diseases of Field & Horticultural Crops & their Management-II 3(2+1)</p> <p>Theory</p> <p>Symptoms, etiology, disease cycle and management of following diseases:</p> <p>Field Crops:</p> <p>Wheat: rusts, loose smut, karnal bunt, powdery mildew, alternaria blight, and ear cockle; Sugarcane: red rot, smut, wilt, <u>pokkahboeng</u> grassy shoot, Sunflower Sclerotinia stem rot and Alternaria blight; Mustard: Alternaria blight, white rust, downy mildew and Sclerotinia stem rot; Gram: wilt, grey mould and Ascochyta blight, Lentil: rust and wilt, Cotton: vascular wilt, and black arm; Pea: downy mildew, powdery mildew and rust.</p>

Horticultural Crops:

Mango: anthracnose, malformation, bacterial blight and powdery mildew; Citrus: canker and gummosis; Grape vine: downy mildew, Powdery mildew and anthracnose; Apple: scab, fire blight, Peach: leaf curl. Strawberry: leaf spot Potato: early and late blight, black scurf, leaf roll, Cucurbits: downy mildew, powdery mildew, wilt, Onion and garlic: purple blotch, and Stemphylium blight Chillies: anthracnose and fruit rot, leaf curl, Turmeric: leaf spot Coriander: stem gall Marigold: Botrytis blight. Rose: dieback, powdery mildew and black leaf spot.

Practical

Identification and histopathological studies of selected diseases of field and horticultural crops covered in theory. Field visit for the diagnosis of field problems. Collection and preservation of plant diseased specimens for herbarium.

Horticultural Crops:

Mango: anthracnose, malformation, bacterial blight and powdery mildew, **red rust**; Citrus: canker and gummosis; Grape vine: downy mildew, Powdery mildew and anthracnose; Apple: scab, fire blight, Peach: leaf curl. Strawberry: leaf spot Potato: early and late blight, black scurf, leaf roll, Cucurbits: downy mildew, powdery mildew, wilt, Onion and garlic: purple blotch, and Stemphylium blight Chillies: anthracnose and fruit rot, leaf curl, Turmeric: leaf spot Coriander: stem gall Marigold: Botrytis blight. Rose: dieback, powdery mildew and black leaf spot.

Practical

Identification and histopathological studies of selected diseases of field and horticultural crops covered in theory. Field visit for the diagnosis of field problems. Collection and preservation of plant diseased specimens for herbarium.

M.Sc.

Present Syllabus	Modified Syllabus
<p>1 Mycology Course Code : PL PATH 501 Credit Hours : 2+1 Theory Unit I Introduction, definition of different terms, basic concepts. Importance of mycology in agriculture, relation of fungi to human affairs. History of mycology. Importance of culture collection and herbarium of fungi. Somatic characters and reproduction in fungi. Modern concept of nomenclature and classification, Classification of kingdom fungi: Stramenopila and Protists.</p> <p>Unit II The general characteristics of protists and life cycle in the Phyla Plasmodiophoromycota, Dictyosteliomycota, Acrasiomycota and Myxomycota. Kingdom Stramenopila: characters and life cycles of respective genera under Hypochytridiomycota, Oomycota and Labyrinthulomycota.</p> <p>Unit III Kingdom fungi: General characters, ultrastructure and life cycle patterns in representative genera under Chytridiomycota, Zygomycota, Ascomycota; Archiascomycetes, Ascomycetous yeasts, Pyrenomycetes, Plectomycetes, Discomycetes, Loculoascomycetes, Erysiphales and anamorphs of ascomycetous fungi.</p> <p>Unit IV Basidiomycota; general characters, mode of reproduction, types of basidiocarps and economic importance of Hymenomycetes. Uridinales and Ustilaginales; variability, host specificity and life cycle pattern in rusts and smuts. Mitosporic fungi; status of asexual fungi, their teliomorphic relationships, Molecular characterization of plant pathogenic fungi.</p> <p>Practical</p> <ul style="list-style-type: none"> Detailed comparative study of different groups of fungi; Collection of cultures and live specimens; Saccardoan classification and classification based on conidiogenesis; Vegetative structures and different types of fruiting bodies produced by slime molds, stramenopiles and true fungi; Myxomycotina: Fructification, plasmodiocarp, sporangia, plasmodium and aethalia. Oomycota; Somatic and reproductive structures of <i>Pythium</i>, <i>Phytophthora</i>, downy mildews and <i>Albugo</i>, Zygomycetes: Sexual and asexual structures of <i>Mucor</i>, <i>Rhizopus</i>, General characters of VAM fungi. Ascomycetes; fruiting structures, Erysiphales, and Eurotiales; General identification characters of Pyrenomycetes, Discomycetes, Loculo- ascomycetes and Laboulbenio-mycetes, Basidiomycetes; characters, ultrastructures and life cycle patterns in Ustilaginomycetes and Telionomycetes, Deuteromycetes; Characters of Hyphomycetes and Coelomycetes and their teliomorphic and anamorphic states, Collection, preservation, culturing and identification of plant parasitic fungi; Application of molecular approaches and techniques for identification of fungal pathogens. 	<p>1 Mycology Course Code : PL PATH 501 Credit Hours : 2+1 Theory Unit I Introduction, definition of different terms, basic concepts. Importance of mycology in agriculture, relation of fungi to human affairs. History of mycology. Importance of culture collection and herbarium of fungi. Somatic characters and reproduction in fungi. Modern concept of nomenclature and classification, Classification of kingdom fungi: Stramenopila and Protists.</p> <p>Unit II The general characteristics of protists and life cycle in the Phyla Plasmodiophoromycota, Dictyosteliomycota, Acrasiomycota and Myxomycota. Kingdom Stramenopila: characters and life cycles of respective genera under Hypochytridiomycota, Oomycota and Labyrinthulomycota.</p> <p>Unit III Kingdom fungi: General characters, ultrastructure and life cycle patterns in representative genera under Chytridiomycota, Zygomycota, Ascomycota; Archiascomycetes, Ascomycetous yeasts, Pyrenomycetes, Plectomycetes, Discomycetes, Loculoascomycetes, Erysiphales and anamorphs of ascomycetous fungi.</p> <p>Unit IV Basidiomycota; general characters, mode of reproduction, types of basidiocarps and economic importance of Hymenomycetes. Uridinales and Ustilaginales; variability, host specificity and life cycle pattern in rusts and smuts. Mitosporic fungi; status of asexual fungi, their teliomorphic relationships, <u>Introduction to Edible & Medicinal Fungi</u> Molecular characterization of plant pathogenic fungi.</p> <p>Practical</p> <ul style="list-style-type: none"> Detailed comparative study of different groups of fungi; Collection of cultures and live specimens; Saccardoan classification and classification based on conidiogenesis; Vegetative structures and different types of fruiting bodies produced by slime molds, stramenopiles and true fungi; Myxomycotina: Fructification, plasmodiocarp, sporangia, plasmodium and aethalia. Oomycota; Somatic and reproductive structures of <i>Pythium</i>, <i>Phytophthora</i>, downy mildews and <i>Albugo</i>, Zygomycetes: Sexual and asexual structures of <i>Mucor</i>, <i>Rhizopus</i>, General characters of VAM fungi. Ascomycetes; fruiting structures, Erysiphales, and Eurotiales; General identification characters of Pyrenomycetes, Discomycetes, Loculo- ascomycetes and Laboulbenio-mycetes, Basidiomycetes; characters, ultrastructures and life cycle patterns in Ustilaginomycetes and Telionomycetes, Deuteromycetes; Characters of Hyphomycetes and Coelomycetes and their teliomorphic and anamorphic states, Collection, preservation, culturing and identification of plant parasitic fungi; Application of molecular approaches and techniques for identification of fungal pathogens. <u>Production Technology of Edible & Medicinal Fungi</u>
<p>2 Plant Virology Course Code : PL PATH 502 Credit Hours : 2+1 Theory Unit I History and economic significances of plant viruses. General and morphological characters, composition and structure of viruses. Myco- viruses, arbo and baculo viruses, satellite viruses, satellite RNAs, phages, viroids and prions. Origin and evolution of viruses and their nomenclature and classification.</p> <p>Unit II Genome organization, replication in selected groups of plant viruses and their movement in host. Response of the host to virus infection: biochemical, physiological, and symptomatic changes. Transmission of viruses and virus-vector relationship. Isolation and purification of viruses.</p> <p>Unit III Detection and identification of plant viruses by using protein and nucleic acid based diagnostic techniques. Natural (R-genes) and engineering resistance to plant viruses.</p> <p>Unit IV</p>	<p>2 Plant Virology Course Code : PL PATH 502 Credit Hours : 2+1 Theory Unit I History and economic significances of plant viruses. General and morphological characters, composition and structure of viruses, satellite viruses, satellite RNAs, phages, viroids. Origin and evolution of viruses and their nomenclature and classification.</p> <p>Unit II Genome organization, replication and movement in host. Response of the host to virus infection: biochemical, physiological, and symptomatic changes. Transmission of viruses and virus-vector relationship. Isolation and purification of viruses.</p> <p>Unit III Detection and identification of plant viruses by using protein and nucleic acid based diagnostic techniques. Natural (R-genes) and engineering resistance to plant viruses.</p> <p>Unit IV Virus epidemiology and ecology (spread of plant viruses in fields, host</p>

<p>Virus epidemiology and ecology (spread of plant viruses in fields, host range and survival). Management of diseases caused by plant viruses.</p> <ul style="list-style-type: none"> • Study of symptoms caused by plant viruses (followed by field visit); • Isolation and biological purification of plant virus cultures; • Bioassay of virus cultures on indicator plants and host differentials; • Transmission of plant viruses (Mechanical, graft and vector and study of disease development); • Plant virus purification (clarification, concentration, centrifugation, high resolution separation and analysis of virions), Electron microscopy for studying viral particlemorphology; • Antisera production, Detection and diagnosis of plant viruses with serological (ELISA), nucleic acid (Non-PCR–LAMP, Later flow micro array and PCR based techniques); • Exposure to basic bio-informatic tools for viral genome analysis and their utilization in developing detection protocols and population studies (BLASTn tool, Primer designing software, Bioedit tool, Clustal X/W, MEGA Software). 	<p>range and survival). Management of diseases caused by plant viruses.</p> <ul style="list-style-type: none"> • Study of symptoms caused by plant viruses (followed by field visit); • Isolation and biological purification of plant virus cultures; • Bioassay of virus cultures on indicator plants and host differentials; • Transmission of plant viruses (Mechanical, graft and vector and study of disease development); • Plant virus purification (clarification, concentration, centrifugation, high resolution separation and analysis of virions), Electron microscopy for studying viral particlemorphology; • Antisera production, Detection and diagnosis of plant viruses with serological (ELISA), nucleic acid (Non-PCR–LAMP, Later flow micro array and PCR based techniques);
<p>3 Plant Pathogenic Prokaryotes Course Code : PL PATH 503 Credit Hours : 2+1 Theory Unit I Prokaryotic cell: History and development of Plant bacteriology, history of plant bacteriology in India. Evolution of prokaryotic life, Prokaryotic cytoskeletal proteins. Structure of bacterial cell. Structure and composition of gram negative and gram positive cell wall; synthesis of peptidoglycan; Surface proteins; Lipopolysaccharide structure; Membrane transport; fimbriae and pili (Type IV pili); Mechanism of flagellar rotatory motor and locomotion, and bacterial movement; Glycocalyx (S- layer; capsule); the bacterial chromosomes and plasmids; Operon and other structures in cytoplasm; Morphological feature of fastidious bacteria, spiroplasmas and Phytoplasmas. Unit II Growth and nutritional requirements. Infection mechanism, role of virulence factors in expression of symptoms. Survival and dispersal of phytopathogenic prokaryotes. Unit III Taxonomy of phytopathogenic prokaryotes: Taxonomic ranks hierarchy; Identification, Classification and nomenclature of bacteria, phytoplasma and spiroplasma. The codes of Nomenclature and characteristics. Biochemical and molecular characterization of phytopathogenic prokaryotes. Unit IV Variability among phytopathogenic prokaryotes: general mechanism of variability (mutation); specialized mechanisms of variability (sexual like process in bacteria- conjugation; transformation; transduction); and horizontal gene transfer. Unit V Bacteriophages, L form of bacteria, plasmids and bdellovibrios: Structure; Infection of host cells; phage multiplication cycle; Classification of phages, Use of phages in plant pathology/ bacteriology, Lysogenic conversion; H Plasmids and their types, plasmid borne phenotypes. Introduction to bacteriocins. Strategies for management of diseases caused by phytopathogenic prokaryotes. Practical <ul style="list-style-type: none"> • Study of symptoms produced by phytopathogenic prokaryotes; Isolation, enumeration, purification, identification and host inoculation of phytopathogenic bacteria; • Stains and staining methods; • Biochemical and serological characterization; • Isolation of genomic DNA plasmid; • Use of antibacterial chemicals/ antibiotics; • Isolation of fluorescent <i>Pseudomonas</i>; • Preservation of bacterial cultures; • Identification of prokaryotic organisms by using 16S rDNA, and other gene sequences; • Diagnosis and management of important diseases caused by bacteria and mollicutes. </p>	<p>3 Plant Pathogenic Prokaryotes Course Code : PL PATH 503 Credit Hours : 2+1 Theory Unit I Prokaryotic cell: History and development of Plant bacteriology, history of plant bacteriology in India. Evolution of prokaryotic life, Prokaryotic cytoskeletal proteins. Structure of bacterial cell. Structure and composition of gram negative and gram positive cell wall; synthesis of peptidoglycan; Surface proteins; Lipopolysaccharide structure; Membrane transport; fimbriae and pili (Type IV pili); Mechanism of flagellar rotatory motor and locomotion, and bacterial movement; Glycocalyx (S- layer; capsule); the bacterial chromosomes and plasmids; Operon and other structures in cytoplasm; Morphological feature of fastidious bacteria, spiroplasmas and Phytoplasmas. Unit II Growth and nutritional requirements. Infection mechanism, role of virulence factors in expression of symptoms. Survival and dispersal of phytopathogenic prokaryotes. Unit III Taxonomy of phytopathogenic prokaryotes: Taxonomic ranks hierarchy; Identification, Classification and nomenclature of bacteria, phytoplasma and spiroplasma. The codes of Nomenclature and characteristics. Biochemical and molecular characterization of phytopathogenic prokaryotes. Unit IV Variability among phytopathogenic prokaryotes: general mechanism of variability (mutation); specialized mechanisms of variability (sexual like process in bacteria- conjugation; transformation; transduction); and horizontal gene transfer. Unit V Bacteriophages, L form of bacteria, plasmids and bdellovibrios: Structure; Infection of host cells; phage multiplication cycle; Classification of phages, Use of phages in plant pathology/ bacteriology, Lysogenic conversion; H Plasmids and their types, plasmid borne phenotypes. Introduction to bacteriocins. Strategies for management of diseases caused by phytopathogenic prokaryotes. Practical <ul style="list-style-type: none"> • Study of symptoms produced by phytopathogenic prokaryotes; Isolation, enumeration, purification, identification and host inoculation of phytopathogenic bacteria; • Stains and staining methods; • Biochemical and serological characterization; • Isolation of genomic DNA plasmid; • Use of antibacterial chemicals/ antibiotics; • Isolation of fluorescent <i>Pseudomonas</i>; • Preservation of bacterial cultures; • Identification of prokaryotic organisms by using 16S rDNA, and other gene sequences; • Diagnosis and management of important diseases caused by bacteria and mollicutes. </p>
<p>4 Plant Nematology Course Code : PL PATH 504 Credit Hours : 2+1 Theory Unit I Characteristics of Phylum Nematoda and its relationship with other related</p>	<p>4 Plant Nematology Course Code : PL PATH 504 Credit Hours : 2+1 Theory Unit I Characteristics of Phylum Nematoda and its relationship with other</p>

<p>phyla, history and growth of Nematology; nematode habitats and diversity- plant, animal and human parasites; useful nematodes; economic importance of nematodes to agriculture, horticulture and forestry.</p> <p>Unit II Gross morphology of plant parasitic nematodes; broad classification, nematodebiology, physiology and ecology.</p> <p>Unit III Types of parasitism; nature of damage and general symptomatology; interaction of plant-parasitic nematodes with other organisms.</p> <p>Unit IV Plant nematode relationships, cellular responses to infection by important phytonematodes; physiological specialization among phytonematodes.</p> <p>Unit V Principles and practices of nematode management; integrated nematode management.</p> <p>Unit VI Emerging nematode problems, Importance of nematodes in international trade and quarantine.</p> <p>Practical</p> <ul style="list-style-type: none"> • Studies on kinds of nematodes- free-living, animal, insect and plant parasites; • Nematode extraction from soil; • Extraction of migratory endoparasites, staining for sedentary endoparasites; • Examination of different life stages of important plant parasitic nematodes, their symptoms and histopathology. 	<p>related phyla, history and growth of Nematology; nematode habitats and diversity- plant, animal and human parasites; useful nematodes; economic importance of nematodes to agriculture, horticulture and forestry.</p> <p>Unit II Gross morphology of plant parasitic nematodes; broad classification, nematodebiology, physiology and ecology.</p> <p>Unit III Types of parasitism; nature of damage and general symptomatology; interaction of plant-parasitic nematodes with other organisms.</p> <p>Unit IV Plant nematode relationships, cellular responses to infection by important phytonematodes; physiological specialization among phytonematodes.</p> <p>Unit V Principles and practices of nematode management; integrated nematode management.</p> <p>Unit VI Emerging nematode problems, Importance of nematodes in international trade and quarantine.</p> <p>Practical</p> <ul style="list-style-type: none"> • Studies on kinds of nematodes- free-living, animal, insect and plant parasites; • Nematode extraction from soil; • Extraction of migratory endoparasites, staining for sedentary endoparasites; • Examination of different life stages of important plant parasitic nematodes, their symptoms and histopathology.
<p>5 Principles of Plant Pathology Course Code : PL PATH 505 Credit Hours : 2+1</p> <p>Theory</p> <p>Unit I Importance, definitions and concepts of plant diseases, history and growth of plant pathology, biotic and abiotic causes of plant diseases.</p> <p>Unit II Growth, reproduction, survival and dispersal of important plant pathogens, role of environment and host nutrition on disease development.</p> <p>Unit III Host parasite interaction, recognition concept and infection, symptomatology, disease development- role of enzymes, toxins, growth regulators; defense strategies- oxidative burst; Phenolics, Phytoalexins, PR proteins, Elicitors. Altered plant metabolism as affected by plant pathogens.</p> <p>Unit IV Genetics of resistance; 'R' genes; mechanism of genetic variation in pathogens; molecular basis for resistance; marker-assisted selection; genetic engineering for disease resistance.</p> <p>Practical</p> <ul style="list-style-type: none"> • Basic plant pathological techniques; • Isolation, inoculation and purification of plant pathogens and proving Koch's postulates; • Techniques to study variability in different plant pathogens; • Purification of enzymes, toxins and their bioassay; • Estimation of growth regulators, phenols, phytoalexins in resistant and susceptible plants. 	<p>5 Principles of Plant Pathology Course Code : PL PATH 505 Credit Hours : 2+1</p> <p>Theory</p> <p>Unit I Importance, definitions and concepts of plant diseases, history and growth of plant pathology, biotic and abiotic causes of plant diseases.</p> <p>Unit II Growth, reproduction, survival and dispersal of important plant pathogens, role of environment and host nutrition on disease development.</p> <p>Unit III Host parasite interaction, recognition concept and infection, symptomatology, disease development- role of enzymes, toxins, growth regulators; defense strategies- oxidative burst; Phenolics, Phytoalexins, PR proteins, Elicitors. Altered plant metabolism as affected by plant pathogens.</p> <p>Unit IV Genetics of resistance; 'R' genes; mechanism of genetic variation in pathogens; molecular basis for resistance; marker-assisted selection; genetic engineering for disease resistance.</p>
<p>6 Techniques for Detection and Diagnosis of Plant Diseases Course Code : PL PATH 506 Credit Hours : 0+2</p> <p>Practical</p> <ul style="list-style-type: none"> • Detection of plant pathogens 1. Based on visual symptoms, 2. Biochemical test 3. Using microscopic techniques, 4. Cultural studies; (use of selective media to isolate pathogens). 5. Biological assays (indicator hosts, differential hosts) 6. Serological assays 7. Nucleic acid based techniques (Non-PCR-LAMP, Later flow microarray and PCR based- multiplex, nested, qPCR, immune capture PCR, etc.); • Phenotypic and genotypic tests for identification of plant pathogens; • Molecular identification (16S rDNA and 16S-23S rDNA intergenic spacer region sequences-prokaryotic organisms; and eukaryotic organism by ITS region) and whole genome sequencing; • Volatile compounds profiling by using GC-MS and LC-MS; • FAME analysis, Fluorescence <i>in-situ</i> Hybridization (FISH), Flow Cytometry, Phage display technique, biosensors for detection of plant pathogens; 	<p>6 Techniques for Detection and Diagnosis of Plant Diseases Course Code : PL PATH 506 Credit Hours : 0+2</p> <p>Practical</p> <ul style="list-style-type: none"> • Detection of plant pathogens 1. Based on visual symptoms, 2. Biochemical test 3. Using microscopic techniques, 4. Cultural studies; (use of selective media to isolate pathogens). 5. Biological assays (indicator hosts, differential hosts) 6. Serological assays 7. Nucleic acid based techniques (Non-PCR-LAMP, Later flow microarray and PCR based- multiplex, nested, qPCR, immune capture PCR, etc.); • Phenotypic and genotypic tests for identification of plant pathogens; • Molecular identification (16S rDNA and 16S-23S rDNA intergenic spacer region sequences-prokaryotic organisms; and eukaryotic organism by ITS region) and whole genome sequencing; • Volatile compounds profiling by using GC-MS and LC-MS; • FAME analysis, Fluorescence <i>in-situ</i> Hybridization (FISH), Flow Cytometry, Phage display technique, biosensors for detection of plant pathogens;

<ul style="list-style-type: none"> Genotypic tools such as genome/ specific gene sequence homology comparison by BLAST (NCBI and EMBL) and electron microscopy techniques of plant virus detection and diagnosis. 	<ul style="list-style-type: none"> Genotypic tools such as genome/ specific gene sequence homology comparison by BLAST (NCBI and EMBL) and electron microscopy techniques of plant virus detection and diagnosis.
<p>7 Principles of Plant Disease Management Course Code : PL PATH 507 Credit Hours : 2+1 Theory Unit I Principles of plant disease management by cultural, physical, biological, chemical, organic amendments and botanicals methods of plant disease control, integrated control measures of plant diseases. Disease resistance and molecular approach for disease management.</p> <p>Unit II History of fungicides, bactericides, antibiotics, concepts of pathogen, immobilization, chemical protection and chemotherapy, nature, properties and mode of action of antifungal, antibacterial and antiviral chemicals. Label claim of fungicides.</p> <p>Unit III Application of chemicals on foliage, seed and soil, role of stickers, spreaders and other adjuvants, health <i>vis-a-vis</i> environmental hazards, residual effects and safety measures</p> <p>Practical</p> <ul style="list-style-type: none"> Phytopathometry; Methods of <i>in-vitro</i> evaluation of chemicals, antibiotics, bio agents against plant pathogens; Field evaluation of chemicals, antibiotics, bio agents against plant pathogens; Soil solarisation, methods of soil fumigation under protected cultivation; Methods of application of chemicals and bio control agents; ED and MIC values, study of structural details of sprayers and dusters; Artificial epiphytotic and screening of resistance. 	<p>7 Principles of Plant Disease Management Course Code : PL PATH 507 Credit Hours : 2+1 Theory Unit I Principles of plant disease management by cultural, physical, biological, chemical, organic amendments and botanicals methods of plant disease control, integrated control measures of plant diseases. Disease resistance and molecular approach for disease management.</p> <p>Unit II History of antipathogenic chemicals, concepts of pathogen, immobilization, chemical protection and chemotherapy, nature, properties and mode of action of antipathogenic chemicals. Label claim of fungicides.</p> <p>Unit III Application of chemicals on foliage, seed and soil, role of stickers, spreaders and other adjuvants, health <i>vis-a-vis</i> environmental hazards, residual effects and safety measures</p> <p>Practical</p> <ul style="list-style-type: none"> Phytopathometry; Methods of <i>in-vitro</i> evaluation of antipathogenic chemicals, plant pathogens; Field evaluation of antipathogenic chemicals, bio agents against plant pathogens; Soil solarisation, methods of soil fumigation under protected cultivation; Methods of application of chemicals and bio control agents; ED and MIC values, study of structural details of sprayers and dusters; Artificial epiphytotic and screening of resistance.
<p>8 Epidemiology and Forecasting of Plant Diseases Course Code : PL PATH 508 Credit Hours : 1+0 Theory Unit I Epidemic concepts, simple interest and compound interest disease, historical development. Elements of epidemics and their interaction. Structures and patterns of epidemics. Modelling, system approaches and expert systems in plant pathology.</p> <p>Unit II Genetics of epidemics. Models for development of plant disease epidemics. Common and natural logarithms, function fitting, area under disease progress curve and correction factors, inoculum dynamics. Population biology of pathogens, temporal and spatial variability in plant pathogens.</p> <p>Unit III Epidemiological basis of disease management. Survey, surveillance and vigilance. Remote sensing techniques and image analysis. Crop loss assessment.</p> <p>Unit IV Principles and pre-requisites of forecasting, systems and factors affecting various components of forecasting, some early forecasting and procedures based on weather and inoculum potential, modelling disease growth and disease prediction. Salient features of important forecasting models.</p>	<p>8 Epidemiology and Forecasting of Plant Diseases Course Code : PL PATH 508 Credit Hours : 1+0 Theory Unit I Epidemic concepts, simple interest and compound interest disease, historical development. Elements of epidemics and their interaction. Structures and patterns of epidemics. Modelling, system approaches and expert systems in plant pathology.</p> <p>Unit II Genetics of epidemics. Models for development of plant disease epidemics. Common and natural logarithms, function fitting, area under disease progress curve and correction factors, inoculum dynamics. Population biology of pathogens, temporal and spatial variability in plant pathogens.</p> <p>Unit III Epidemiological basis of disease management. Survey, surveillance and vigilance. Remote sensing techniques and image analysis. Crop loss assessment.</p> <p>Unit IV Principles and pre-requisites of forecasting, systems and factors affecting various components of forecasting, some early forecasting and procedures based on weather and inoculum potential, modelling disease growth and disease prediction. Salient features of important forecasting models.</p>
<p>9 Disease Resistance in Plants Course Code : PL PATH 509 Credit Hours : 2+0 Theory Unit I Introduction and historical development, dynamics of pathogenicity, process of infection, variability in plant pathogens, gene centres as sources of resistance, disease resistance terminologies. Disease escape, non-host resistance and disease tolerance.</p> <p>Unit II Genetic basis of disease resistance, types of resistance, identification of physiological races of pathogen, disease progression in relation to resistance, stabilizing selection pressure in plant pathogens.</p> <p>Unit III Host defence system, morphological and anatomical resistance, pre-formed chemicals in host defence, post infectious chemicals in host defence, phytoalexins.</p>	<p>9 Disease Resistance in Plants Course Code : PL PATH 509 Credit Hours : 2+0 Theory Unit I Introduction and historical development, dynamics of pathogenicity, process of infection, variability in plant pathogens, gene centres as sources of resistance, disease resistance terminologies. Disease escape, non-host resistance and disease tolerance.</p> <p>Unit II Genetic basis of disease resistance, types of resistance, identification of physiological races of pathogen, disease progression in relation to resistance, stabilizing selection pressure in plant pathogens.</p> <p>Unit III Host defence system, morphological and anatomical resistance, pre-formed chemicals in host defence, post infectious chemicals in host defence, phytoalexins.</p>

<p>hypersensitivity and its mechanisms. Genetic basis of relationships between pathogen and host, Gene-for-gene concept, protein-for-protein and immunization basis, management of resistance genes. Strategies for gene deployment.</p>	<p>hypersensitivity and its mechanisms. Genetic basis of relationships between pathogen and host, Gene-for-gene concept, protein-for-protein and immunization basis, management of resistance genes. Strategies for gene deployment.</p>
<p>10 Ecology of Soil Borne Plant Pathogens Course Code : PL PATH 510 Credit Hours : 1+1 Theory Unit I Soil as an environment for plant pathogens, nature and importance of rhizosphere and rhizoplane, host exudates, soil and root inhabiting fungi. Interaction of microorganisms. Unit II Types of biocontrol agents. Inoculum potential and density in relation to host and soil variables, competition, predation, antibiosis and fungistasis. Conducive and suppressive soils. Unit III Biological control- concepts and potentialities for managing soil borne pathogens. Potential of <i>Trichoderma</i> and fluorescent <i>Pseudomonas</i> in managing plant diseases. Practical</p> <ul style="list-style-type: none"> Quantification of rhizosphere and rhizoplane microflora with special emphasis on pathogens; Pathogenicity test by soil and root inoculation techniques, correlation between inoculum density of test pathogens and disease incidence, demonstration of fungistasis in natural soils; Suppression of test soil-borne pathogens by antagonistic microorganisms; Isolation and identification of different biocontrol agents; Study of various plant morphological structures associated with resistance, testing the effect of root exudates and extracts on spore germination and growth of plant pathogens; Estimating the phenolic substances, total reducing sugars in susceptible and resistant plants; Estimating the rhizosphere and root tissue population of microorganisms (pathogens) in plants. 	<p>10 Ecology of Soil Borne Plant Pathogens Course Code : PL PATH 510 Credit Hours : 1+1 Theory Unit I Soil as an environment for plant pathogens, nature and importance of rhizosphere and rhizoplane, host exudates, soil and root inhabiting fungi. Interaction of microorganisms. Unit II Types of biocontrol agents. Inoculum potential and density in relation to host and soil variables, competition, predation, antibiosis and fungistasis. Conducive and suppressive soils. Unit III Biological control- concepts and potentialities for managing soil borne pathogens. Potential of <i>Trichoderma</i> and fluorescent <i>Pseudomonas</i> in managing plant diseases. Practical</p> <ul style="list-style-type: none"> Quantification of rhizosphere and rhizoplane microflora with special emphasis on pathogens; Pathogenicity test by soil and root inoculation techniques, correlation between inoculum density of test pathogens and disease incidence, demonstration of fungistasis in natural soils; Suppression of test soil-borne pathogens by antagonistic microorganisms; Isolation and identification of different biocontrol agents; Study of various plant morphological structures associated with resistance, testing the effect of root exudates and extracts on spore germination and growth of plant pathogens; Estimating the phenolic substances, total reducing sugars in susceptible and resistant plants; Estimating the rhizosphere and root tissue population of microorganisms (pathogens) in plants.
<p>11 Chemicals and Botanicals in Plant Disease Management Course Code : PL PATH 511 Credit Hours : 2+1 Theory Unit I History and development of chemicals; definition of pesticides and related terms; advantages and disadvantages of chemicals and botanicals. Unit II Classification of chemicals used in plant disease management and their characteristics. Unit III Chemicals in plant disease control, viz., fungicides, bactericides, nematocides, antiviral chemicals and botanicals. Issues related to label claim. Unit IV Formulations, mode of action and application of different fungicides; chemotherapy and phytotoxicity of fungicides. Unit V Handling, storage and precautions to be taken while using fungicides; compatibility with other agrochemicals, persistence, cost-benefit ratio, factor affecting fungicides. New generation fungicides and composite formulations of pesticides. Unit VI Efficacy of different botanicals used and their mode of action. Important botanicals used against diseases. General account of plant protection appliances; environmental pollution, residues and health hazards, fungicidal resistance in plant pathogens and its management. Practicals</p> <ul style="list-style-type: none"> Acquaintance with formulation of different fungicides and plant protection appliances; Formulation of fungicides, bactericides and nematocides; <i>In-vitro</i> evaluation techniques, preparation of different concentrations of chemicals including botanical pesticides against pathogens; Persistence, compatibility with other agro-chemicals; 	<p>11 Chemicals and Botanicals in Plant Disease Management Course Code : PL PATH 511 Credit Hours : 2+1 Theory Unit I History and development of chemicals; definition of pesticides and related terms; advantages and disadvantages of chemicals and botanicals. Unit II Classification of chemicals used in plant disease management and their characteristics. Unit III Chemicals in plant disease control, viz., fungicides, bactericides, nematocides, antiviral chemicals and botanicals. Issues related to label claim. Unit IV Formulations, mode of action and application of different fungicides; chemotherapy and phytotoxicity of fungicides. Unit V Handling, storage and precautions to be taken while using fungicides; compatibility with other agrochemicals, persistence, cost-benefit ratio, factor affecting fungicides. New generation fungicides and composite formulations of pesticides. Unit VI Efficacy of different botanicals used and their mode of action. Important botanicals used against diseases. General account of plant protection appliances; environmental pollution, residues and health hazards, fungicidal resistance in plant pathogens and its management. Practicals</p> <ul style="list-style-type: none"> Acquaintance with formulation of different fungicides and plant protection appliances; Formulation of fungicides, bactericides and nematocides; <i>In-vitro</i> evaluation techniques, preparation of different concentrations of chemicals including botanical pesticides against pathogens; Persistence, compatibility with other agro-chemicals;

<ul style="list-style-type: none"> Detection of naturally occurring fungicide resistant mutants of pathogen; Methods of application of chemicals. <p>12 Detection and Management of Seed Borne Pathogens Course Code : PL PATH 512 Credit Hours : 2+1 Theory Unit I History and economic importance of seed pathology in seed industry, plant quarantine and SPS under WTO. Morphology and anatomy of typical monocotyledonous and dicotyledonous infected seeds. Unit II Recent advances in the establishment and subsequent cause of disease development in seed and seedling. Localization and mechanism of seed transmission in relation to seed infection, seed to plant transmission of pathogens. Unit III Seed certification and tolerance limits, types of losses caused by seed-borne diseases in true and vegetatively propagated seeds, evolutionary adaptations of crop plants to defend seed invasion by seed-borne pathogens. Epidemiological factors influencing the transmission of seed-borne diseases, forecasting of epidemics through seed-borne infection. Unit IV Production of toxic metabolites affecting seed quality and its impact on human, animal and plant health, management of seed-borne pathogens/diseases and procedure for healthy seed production. Seed health testing, methods for detecting microorganism. Practical <ul style="list-style-type: none"> Conventional and advanced techniques in the detection and identification of seed-borne fungi, bacteria and viruses; Relationship between seed-borne infection and expression of the disease in the field. </p>	<ul style="list-style-type: none"> Detection of naturally occurring fungicide resistant mutants of pathogen; Methods of application of chemicals. <p>12 Detection and Management of Seed Borne Pathogens Course Code : PL PATH 512 Credit Hours : 2+1 Theory Unit I History and economic importance of seed pathology in seed industry, plant quarantine and SPS under WTO. Morphology and anatomy of typical monocotyledonous and dicotyledonous infected seeds. Unit II Recent advances in the establishment and subsequent cause of disease development in seed and seedling. Localization and mechanism of seed transmission in relation to seed infection, seed to plant transmission of pathogens. Unit III Seed certification and tolerance limits, types of losses caused by seed-borne diseases in true and vegetatively propagated seeds, evolutionary adaptations of crop plants to defend seed invasion by seed-borne pathogens. Epidemiological factors influencing the transmission of seed-borne diseases, forecasting of epidemics through seed-borne infection. Unit IV Production of toxic metabolites affecting seed quality and its impact on human, animal and plant health, management of seed-borne pathogens/diseases and procedure for healthy seed production. Seed health testing, methods for detecting microorganism. Practical <ul style="list-style-type: none"> Conventional and advanced techniques in the detection and identification of seed-borne fungi, bacteria and viruses; Relationship between seed-borne infection and expression of the disease in the field. </p>
<p>13 Biological Control of Plant Pathogens Course Code : PL PATH 513 Credit Hours : 1+1 Theory Unit I Concept of biological control, definitions, importance, principles of plant disease management with bioagents, history of biological control, merits and demerits of biological control. Unit II Types of biological interactions, competition: mycoparasitism, exploitation for hypovirulence, rhizosphere colonization, competitive saprophytic ability, antibiosis, induced resistance, mycorrhizal associations, operational mechanisms and its relevance in biological control. Unit III Factors governing biological control, role of physical environment, agroecosystem, operational mechanisms and cultural practices in biological control of pathogens, pathogens and antagonists and their relationship, biocontrol agents, comparative approaches to biological control of plant pathogens by resident and introduced antagonists, control of soil-borne and foliar diseases. Compatibility of bioagents with agrochemicals and other antagonistic microbes. Unit IV Commercial production of antagonists, their delivery systems, application and monitoring, biological control in IDM, IPM and organic farming system, biopesticides available in market. Quality control system of biocontrol agents. Practical <ul style="list-style-type: none"> Isolation, characterization and maintenance of antagonists, methods of study of antagonism and antibiosis, application of antagonists against pathogen <i>in-vitro</i> and <i>in vivo</i> conditions; Preparation of different formulations of selected bioagents and their mass production; Quality parameters of biocontrol agents; One week exposure visit to commercial biocontrol agents production unit. </p>	<p>13 Biological Control of Plant Pathogens Course Code : PL PATH 513 Credit Hours : 1+1 Theory Unit I Concept of biological control, definitions, importance, principles of plant disease management with bioagents, history of biological control, merits and demerits of biological control. Unit II Types of biological interactions, competition: mycoparasitism, exploitation for hypovirulence, rhizosphere colonization, competitive saprophytic ability, antibiosis, induced resistance, mycorrhizal associations, operational mechanisms and its relevance in biological control. Unit III Factors governing biological control, role of physical environment, agroecosystem, operational mechanisms and cultural practices in biological control of pathogens, pathogens and antagonists and their relationship, biocontrol agents, comparative approaches to biological control of plant pathogens by resident and introduced antagonists, control of soil-borne and foliar diseases. Compatibility of bioagents with agrochemicals and other antagonistic microbes. Unit IV Commercial production of antagonists, their delivery systems, application and monitoring, biological control in IDM, IPM and organic farming system, biopesticides available in market. Quality control system of biocontrol agents. Practical <ul style="list-style-type: none"> Isolation, characterization and maintenance of antagonists, methods of study of antagonism and antibiosis, application of antagonists against pathogen <i>in-vitro</i> and <i>in vivo</i> conditions; Preparation of different formulations of selected bioagents and their mass production; Quality parameters of biocontrol agents; One week exposure visit to commercial biocontrol agents production unit. </p>
<p>14 Integrated Disease Management Course Code : PL PATH 514 Credit Hours : 2+1 Theory Unit I</p>	<p>14 Integrated Disease Management Course Code : PL PATH 514 Credit Hours : 2+1 Theory Unit I</p>

<p>Introduction, definition, concept and tools of disease management, components of integrated disease management- their limitations and implications.</p> <p>Unit II Development of IDM-basic principles, biological, chemical and cultural disease management.</p> <p>Unit III IDM in important crops- rice, wheat, cotton, sugarcane, chickpea, rapeseed and mustard, pearl millet, pulses, vegetable crops, fruit, plantation and spice crops.</p> <p>Practical</p> <ul style="list-style-type: none"> • Application of physical, biological and cultural methods; • Use of chemical and biocontrol agents, their compatibility and integration in IDM. Demonstration of IDM and multiple disease management in crops of regional importance as project work. 	<p>Introduction, definition, concept and tools of disease management, components of integrated disease management- their limitations and implications.</p> <p>Unit II Development of IDM-basic principles, biological, chemical and cultural disease management.</p> <p>Unit III IDM in important crops- rice, wheat, cotton, sugarcane, chickpea, rapeseed and mustard, pearl millet, pulses, vegetable crops, fruit, plantation and spice crops.</p> <p>Practical</p> <ul style="list-style-type: none"> • Application of physical, biological and cultural methods; • Use of chemical and biocontrol agents, their compatibility and integration in IDM. Demonstration of IDM and multiple disease management in crops of regional importance as project work.
<p>15 Diseases of Field and Medicinal Crops Course Code : PL PAT 515 Credit Hours : 2+1</p> <p>Theory</p> <p>Unit I Diseases of Cereal crops- Rice, wheat, barley, pearl millet, sorghum and maize.</p> <p>Unit II Diseases of Pulse crops- Gram, urdbean, mungbean, lentil, pigeonpea, soybean and cowpea.</p> <p>Unit III Diseases of Oilseed crops- Rapeseed and mustard, sesame, linseed, sunflower, groundnut, castor.</p> <p>Unit IV Diseases of Cash crops- Cotton, sugarcane.</p> <p>Unit V Diseases of Fodder legume crops- Berseem, oats, guar, lucerne.</p> <p>Unit VI Medicinal crops- <i>Plantago</i>, liquorice, mulathi, rosagrass, sacred basil, mentha, ashwagandha, <i>Aloe vera</i>.</p> <p>Practical</p> <ul style="list-style-type: none"> • Detailed study of symptoms and host parasite relationship of important diseases of above mentioned crops; • Collection and dry preservation of diseased specimens of important crops. 	<p>15 Diseases of Field and Medicinal Crops Course Code : PL PAT 515 Credit Hours : 2+1</p> <p>Theory</p> <p>Unit I Diseases of Cereal crops- Rice, wheat, barley, pearl millet, sorghum and maize.</p> <p>Unit II Diseases of Pulse crops- Gram, urdbean, mungbean, lentil, pigeonpea, soybean and cowpea.</p> <p>Unit III Diseases of Oilseed crops- Rapeseed and mustard, sesame, linseed, sunflower, groundnut, castor.</p> <p>Unit IV Diseases of Cash crops- Cotton, sugarcane.</p> <p>Unit V Diseases of Fodder legume crops- Berseem, oats, guar, lucerne.</p> <p>Unit VI Medicinal crops- <i>Plantago</i>, liquorice, mulathi, rosagrass, sacred basil, mentha, ashwagandha, <i>Aloe vera</i>.</p> <p>Practical</p> <ul style="list-style-type: none"> • Detailed study of symptoms and host parasite relationship of important diseases of above mentioned crops; • Collection and dry preservation of diseased specimens of important crops.
<p>16 Diseases of Fruits, Plantation and Ornamental Crops Course Code : PL PTH 516 Credit Hours : 2+1</p> <p>Theory</p> <p>Unit I Introduction, symptoms and etiology of different fruit diseases. Factors affecting disease development in fruits like apple, pear, peach, plum, apricot, cherry, walnut, almond, strawberry, citrus, mango, grapes, guava, ber, banana, pineapple, papaya, fig, pomegranate, date palm, custard apple and their management.</p> <p>Unit II Symptoms, mode of perpetuation of diseases of plantation crops such as tea, coffee, rubber and coconut and their management.</p> <p>Unit III Symptoms and life cycle of pathogens. Factors affecting disease development of ornamental plants such as roses, gladiolus, tulip, carnation, gerbera orchids, marigold, chrysanthemum and their management.</p> <p>Practical</p> <ul style="list-style-type: none"> • Detailed study of symptoms and host parasite relationship of representative diseases of plantation crops; • Collection and dry preservation of diseased specimens of important crops. 	<p>16 Diseases of Fruits, Plantation and Ornamental Crops Course Code : PL PTH 516 Credit Hours : 2+1</p> <p>I. Theory</p> <p>Unit I Introduction, symptoms and etiology of different fruit diseases. Factors affecting disease development in fruits like apple, pear, peach, plum, apricot, cherry, walnut, almond, strawberry, citrus, mango, grapes, guava, ber, banana, pineapple, papaya, fig, pomegranate, date palm, custard apple and their management.</p> <p>Unit II Symptoms, mode of perpetuation of diseases of plantation crops such as tea, coffee, rubber and coconut and their management.</p> <p>Unit III Symptoms and life cycle of pathogens. Factors affecting disease development of ornamental plants such as roses, gladiolus, tulip, carnation, gerbera orchids, marigold, chrysanthemum and their management.</p> <p>Practical</p> <ul style="list-style-type: none"> • Detailed study of symptoms and host parasite relationship of representative diseases of plantation crops; • Collection and dry preservation of diseased specimens of important crops.
<p>17 Diseases of Vegetable and Spices Crops Course Code : PL PATH 517 Credit Hours : 2+1</p> <p>Theory</p> <p>Unit I Nature, prevalence, factors affecting disease development of tuber, bulb, leafy vegetable, crucifers, cucurbits and solanaceous vegetables. Diseases of crops underprotected cultivation.</p> <p>Unit II Symptoms and management of diseases of different root, tuber, bulb,</p>	<p>17 Diseases of Vegetable and Spices Crops Course Code : PL PATH 517 Credit Hours : 2+1</p> <p>Theory</p> <p>Unit I Nature, prevalence, factors affecting disease development of tuber, bulb, leafy vegetable, crucifers, cucurbits and solanaceous vegetables. Diseases of crops underprotected cultivation.</p> <p>Unit II Symptoms and management of diseases of different root, tuber, bulb,</p>

<p>leafy vegetables, crucifers, cucurbits and solanaceous vegetable crops.</p> <p>Unit III Symptoms, epidemiology and management of diseases of different spice crops such as black pepper, nutmeg, saffron, cumin, coriander, turmeric, fennel, fenugreek and ginger. Biotechnological approaches in developing disease resistant transgenics.</p> <p>Practical Detailed study of symptoms and host pathogen interaction of important diseases of vegetable and spice crops.</p>	<p>leafy vegetables, crucifers, cucurbits and solanaceous vegetable crops.</p> <p>Unit III Symptoms, epidemiology and management of diseases of different spice crops such as black pepper, nutmeg, saffron, cumin, coriander, turmeric, fennel, fenugreek and ginger. Biotechnological approaches in developing disease resistant transgenics.</p> <p>Practical Detailed study of symptoms and host pathogen interaction of important diseases of vegetable and spice crops.</p>
<p>18 Post-Harvest Diseases Course Code : PL PATH 518 Credit Hours : 1+1 Theory Unit I Concept of post-harvest diseases, definitions, importance with reference to management and health, principles of plant disease management as pre-harvest and post-harvest, Types of post-harvest problems both by biotic and abiotic factors.</p> <p>Unit II Role of physical environment, agro-ecosystem leading to quiescent infection, operational mechanisms and cultural practices in perpetuation of pathogens, pathogens and antagonist and their relationship, role of biocontrol agents and chemicals in controlling post-harvest diseases, comparative approaches to control of plant pathogens by resident and introduced antagonists.</p> <p>Unit III Integrated approaches in controlling diseases and improving the shelf life of produce using nutritional, bio-control agents and other agents, control of aflatoxigenic and mycotoxigenic fungi, application and monitoring for health hazards.</p> <p>Unit IV Study of symptoms, toxicosis of various pathogens, knowledge of Codex Alimentarius for each product and commodity. Physical and biological agents/ practices responsible for development/ prevention of post-harvest diseases- traditional and improved practices.</p> <p>Practical</p> <ul style="list-style-type: none"> o Isolation, characterization and maintenance of post-harvest pathogens, application of antagonists against pathogens <i>in vivo</i> condition; o Comparative efficacy of different fungicides and bioagents; o Study of different post-harvest disease symptoms on cereals, pulses, oilseed, commercial crops, vegetables, fruits and flowers; o Visit to cold storage. 	<p>18 Post-Harvest Diseases Course Code : PL PATH 518 Credit Hours : 1+1 Theory Unit I Concept of post-harvest diseases, definitions, importance with reference to management and health, principles of plant disease management as pre-harvest and post-harvest, Types of post-harvest problems both by biotic and abiotic factors.</p> <p>Unit II Role of physical environment, agro-ecosystem leading to quiescent infection, operational mechanisms and cultural practices in perpetuation of pathogens, pathogens and antagonist and their relationship, role of biocontrol agents and chemicals in controlling post-harvest diseases, comparative approaches to control of plant pathogens by resident and introduced antagonists.</p> <p>Unit III Integrated approaches in controlling diseases and improving the shelf life of produce using nutritional, bio-control agents and other agents, control of aflatoxigenic and mycotoxigenic fungi, application and monitoring for health hazards.</p> <p>Unit IV Study of symptoms, toxicosis of various pathogens, knowledge of Codex Alimentarius for each product and commodity. Physical and biological agents/ practices responsible for development/ prevention of post-harvest diseases- traditional and improved practices.</p> <p>Practical</p> <ul style="list-style-type: none"> o Isolation, characterization and maintenance of post-harvest pathogens, application of antagonists against pathogens <i>in vivo</i> condition; o Comparative efficacy of different fungicides and bioagents; o Study of different post-harvest disease symptoms on cereals, pulses, oilseed, commercial crops, vegetables, fruits and flowers; o Visit to cold storage.
<p>19 Plant Quarantine and Regulations Course Code : PL PATH 519 Credit Hours : 1+0 Theory Unit I Historical development in plant quarantine, Definitions of pest, and transgenics as per Govt. notification; Organizational set up of plant quarantine in India. relative importance; quarantine – domestic and international. Quarantine restrictions in the movement of agricultural produce, seeds and planting material; case histories of exotic pests/ diseases and their status.</p> <p>Unit II Acts related to registration of pesticides and transgenics. History of quarantine legislations, Salient features of PQ Order 2003. Environmental Acts, Industrial registration; APEDA, Import and Export of bio-control agents.</p> <p>Unit III Identification of pest/ disease free areas; contamination of food with toxigens, microorganisms and their elimination; Symptomatic diagnosis and other techniques to detect pest/ pathogen infestations; VHT and other safer techniques of disinfestation/ salvaging of infected material.</p> <p>Unit IV WTO regulations; non-tariff barriers; Pest risk analysis, good laboratory practices for pesticide laboratories; pesticide industry; Sanitary and Phytosanitary measures. Visit to plant quarantine station and PEQ facilities.</p>	<p>19 Plant Quarantine and Regulations Course Code : PL PATH 519 Credit Hours : 1+0 Theory Unit I Historical development in plant quarantine, Definitions of pest, and transgenics as per Govt. notification; Organizational set up of plant quarantine in India. relative importance; quarantine – domestic and international. Quarantine restrictions in the movement of agricultural produce, seeds and planting material; case histories of exotic pests/ diseases and their status.</p> <p>Unit II Acts related to registration of pesticides and transgenics. History of quarantine legislations, Salient features of PQ Order 2003. Environmental Acts, Industrial registration; APEDA, Import and Export of bio-control agents.</p> <p>Unit III Identification of pest/ disease free areas; contamination of food with toxigens, microorganisms and their elimination; Symptomatic diagnosis and other techniques to detect pest/ pathogen infestations; VHT and other safer techniques of disinfestation/ salvaging of infected material.</p> <p>Unit IV WTO regulations; non-tariff barriers; Pest risk analysis, good laboratory practices for pesticide laboratories; pesticide industry; Sanitary and Phytosanitary measures. Visit to plant quarantine station and PEQ facilities.</p>

Ph.D.

Present Syllabus	Modified Syllabus
<p>1 Advances in Mycology Course Code : PL PATH 601 Credit Hours : 2+1 Theory Unit I General introduction, historical development and advances in mycology. Recent taxonomic criteria, morphological criteria for classification. Serological, chemical (chemotaxonomy), molecular and numerical (computer based assessment) taxonomy. Interaction between groups: Phylogeny, Micro conidiation, conidiogenesis and sporulating structures of fungi imperfecti.</p> <p>Unit II Population biology, pathogenic variability/ vegetative compatibility. Heterokaryosis and parasexual cycle. Sex hormones in fungi. Pleomorphism and speciation in fungi. Mechanism of nuclear inheritance. Mechanism of extra-nuclear inheritance. Biodegradation.</p> <p>Unit III Ultra structures and chemical constituents of fungal cells, functions of cell organelles. Mitosis, meiosis, gene action and regulation. Effects of fungal interaction with host plants and other microorganisms; parasitism, symbiosis and commensalism.</p> <p>Unit IV Genetic Improvement of Fungal strains. Fungal biotechnology. Fungi mediated synthesis of nano particles – characterization process and application. Mycotoxins problems and its management.</p> <p>Practical</p> <ul style="list-style-type: none"> Isolation, purification and identification of cultures, spores and mating typedetermination; Study of conidiogenesis-Phialides, porospores, arthospores; Study of fruiting bodies in Ascomycotina; Identification of fungi up to species level; Study of hyphal anastomosis; Morphology of representative plant pathogenic genera form different groups of fungi; Molecular characterization of fungi. 	<p>1 Advances in Mycology Course Code : PL PATH 601 Credit Hours : 2+1 Theory Unit I General introduction, historical development and advances in mycology. Recent taxonomic criteria, morphological criteria for classification. Serological, chemical (chemotaxonomy), molecular and numerical (computer based assessment) taxonomy. Interaction between groups: Phylogeny, Micro conidiation, conidiogenesis and sporulating structures of fungi imperfecti.</p> <p>Unit II Population biology, pathogenic variability/ vegetative compatibility. Heterokaryosis and parasexual cycle. Sex hormones in fungi. Pleomorphism and speciation in fungi. Mechanism of nuclear inheritance. Mechanism of extra-nuclear inheritance. Biodegradation.</p> <p>Unit III Ultra structures and chemical constituents of fungal cells, functions of cell organelles. Mitosis, meiosis, gene action and regulation. Effects of fungal interaction with host plants and other microorganisms; parasitism, symbiosis and commensalism.</p> <p>Unit IV Genetic Improvement of Fungal strains. Fungal biotechnology. Biotechnology of Edible and Medicinal Fungi, Fungi mediated synthesis of nano particles – characterization process and application. Mycotoxins problems and its management.</p> <p>Practical</p> <ul style="list-style-type: none"> Isolation, purification and identification of cultures, spores and mating typedetermination; Study of conidiogenesis-Phialides, porospores, arthospores; Study of fruiting bodies in fungi with special reference to edible and medicinal fungi; Identification of fungi up to species level; Study of hyphal anastomosis; Morphology of representative plant pathogenic genera form different groups of fungi; Molecular characterization of fungi.
<p>2 Advances in Plant Virology Course Code : PL PATH 602 Credit Hours : 2+1 Theory Unit I Origin, evolution and interrelationship with animal viruses. Virus morphology, structure, architecture, replication (overview of host and viral components required), assembly and virus specific cytological effects in infected plant cells. Mechanisms leading to the evolution of new viruses/ strains: mutation, recombination, pseudo- recombination, component re-assortment, etc.</p> <p>Unit II Major vector groups of plant viruses and their taxonomy, virus-vector relationship, molecular mechanism of virus transmission by vectors. Terminologies used in immunology and serology. Classification, structure and functions of various domains of Immunoglobulins. Production of Polyclonal and monoclonal antibodies for detection of viruses. Immuno/ serological assays (Slide agglutination tests, Test tube precipitation test, Double agar diffusion test, ELISA (DAC, DAS, TAS), Dot Immuno Binding Assay, and nucleic acid based assays for detection of plant viruses.</p> <p>Unit III Polymerase Chain Reaction based (PCR, reverse transcriptase PCR, multiplex PCR, Nested PCR, Real time/ q PCR) and non PCR based: LAMP, Fluorescent <i>in situ</i> hybridization (FISH), dot blot hybridization. Plant virus genome organization (General properties of plant viral genome- information content, coding and non- coding regions), replication, transcription and translational strategies of pararetroviruses, geminiviruses, tobamo-, poty-, bromo, cucumo, ilar, tospoviruses, satellite viruses and satellite RNA.</p>	<p>2 Advances in Plant Virology Course Code : PL PATH 602 Credit Hours : 2+1 Theory Unit I Origin, evolution and interrelationship with animal viruses. Virus morphology, structure, architecture, replication (overview of host and viral components required), assembly and virus specific cytological effects in infected plant cells. Mechanisms leading to the evolution of new viruses/ strains: mutation, recombination, pseudo- recombination, component re-assortment, etc.</p> <p>Unit II Major vector groups of plant viruses and their taxonomy, virus-vector relationship, molecular mechanism of virus transmission by vectors. Terminologies used in immunology and serology. Classification, structure and functions of various domains of Immunoglobulins. Production of Polyclonal and monoclonal antibodies for detection of viruses. Immuno/ serological assays (Slide agglutination tests, Test tube precipitation test, Double agar diffusion test, ELISA (DAC, DAS, TAS), Dot Immuno Binding Assay, and nucleic acid based assays for detection of plant viruses.</p> <p>Unit III Polymerase Chain Reaction based (PCR, reverse transcriptase PCR, multiplex PCR, Nested PCR, Real time/ q PCR) and non PCR based: LAMP, Fluorescent <i>in situ</i> hybridization (FISH), dot blot hybridization. Plant virus genome organization (General properties of plant viral genome- information content, coding and non- coding regions), replication, transcription and translational strategies of pararetroviruses, geminiviruses, tobamo-, poty-, bromo, cucumo, ilar, tospoviruses, satellite viruses and satellite RNA.</p>

<p>Unit IV Gene expression, regulation and viral promoters. Genetic engineering with plant viruses, viral suppressors, RNAi dynamics and resistant genes. Virus potential as vectors, genetically engineered resistance, transgenic plants. Techniques and application of tissue culture for production of virus free planting materials. Phylogenetic grouping system based on partial/ complete sequences of virus genomes and using of next generation sequencing technology in plant virus discovery.</p> <p>Practical</p> <ul style="list-style-type: none"> o Purification of viruses, SDS-PAGE for molecular weight determination, production of polyclonal antiserum, purification of IgG and conjugate preparation; o Acquaintance with different serological techniques (i) DAC-ELISA (ii) DAS-ELISA (iii) DIBA (iv) Western blots (v) (ab) 2-ELISA. Nucleic acid isolation, DOT-blot, southern hybridization, probe preparation, and autoradiography; o PCR application and viral genome cloning of PCR products, plasmid purification, enzyme digestion, sequencing, annotation of genes, analysis of viral sequences (use of gene bank, blast of viral sequences and phylogeny); o Bioinformatics analysis tools for virology (ORF finder, Gene mark, Gene ontology, BLAST, Clustal X/W, Tm pred and Phylogeny programs). 	<p>Unit IV Gene expression, regulation and viral promoters. Genetic engineering with plant viruses, viral suppressors, RNAi dynamics and resistant genes. Virus potential as vectors, genetically engineered resistance, transgenic plants. Techniques and application of tissue culture for production of virus free planting materials. Phylogenetic grouping system based on partial/ complete sequences of virus genomes and using of next generation sequencing technology in plant virus discovery.</p> <p>Practical</p> <ul style="list-style-type: none"> o Purification of viruses, SDS-PAGE for molecular weight determination, production of polyclonal antiserum, purification of IgG and conjugate preparation; o Acquaintance with different serological techniques (i) DAC-ELISA (ii) DAS-ELISA (iii) DIBA (iv) Western blots (v) (ab) 2-ELISA. Nucleic acid isolation, DOT-blot, southern hybridization, probe preparation, and autoradiography; o PCR application and viral genome cloning of PCR products, plasmid purification, enzyme digestion, sequencing, annotation of genes, analysis of viral sequences (use of gene bank, blast of viral sequences and phylogeny); o Bioinformatics analysis tools for virology (ORF finder, Gene mark, Gene ontology, BLAST, Clustal X/W, Tm pred and Phylogeny programs).
<p>3 Advances in Plant Pathogenic Prokaryotes Course Code : PL PATH 603 Credit Hours : 2+1 Theory Unit I Prokaryotic cell: Molecular basis for origin and evolution of prokaryotic life, RNA world, prokaryotic cytoskeletal proteins. Flagella structure, assembly and regulation. Structure and composition (bacteria) cell wall/ envelop, Types of secretion systems (TI to TIV) and their molecular interaction, fimbriae and pili (Type IV pili), Bacterial chromosomes and plasmids, other cell organelles. Growth, nutrition and metabolism in prokaryotes (Emmenden-Meyerhof-Parnas (EMP) pathway, Phosphoketolase Pathway and Entner Doudoroff Pathway). Unit II Current trends in taxonomy and identification of phytopathogenic prokaryotes: International code of nomenclature, Polyphasic approach, New/ special detection methods for identification of bacterial plant pathogens. Taxonomic ranks hierarchy; Identification, Advances in classification and nomenclature. Unit III Bacterial genetics: General mechanism of variability (mutation), specialized mechanisms of variability. Transposable genetic elements in bacteria-integron and prophages, Mechanism of gene transfer. Pathogenicity islands, horizontal gene transfer, Bacterial Pan-Genome. Bacteriophages: Composition, structure and infection. Classification and use of phages in plant pathology/ bacteriology. Host pathogen interactions: Molecular mechanism of pathogenesis: Pathogenicity factors of soft rot, necrosis, wilt, canker, etc. Immunization, induced resistance/ Systemic Acquired Resistance, Quorum sensing. Bacterial pathogenicity and virulence: Molecular mechanism of virulence and pathogenesis, bacterial secretion systems, pathogenicity of bacterial enzymes that degrade the cell walls, Role of hrp/ hrc genes and TALE effectors. Synthesis and regulation of EPSs. Unit V Beneficial Prokaryotes-Endophytes, PGPR, Phylloplane bacteria and their role in disease management. Endosymbionts for host defence. Advances in management of diseases caused by prokaryotes: genetic engineering, RNA silencing; CRISPR cas9. Practical Pathogenic studies and race identification, plasmid profiling of bacteria, fatty acid profiling of bacteria, RFLP profiling of bacteria and variability status, Endospore, Flagella staining, Test for secondary metabolite production, cyanides, EPS, siderophore, specific detection of phytopathogenic bacteria using species/ pathovar specific primers; Basic techniques in diagnostic kit development, Molecular tools to identify phytoendosymbionts; Important and emerging diseases and their management strategies.</p>	<p>3 Advances in Plant Pathogenic Prokaryotes Course Code : PL PATH 603 Credit Hours : 2+1 Theory Unit I Prokaryotic cell: Molecular basis for origin and evolution of prokaryotic life, RNA world, prokaryotic cytoskeletal proteins. Flagella structure, assembly and regulation. 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<p>4 Molecular Basis of Host-pathogen Interaction Course Code : PL PATH 604 Credit Hours : 2+1 Theory Unit I</p>	<p>4 Molecular Basis of Host-pathogen Interaction Course Code : PL PATH 604 Credit Hours : 2+1 Theory Unit I</p>

<p>History of host plant resistance and importance to Agriculture. Importance and role of biotechnological tools in plant pathology. Basic concepts and principles to study host pathogen relationship. Molecular genetics, imaging and analytical chemistry tools for studying plants, microbes, and their interactions.</p> <p>Unit II Different forms of plant-microbe interactions and nature of signals/ effectors underpinning these interactions. Plant innate immunity: PAMP/ DAMP. Molecular basis of host-pathogen interaction-fungi, bacteria, viruses and nematodes; recognition system, signal transduction.</p> <p>Unit III Induction of defence responses- HR, Programmed cell death, reactive oxygen species, systemic acquired resistance, induced systemic resistance, pathogenesis related proteins, phytoalexins and virus induced gene silencing. Molecular basis of gene-for-gene hypothesis; R-gene expression and transcription profiling, mapping and cloning of resistance genes and marker-aided selection, pyramiding of R genes. Gene for gene systems: Background, genetics, phenotypes, molecular mechanisms, races, breakdown of resistance (boom-and-bust cycles), Coevolution-arms race and trench warfare models, Metapopulations, cost of resistance, cost of unnecessary virulence, GFG in agricultural crops vs. natural populations, Durability of resistance, erosion of quantitative resistance.</p> <p>Unit IV Pathogen population genetics and durability, viruses vs cellular pathogens. Gene deployment, cultivar mixtures. Disease emergence, host specialization. Circadian clock genes in relation to innate immunity. Biotechnology and disease management; development of disease resistance plants using genetic engineering approaches, different methods of gene transfer, biosafety issues related to GM crops.</p> <p>Practical</p> <ul style="list-style-type: none"> Protein, DNA and RNA isolation, plasmid extraction, PCR analysis, DNA and Protein electrophoresis, bacterial transformation; Gene mapping and marker assisted selection; Development and use of molecular markers in identification and characterization of resistance to plant pathogens and their management. 	<p>History of host plant resistance and importance to Agriculture. Importance and role of biotechnological tools in plant pathology. Basic concepts and principles to study host pathogen relationship. Molecular genetics, imaging and analytical chemistry tools for studying plants, microbes, and their interactions.</p> <p>Unit II Different forms of plant-microbe interactions and nature of signals/ effectors underpinning these interactions. Plant innate immunity: PAMP/ DAMP. Molecular basis of host-pathogen interaction-fungi, bacteria, viruses and nematodes; recognition system, signal transduction.</p> <p>Unit III Induction of defence responses- HR, Programmed cell death, reactive oxygen species, systemic acquired resistance, induced systemic resistance, pathogenesis related proteins, phytoalexins and virus induced gene silencing. Molecular basis of gene-for-gene hypothesis; R-gene expression and transcription profiling, mapping and cloning of resistance genes and marker-aided selection, pyramiding of R genes. Gene for gene systems: Background, genetics, phenotypes, molecular mechanisms, races, breakdown of resistance (boom-and-bust cycles), Coevolution-arms race and trench warfare models, Metapopulations, cost of resistance, cost of unnecessary virulence, GFG in agricultural crops vs. natural populations, Durability of resistance, erosion of quantitative resistance.</p> <p>Unit IV Pathogen population genetics and durability, viruses vs cellular pathogens. Gene deployment, cultivar mixtures. Disease emergence, host specialization. Circadian clock genes in relation to innate immunity. Biotechnology and disease management; development of disease resistance plants using genetic engineering approaches, different methods of gene transfer, biosafety issues related to GM crops.</p> <p>Practical</p> <ul style="list-style-type: none"> Protein, DNA and RNA isolation, plasmid extraction, PCR analysis, DNA and Protein electrophoresis, bacterial transformation; Gene mapping and marker assisted selection; <p>Development and use of molecular markers in identification and characterization of resistance to plant pathogens and their management.</p>
<p>5 Principles and Procedures of Certification Course Code : PL PATH 605 Credit Hours : (1+0) Theory</p> <p>Unit I Introduction to certification. International scenario of certification and role of ISTA, EPPO, OECD, etc. in certification and quality control. Case studies of certification systems of USA and Europe. National Regulatory mechanism and certification system including seed certification, minimum seed certification standards. National status of seed health in seed certification. Methods for testing genetic identity, physical purity, germination percentage, seed health, etc. Fixing tolerance limits for diseases and insect pests in certification and quality control programmes.</p> <p>Unit II Methods used in certification of seeds, vegetative propagules and <i>in-vitro</i> cultures. Accreditation of seed testing laboratories. Role of seed/ planting material health certification in national and international trade.</p>	<p>5 Principles and Procedures of Certification Course Code : PL PATH 605 Credit Hours : (1+0) Theory</p> <p>Unit I Introduction to certification. International scenario of certification and role of ISTA, EPPO, OECD, etc. in certification and quality control. Case studies of certification systems of USA and Europe. National Regulatory mechanism and certification system including seed certification, minimum seed certification standards. National status of seed health in seed certification. Methods for testing genetic identity, physical purity, germination percentage, seed health, etc. Fixing tolerance limits for diseases and insect pests in certification and quality control programmes.</p> <p>Unit II Methods used in certification of seeds, vegetative propagules and <i>in-vitro</i> cultures. Accreditation of seed testing laboratories. Role of seed/ planting material health certification in national and international trade.</p>
<p>6 Plant Biosecurity and Biosafety Course Code : PATH 606 Credit Hours : 2+0 Theory</p> <p>Unit I History of biosecurity, Concept of biosecurity, Components of biosecurity, Quarantine, Invasive Alien Species, Biowarfare, Emerging/ resurgence of pests and diseases. Introduction and History of biosecurity and its importance.</p> <p>Unit II National Regulatory Mechanism and International Agreements/</p>	<p>6 Plant Biosecurity and Biosafety Course Code : PATH 606 Credit Hours : 2+0 Theory</p> <p>Unit I History of biosecurity, Concept of biosecurity, Components of biosecurity, Quarantine, Invasive Alien Species, Biowarfare, Emerging/ resurgence of pests and diseases. Introduction and History of biosecurity and its importance.</p> <p>Unit II National Regulatory Mechanism and International Agreements/</p>

Conventions, viz., Agreement on Application of Sanitary and Phytosanitary (SPS) Measures. World Trade Organization (WTO), Convention on Biological Diversity (CBD), International Standards for Phytosanitary Measures, pest risk analysis, risk assessment models, pest information system, early warning and forecasting system, use of Global Positioning System (GPS) and Geographic Information System (GIS) for plant biosecurity, pest/disease and epidemic management, strategies for combating risks and costs associated with agroterrorism event, mitigation planning, integrated approach for biosecurity.

Unit III

Biosafety, policies and regulatory mechanism, Cartagena Protocol on Biosafety and its implications, Issues related to release of genetically modified crops. Emerging/ resurgence of pests and diseases in the changing scenario of climatic conditions.

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Department of Agricultural Economics

Revised UG course curriculum

AAE-121 Fundamentals of Agricultural Economics

2(2+0)

Theory

Economics: Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macro economics, positive and normative analysis. Nature of economic theory; rationality assumption, concept of equilibrium, economic laws as generalization of human behavior. Basic concepts; Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics; meaning, definition, characteristics of agriculture, importance and its role in economics development. Agricultural planning and development in the country. Demand: meaning, law of demand, demand schedule and demand curve, determinants, utility theory; law of diminishing marginal utility, equi-marginal utility principle. Consumer's equilibrium and derivation of demand curve, concept of consumer surplus. Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity. Supply: Stock v/s supply, law of supply, supply schedule, supply curve, determinants of supply, elasticity of supply. Market structure: meaning and types of market, basic features of perfectly competitive and imperfect markets. Price determination under perfect competition: short run and long run equilibrium of firm and industry, shut down and break even points. Distribution theory: meaning, factor market and pricing of factors of production. Concepts of rent, wage, interest and profit. National income: Meaning and importance, circular flow, concepts of national income accounting and approaches to measurement, difficulties in measurement. Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programme on population control. Money: Barter system of exchange and its problems, evolution, meaning and functions of money, classification of money, money supply, general price index, inflation and deflation. Banking: Role in modern economy, types of banks, function of commercial and central bank, credit bank, credit creation policy. Public finance: meaning, micro v/s macro finance, public revenue and public expenditure. Tax: meaning, direct and indirect taxes, agricultural taxation, VAT. Economic system: Concepts of economy and its function, important features of capitalistic, socialistic and mixed economies, elements of economic planning.

Added contents:

Theories of consumer behavior. Value, rent and quasi rent, various cost concepts

Theory : Agricultural Marketing: Concepts and definition of market, marketing, agricultural marketing, market structure, marketing mix and market segmentation, classification and characteristics of agricultural markets: demand, supply and producer's surplus of agri-commodities: nature and determinants of demand and supply of farm products, producer's surplus-meaning and its types, marketable and marketed surplus, factors affecting marketable surplus of agri-commodities; product life cycle (PLC) and competitive strategies: Meaning and stages in PLC; characteristics of PLC, strategies in different stages of PLC; pricing and promotion strategies; pricing consideration and approaches-cost based and competition based pricing; market promotion- advertising, personal selling, sales promotion and publicity – their meaning and merits & demerits; marketing process and functions: marketing process-concentration, dispersion and equalization; exchange functions-buying and selling; physical function-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; number of channel levels; marketing channels for different farm products; integration, efficiency, costs and price spread: Meaning, definition and types of market integration; marketing efficiency; marketing channel: number of channel levels: marketing channels for different farm products; Integration, efficiency, costs and price spread: Meaning, definition and types of market integration; marketing efficiency; marketing costs of farm commodities; ways of reducing marketing costs. Role of Govt. in agricultural marketing: Public sector institutions- CWC, SWC, FCI, CACO, & 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 prices and policy; Trade: Concept of International Trade and its need, theories of absolute and comparative advantage. Present status and prospects of international trade in agri-commodities; GATT and WTO; Agreement on Agriculture (AoA) and its implications on Indian agriculture; IPR.

Practical

Plotting and study of demand and supply curves and calculation of elasticity; Study of relationship between market arrivals and prices of some selected commodities; Computation of marketable and marketed surplus of important commodities; Study of price behavior over time for some selected commodities; Construction of index numbers; 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- NAFED, SWC, CWC, cooperative marketing society, etc. to study their organization and functioning; Application of principles of comparative advantage of international trade.

Added contents:

APMC regulated markets, Farmers producers organizations, e-NAM, meaning and concept of value chain of agriculture commodities.

AAE-311 Agricultural Finance and Co-operation

3 (2+1)

Theory : Agricultural Finance-meaning, scope and significance, credit needs and its role in Indian agriculture. Agricultural credit: meaning, definition, need, classification. Credit analysis: 4 R's, and 3c's of credits. Sources of agricultural finance: institutional and non-institutional sources, commercial banks, social control and nationalization of commercial banks, Micro financing including KCC. Lead bank scheme, RRBs, scale of finance and unit cost. An introduction to higher financing institution-RBI, NABARD, ADB, IMF, World Bank, Insurance and credit Guarantee Corporation of India. Cost of credit. Recent development in agricultural credit Preparation and analysis of financial statements-Balance Sheet and Income statement. Basic guidelines for preparation of project reports-Bank norms-SWOT analysis. Agricultural cooperation-Meaning, brief history of cooperative development in India, objectives, principles of cooperation, significance of cooperatives in Indian agriculture. Agricultural cooperation in India-credit of marketing. Consumer and multi-purpose cooperatives, farmer's service cooperative societies, processing cooperatives, farming cooperatives, cooperative warehousing; role of ICA, NCUI, NCDC, NAFED.

Practical

Determination of most profitable level of capital use. Optimum allocation of limited amount of capital among different enterprise. Analysis of progress and performance of cooperatives using published data. Analysis of progress and performance of commercial banks and RRBs using published data. Visit to commercial bank, cooperative bank and cooperative society to acquire firsthand knowledge of their management, schemes and procedures. Estimation of credit requirement of farm business- A case study. Preparation and analysis of balance sheet- A case study. Preparation and analysis of income statement-A case study. Appraisal of a loan proposal- A case study. Techno-economics parameters for preparation of projects. Preparation of Bankable projects for various agricultural products and its value added products. Seminar on selected topic.

Added contents:

5 C's of credit, Pradhan Mantri Kisan samman Nidhi Yojana, subsidy on agricultural inputs, Schemes introduced by the state government and Central Government.

Theory: Meaning and concept of farm management, objectives and relationship with other sciences. Meaning and definition of farms, its types and characteristics, factor determining types and size of farm. Principles of farm management: concept of production function and its type, use of production function in decision-making on a farm, factor-product, factor-factor and product-product relationship, law of equi-marginal/or principles of opportunity cost and law of comparative advantage. Meaning and concept of cost, types of costs and their interrelationship, importance of cost in managing farm business and estimation of gross farm income, net farm income, family labor income and farm business. Farm business analysis: meaning and concept of farm income and profitability, technical and economic efficiency measures in crop and livestock enterprises. Importance of farm records and accounts in managing a farm, various types of farm records needed to maintain on farm, farm inventory, balance sheet, profit and loss accounts. Meaning and importance of farm planning and budgeting, partial and complete budgeting, steps in farm planning and budgeting-linear programming, appraisal of farm resources, selection of crops and livestock's enterprises. Concept of risk and uncertainty occurs in agriculture production, nature and sources of risks and its management strategies, Crop/livestock/machinery insurance- weather based crop insurance, features, determinants of compensation. Concepts of resource economics, differences between NRE and agriculture, economics, unique properties of natural resources. Positive and negative externalities in agriculture, Inefficiency and welfare loss, solutions, important issues in economics and management of common property resources of land, water, pasture and forest resources etc.

Practical

Preparation of farm layout. Determination of cost of fencing of a farm. Computation of depreciation cost of farm asset. Application of equi-marginal returns/opportunity cost principle on allocation of farm resources. Determination of most profitable level of inputs use in a farm production process. Determination of least cost combination of inputs. Selection of most profitable enterprise combination. Application of cost principles including CACP concepts in the estimation of cost crop and livestock enterprises. Preparation of farm plan and budget, farm records and accounts and profit & loss accounts. Collection and analysis of data on various resources in India.

Added Contents:

Technical changes, impact assessment of agricultural technologies, CACP cost concepts, cost of cultivation and cost of production of regional crop production.

The Dean,
College of Agriculture,
SVPUA&T, Meerut



Through proper Channel

Subject: Regarding Partial Revision of course content in Introductory Biology (B.Sc Ag. Hons. Ist Sem.)

Sir,

With reference to Point no. 1, of your letter no. Dean (Ag.)/SVPUAT/5944, dated 11/08/2022, regarding changes in the course curriculum of Undergraduate courses, the following changes are proposed in the above said course:

Name and course code, Credit hrs	Existing Course Content	Addition/Deletion suggested in topics
Introductory Biology (UGR - 112) Cr. Hrs : 2(1-0-1)	Introduction to the living world, diversity and characteristics of life, origin of life, Evolution and Eugenics. Binomial nomenclature and Classification, Cell and Cell division. Morphology of flowering plants. Seed and seed germination. Plant systematic-viz; Brassicaceae, Fabaceae and Poaceae. Role of animals in agriculture.	1. Deletion of topics: Role of animals in agriculture. 2. Addition of topics: Basics of Environment and Ecology.

Archana
20/08/22
(Archana Arya)
Instructor



forwarded to Dean Agriculture.

For
20.8.22

for meerkat team

20.8.22

To,

The Dean

College of Agriculture

SVPUAT, Meerut

Date: 22/08/2022



Through: Proper channel

Subject: To delete some contents of syllabus of Elementary Mathematics (UGR 113) of B.Sc (Ag.)

Sir,

As per letter No. SVP/Dean (Ag)/2022/5931 dated 30/07/22, kindly find the following submission for deleting some contents of the syllabus for the course Elementary Mathematics (UGR 113) offered in B.Sc (Agriculture), as the syllabus contents are more than that of credit hours 2(2+0) and this part is less applicable then the other parts of the syllabus.

S. N o.	Course name /Code/ Credit hours	Syllabus	Deletion proposed
1	Elementary Mathematics /UGR 113/2(2+0)	<p>Theory Equations : (Linear , Quadratic) ,Elementary idea of Set Theory ,Elementary idea of permutation and combination, Bionomial theorem (positive index only) Logarithm</p> <p>Straight lines : Distance formula, section formula (internal and external division), Change of axes (only origin changed), Equation of co-ordinate axes, Equation of lines parallel to axes, Slope-intercept form of equation of line, Slope-point form of equation of line, Two point form of equation of line, Intercept form of equation of line, Normal form of equation of line, General form of equation of line, Point of intersection of two st. lines, Angles between two st. lines, Parallel lines, Perpendicular lines, Angle of bisectors between two lines, Area of triangle and quadrilateral.</p> <p>Circle: Equation of circle whose centre and radius is known, General equation of a circle, Equation of circle passing through three given points, Equation of circle whose diameters is line joining two points (x_1, y_1) & (x_2, y_2), Tangent and Normal to a given circle at given point (Simple problems), Condition of tangency of a line $y = mx + c$ to the given circle $x^2 + y^2 = a^2$.</p> <p>Differential Calculus : Definition of function, limit and continuity, Simple 41 problems on limit, Simple problems on continuity, Differentiation of x^n , e^x , $\sin x$ & $\cos x$ from first principle, Derivatives of sum, difference, product and quotient of two functions, Differentiation of functions of functions (Simple problem based on it), Logarithmic differentiation (Simple problem based on it), Differentiation by substitution method and simple problems based on it, Differentiation of Inverse Trigonometric functions. Maxima and Minima of the functions of the form $y=f(x)$ (Simple problems based on it). Integral Calculus : Integration of simple functions, Integration of Product of two functions, Integration by substitution method, Definite Integral (simple problems based on it), Area under simple well-known curves (simple problems based on it). Matrices and Determinants: Definition of Matrices, Addition, Subtraction, Multiplication, Transpose and Inverse up to 3rd order, Properties of determinants up to 3rd order and their evaluation</p>	Bionomial theorem (positive index only), Tangent and Normal to a given circle at given point (Simple problems), Condition of tangency of a line $y = mx + c$ to the given circle $x^2 + y^2 = a^2$

Submitted for your kind approval please

Sincerely

Dr. Prerna Sharma

Associate Professor (Mathematics)

Department of Basic Science, SVPUAT, Meerut

Forwarded for m. D.

forwarded to Dean Agriculture
in reference to notice
no. SVP/Dean Ag/2022/5931 dt. 30/7/22

To,

Date: 20/08/2022

The Dean

Sardar Vallabhbhai Patel University of Agriculture & Technology
Meerut - 250 110 (U.P.)

Through Proper Channel

Sub: Restructured and Revised Syllabi of Under-graduate Programmes-reg.



Sir,

With reference to the above cited subject, find enclosed herewith the required modification as follows:

S. N.	Course Title/ Course Code/ Credit	Syllabus	Addition/ deletion proposed
1	BAS 213 Statistical Methods 2(1+1)	<p>Theory</p> <p>Introduction to Statistics and its Applications in Agriculture, Graphical Representation of Data, Measures of Central Tendency & Dispersion, Definition of Probability, Addition and Multiplication Theorem (without proof). Simple Problems Based on Probability. Binomial & Poisson Distributions, Definition of Correlation, Scatter Diagram. Karl Pearson's Coefficient of Correlation. Linear Regression Equation. Introductions to Test of Significance, One sample & two sample test t for Means, Chi-Square Test of Independence of Attributes in Contingency Table. Introduction to Analysis of Variance, Analysis of One Way Classification. Introduction to Sampling Methods, Sampling versus Complete Enumeration; Simple Random Sampling with and without replacement, use of Fandom Number Tables for selection of Simple Random Sample.</p> <p>Practical</p> <p>Graphical Representation of Data. Measures of Central Tendency (Ungrouped data) with Calculation of Quartiles, Deciles & Percentiles. Measures of Central Tendency (Grouped data) with Calculation of Quartiles, Deciles & Percentiles. Measures of Dispersion (Ungrouped Data). Measures of Dispersion (Grouped Data). Moments, Measures of Skewness & Kurtosis (Ungrouped Data). Moments, Measures of Skewness & Kurtosis (Grouped Data). Correlation & Regression</p>	<p>Addition:</p> <p>Basic principles of designs- randomization, replication and local control.</p> <p>Uniformity trial, size and shape of plots and blocks; Analysis of variance: completely randomized design, randomized block design and Latin square design.</p>

forwarded to Dean Agriculture for its consideration
vide notice no. SVP/Dean Ag/2022/5931. dt: 30/7/22



Department of Basic Science
Sardar Vallabhbhai Patel University of Agriculture & Technology,
Meerut – 250110 (U.P.)

Letter No. SVP/BS/2022/
Date:

Through Proper Channel

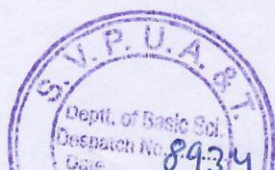
To,

Dean AG

SVPUAT, Meerut

In reference to proceeding of the Agriculture Faculty Meeting was held on 04/08/2022 letterno. 5944 dated 11-08-2022, under the Point 1, I am proposing addition of the following topic in the syllabus of Agri-Informatics (BAS 212), B.Sc.(Ag.) II yr College of Agriculture.

Sno.	Course Name/ Course Code/ Credit Hrs.	Existing Syllabus	Addition/Deletion
1	Agri-Informatics/ (BAS 212) / 2(1+1)	Theory Introduction to Computers, Operating Systems, definition and types, Applications of MS-Office for document creation & Editing, Data presentation, interpretation and graph creation, statistical analysis, mathematical expressions, Database, concepts and types, uses of DBMS in Agriculture, World Wide Web (WWW): Concepts and components. Introduction to computer programming languages, concepts and standard input/output operations. e-Agriculture, concepts and applications, Use of ICT in Agriculture. Computer Models for understanding plant processes. IT application for computation of water and nutrient requirement of crops. Computer-controlled devices (automated systems) for Agri-input management, Smartphone Apps in Agriculture for farm advises, market	Addition in Practical Syllabus: Short cut keys of MS word and Hindi typing



Perwarded to Dean Agriculture.

		<p>price, postharvest management etc; Geospatial technology for generating valuable agri-information. Decision support systems, concepts, components and applications in Agriculture, Agriculture Expert System, Soil Information Systems etc for supporting Farm decisions. Preparation of contingent crop-planning using IT tools.</p> <p>Practical</p> <p>Study of Computer Components, accessories, practice of important DOS Commands. Introduction of different operating systems such as windows, Unix/ Linux, Creating, Files & Folders, File Management. Use of MS-WORD and MS Power-point for creating, editing and presenting a scientific Document. MS-EXCEL - Creating a spreadsheet, use of statistical tools, writing expressions, creating graphs, analysis of scientific data. MS-ACCESS: Creating Database, preparing queries and reports, demonstration of Agri-information system. Introduction to World Wide Web (WWW). Introduction of programming languages. Hands on Crop Simulation Models (CSM) such as DSSAT/Crop-Info/CropSyst/ Wofost; Computation of water and nutrient requirements of crop using CSM and IT tools. Introduction of Geospatial Technology for generating valuable information for Agriculture. Hands on Decision Support System. Preparation of contingent crop planning.</p>	
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Vineeta
20/08/2022

(Vineeta Verma)

Sr	Existing Course syllabus	New Syllabus as per BSMA	Proposed changes
1	<p>I. Course Title : Computer Fundamentals and Programming</p> <p>II. Course Code : MCA 501</p> <p>III. Credit Hours : 2+1</p> <p>IV. Aim of the course: This is a course on Computer Fundamentals and Programming that aims at exposing the students to understand how computer works, analytical skills to solve problems using computers. And to write computer programs using C.</p> <p>V. Theory Unit I Functional units of computer, I/O devices, primary and secondary memories. Number systems: decimal, octal, binary and hexadecimal; Representation of integers, fixed and floating point numbers, Operator precedence, character representation; ASCII, Unicode. Unit II Programming Fundamentals with C - Algorithm, techniques of problem solving, flowcharting, stepwise refinement; Constants and variables; Data types: integer, character, real, data types; Arithmetic expressions, assignment statements, logical expressions. Control flow</p> <p>VI. Practical • Conversion of different number types; • Creation of flow chart, conversion of algorithm/flowchart to program; • Mathematical operators, operator</p>	<p>VII. Course Title : Computer Fundamentals and Programming</p> <p>VIII. II. Course Code : MCA 501</p> <p>IX. III. Credit Hours : 2+1</p> <p>X. Aim of the course: This is a course on Computer Fundamentals and Programming that aims at exposing the students to understand how computer works, analytical skills to solve problems using computers. And to write computer programs using C.</p> <p>XI. Theory Unit I Functional units of computer, I/O devices, primary and secondary memories. Number systems: decimal, octal, binary and hexadecimal; Representation of integers, fixed and floating point numbers, Operator precedence, character representation; ASCII, Unicode. Unit II Programming Fundamentals with C - Algorithm, techniques of problem solving, flowcharting, stepwise refinement; Constants and variables; Data types: integer, character, real, data types; Arithmetic expressions, assignment statements, logical expressions. Control flow Unit III Arrays and structures. Pointers, dynamic memory allocations Unit IV Program Structures – functions, subroutines Unit V I/O operations, Program correctness; Debugging and testing of programs.</p> <p>XII. Practical • Conversion of different number types; • Creation of flow chart, conversion of algorithm/flowchart to program; • Mathematical operators, operator precedence; • Sequence, control and iteration; • Arrays and string</p>	<p>Suggested Changes: Database, concepts and types, uses of DBMS in Agriculture, e-Agriculture, concepts and applications should be included in place of UNIT III.</p>

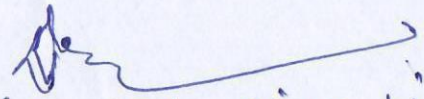


forwarded to Dean Agriculture for its
onward transmission to Dean PGIS for
its consideration.

Paul
22/8/22

(Deepak Sisodia)
Assoc. Prof., Basic

	precedence; • Sequence, control and iteration;	processing; • Matrix operations, Sorting, Pointers and File processing – Reading and writing text files.	
2	<p>MCA 502 INTRODUCTION TO NETWORKING AND INTERNET APPLICATIONS 1+1</p> <p>Objective The course is aimed to provide fundamentals of networking and application protocols with the emphasis on developing web based applications.</p> <p>Theory</p> <p>UNIT I Networking fundamentals, types of networking, network topology; Introduction to File Transfer Protocol (FTP), Telnet, Simple Mail Transfer Protocol (SMTP).</p> <p>UNIT II World Wide Web (WWW), working with Internet; Web pages, web sites, web servers; Web Applications.</p> <p>UNIT III Hyper Text Markup Language (HTML), DHTML, web based application development.</p> <p>Practical Network and mail configuration; Using Network Services; Browsing of Internet; Creation of web pages; Creation of websites using HTML and Creation of websites using DHTML.</p>	<p>Course Title : Introduction to Networking and Internet Applications</p> <p>Course Code : MCA 511</p> <p>Credit Hours : 1+1</p> <p>Aim of the course: This is a course on Introduction to Networking and Internet Applications that aims at exposing the students to understand Computer networking and web applications development.</p> <p>Theory</p> <p>Unit I Networking fundamentals, types of networking, network topology; Introduction to File Transfer Protocol (FTP), Telnet, Simple Mail Transfer Protocol (SMTP), Internet Protocol v4 & v6. Network infrastructure and Security-switches, routers, firewall, intranet, internet, Virtual Private Network Unit II World Wide Web (www), working with Internet; Web pages, web sites, web servers; Web Applications.</p> <p>Unit III Hyper Text Markup Language (HTML), DHTML, web based application development. Static websites, dynamic websites. Client Side processing – scripting languages, JQuery. Server Side processing ASP.NET/JSP</p> <p>Practical • Network and mail configuration; • Using Network Services; • Browsing of Internet; • Creation of web pages; • Creation of websites using HTML and scripting languages</p>	<p>Topics to be added in UNIT I- IP Addresses, URLs, Reference Model: TCP/IP and OSI</p> <p>*In existing system the course code of this course is MCA 502.</p>


 (Deepak Sisodia)
 Assoc. Prof.



कृषि जैव प्रौद्योगिकी विभाग
सरदार वल्लभभाई पटेल कृषि एवं प्रौद्योगिकी विश्वविद्यालय
मेरठ - 250110

डॉ. आर० एस० सेंगर
प्राध्यापक एवं विभागाध्यक्ष

स० व० प० / बी० टी० / 2022' / 2697
दिनांक: 26 / 08 / 2022

सेवा में,

अधिष्ठाता कृषि
कृषि महाविद्यालय
स० व० प० कृषि विश्वविद्यालय,
मेरठ - 250110

अवगत कराना है कि अधिष्ठाता कृषि जी से हुई वार्ता के अनुपालन में विभाग द्वारा संचालित स्नातक कोर्स AGB-111 (Foundation of Plant Biochemistry and Biotechnology) का संशोधित Syllabus अग्रिम कार्यवाही हेतु प्रेषित।

(आर० एस० सेंगर)

Sh. B. R. Singh

Dean
College of Agriculture

1. Fundamentals of Plant Biochemistry and Biotechnology 3(2+1) AGB 111

Theory

Importance of Biochemistry. Properties of Water, pH and Buffer. Carbohydrate: Importance and classification. Structures of Monosaccharides, Reducing and oxidizing properties of Monosaccharides, Mutarotation; Structure of Disaccharides and Polysaccharides. Lipid: Importance and classification; Structures and properties of fatty acids; storage lipids and membrane lipids. Proteins: Importance of proteins and classification; Structures, titration and zwitterions nature of amino acids; Structural organization of proteins. Enzymes: General properties; Classification; Mechanism of action; Michaelis & Menten and Line Weaver Burk equation & plots; Introduction to allosteric enzymes.

Nucleic acids: Importance and classification; Structure of Nucleotides, A, B & Z DNA; RNA: Types and Secondary & Tertiary structure. Metabolism of carbohydrates: Glycolysis, TCA cycle, Glyoxylate cycle, Electron transport chain. Metabolism of lipids: Beta oxidation, Biosynthesis of fatty acids.

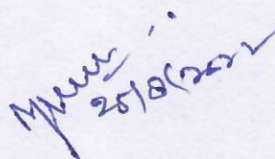
Concepts and applications of plant biotechnology: Introduction to Recombinant DNA Technology, Tools of Genetic engineering (Restriction enzymes, DNA Polymerases, DNA ligase, Alkaline phosphatase, Polynucleotide Kinase, Terminal deoxynucleotidyl transferase and Topoisomerases). Clone and cloning vectors: Plasmids, Phage vectors, Phasmids, Cosmids and their cloning capacities. DNA Finger printing, Gene transformation methods, physical (Gene gun method), chemical (PEG mediated) and *Agrobacterium* mediated gene transfer methods; Transgenics and its importance in crop improvement; Introduction to PCR and its applications; **Molecular Markers:** RFLP, RAPD, SSR; Marker Assisted Breeding in crop improvement; Biotechnology regulations.

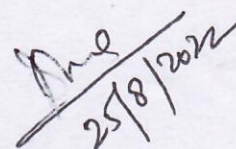
Plant Tissue culture: Introduction and History of Plant Culture, Micro-propagation methods; **Stages of Micropropagation**, organogenesis and embryogenesis, Synthetic seeds and their significance; Embryo rescue and its significance; somatic hybridization and cybrids; Somaclonal variation and its use in crop improvement; cryo-preservation; Scope, organ culture, embryo culture, cell suspension culture, callus culture, anther culture, pollen culture and ovule culture and their applications; **Applications of Plant Tissue Culture, Applications of plant biotechnology in crop improvement with special emphasis to Western Uttar Pradesh.**

Practical

Preparation of solution, pH & buffers, Qualitative tests of carbohydrates and amino acids. Quantitative estimation of glucose/ proteins. Titration methods for estimation of amino acids/lipids, Effect of pH, temperature and substrate concentration on enzyme action, Paper chromatography/ TLC demonstration for separation of amino acids/ Monosaccharides. Sterilization techniques. Composition of various tissue culture media and preparation of stock solutions for MS nutrient medium. Callus induction from various explants. Micro-propagation, hardening and acclimatization. Demonstration on isolation of DNA. Demonstration of gel electrophoresis techniques and DNA finger printing.


25/8/2022


25/8/2022


25/8/2022

Dr. Gaje Singh

Professor and Head



Department of Entomology

**S. V. P. University of Agriculture & Tech.,
Meerut – 250 110 (U.P.), India**

Dean(Ag)

S.V.P. Uni. of Ag. & Tech.

Meerut- 250110

Sir,

In reference of your letter No. SVP/Dean/5903 dated 7.07.2022, I am submitting the SSR from April-2012 to March-2022 for necessary action at your end please.



G. Singh
25-08-2022
(G.SINGH)

Sh. B. Singh
by **Dean**
College of Agriculture

Department of Entomology: College of Agriculture

New Course (U.G.)

Course Title : Fundamentals of Entomology
Credit hours : 4(3+1)
Course Code : ENT-121

Original syllabus	Deletion in original syllabus	Addition in original syllabus	Final syllabus
<p>Part - I</p> <p>History of Entomology in India. Factors for insect's abundance. Major points related to dominance of Insecta in Animal kingdom. Classification of phylum Arthropoda upto classes. Relationship of class Insecta with other classes of Arthropoda. Morphology: Structure and functions of insect cuticle and molting. Body segmentation. Structure of Head, thorax and abdomen. Structure and modifications of insect antennae, mouth parts, legs, Wing venation, modifications and wing coupling apparatus. Structure of male and female genital organ. Metamorphosis and diapause in insects. Types of larvae and pupae. Structure and functions of digestive, circulatory, excretory, respiratory, nervous, secretory (Endocrine) and reproductive system, in insects. Types of reproduction in insects. Major sensory organs like simple and compound eyes, chemoreceptor.</p> <p>Part-II</p> <p>Insect Ecology: Introduction, Environment and its components. Effect of abiotic factors-temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents. Effect of biotic factors – food competition, natural and environmental resistance. Concepts of Balance of life in nature, biotic potential and environmental resistance and causes for outbreak of pests in agro-ecosystem.</p> <p>Part III</p> <p>Pest surveillance and pest forecasting. Categories of pests. Host plant resistance, Cultural, Mechanical, Physical. Legislative. Biological (parasites, predators & transgenic plant pathogens such as bacteria, fungi and viruses) methods of control. Chemical control-importance, hazards and limitations. Classification of insecticides, toxicity of insecticides and formulations of insecticides. Recent methods of pest control, repellents, antifeedants, hormones, attractants, gamma radiation and genetic control. Practices, scope and limitations of IPM. Insecticides Act 1968-Important provisions. Application techniques of spray fluids. Phytotoxicity of insecticides. Symptoms of poisoning, first aid and antidotes. Beneficial insects: parasites and predators used in pest control and their mass multiplication techniques. Important groups of microorganisms, bacteria, viruses and fungi used in pest control and their mass multiplication techniques. Important species of pollinators, weed killers and scavengers, their importance.</p>	<p>-No-</p>	<p>Part – IV</p> <p>International code of Zoological Nomenclature</p>	<p>Part - I</p> <p>History of Entomology in India. Factors for insect's abundance. Major points related to dominance of Insecta in Animal kingdom. Classification of phylum Arthropoda upto classes. Relationship of class Insecta with other classes of Arthropoda. Morphology: Structure and functions of insect cuticle and molting. Body segmentation. Structure of Head, thorax and abdomen. Structure and modifications of insect antennae, mouth parts, legs, Wing venation, modifications and wing coupling apparatus. Structure of male and female genital organ. Metamorphosis and diapause in insects. Types of larvae and pupae. Structure and functions of digestive, circulatory, excretory, respiratory, nervous, secretory (Endocrine) and reproductive system, in insects. Types of reproduction in insects. Major sensory organs like simple and compound eyes, chemoreceptor.</p> <p>Part-II</p> <p>Insect Ecology: Introduction, Environment and its components. Effect of abiotic factors-temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents. Effect of biotic factors – food competition, natural and environmental resistance. Concepts of Balance of life in nature, biotic potential and environmental resistance and causes for outbreak of pests in agro-ecosystem.</p> <p>Part III</p> <p>Pest surveillance and pest forecasting. Categories of pests. Host plant resistance, Cultural, Mechanical, Physical. Legislative. Biological (parasites, predators & transgenic plant pathogens such as bacteria, fungi and viruses) methods of control. Chemical control-importance, hazards and limitations. Classification of insecticides, toxicity of insecticides and formulations of insecticides. Recent methods of pest control, repellents, antifeedants, hormones, attractants, gamma radiation and genetic control. Practices, scope and limitations of IPM. Insecticides Act 1968-Important provisions. Application techniques of spray fluids. Phytotoxicity of insecticides. Symptoms of poisoning, first aid and antidotes. Beneficial insects, parasites and predators used in pest control and their mass multiplication techniques. Important groups of microorganisms, bacteria, viruses and fungi used in pest control and their mass multiplication</p>

Part – IV

Systematics: Taxonomy –importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order. Classification of class Insecta upto Orders, basic groups of present day insects with special emphasis to orders and families of Agricultural importance like Orthoptera: Acrididae, Tettigoniidae, Gryllidae, Gryllotalpidae; Dictyoptera: Mantidae, Blattidae; Odonata; Isoptera: Termitidae; Thysanoptera: Thripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae, Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidae, Aleurodidae, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera: Pieridae, Papilionidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidae, Bruchidae, Scarabaeidae; Hymenoptera: Tenthredinidae, Apidae. Trichogrammatidae, Ichneumonidae, Braconidae, Chalcididae; Diptera: Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae, Muscidae, Tephritidae.

Practical

Methods of collection and preservation of insects including immature stages; External features of Grasshopper/Blister beetle; Types of insect antennae, mouthparts and legs; Wing venation, types of wings and wing coupling apparatus. Types of insect larvae and pupae; Dissection of digestive system in insects (Grasshopper); Dissection of male and female reproductive systems in insects (Grasshopper); Study of characters of orders Orthoptera, Dictyoptera, Odonata, Isoptera, Thysanoptera, Hemiptera, Lepidoptera, Neuroptera, Coleoptera, Hymenoptera, Diptera and their families of agricultural importance

techniques. Important species of pollinators, weed killers and scavengers, their importance.

Part – IV

Systematics: **International code of Zoological Nomenclature** Taxonomy – importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order. Classification of class Insecta upto Orders, basic groups of present day insects with special emphasis to orders and families of Agricultural importance like Orthoptera: Acrididae, Tettigoniidae, Gryllidae, Gryllotalpidae; Dictyoptera: Mantidae, Blattidae; Odonata; Isoptera: Termitidae; Thysanoptera: Thripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae, Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidae, Aleurodidae, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera: Pieridae, Papilionidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidae, Bruchidae, Scarabaeidae; Hymenoptera: Tenthredinidae, Apidae. Trichogrammatidae, Ichneumonidae, Braconidae, Chalcididae; Diptera: Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae, Muscidae, Tephritidae.

Practical

Methods of collection and preservation of insects including immature stages; External features of Grasshopper/Blister beetle; Types of insect antennae, mouthparts and legs; Wing venation, types of wings and wing coupling apparatus. Types of insect larvae and pupae; Dissection of digestive system in insects (Grasshopper); Dissection of male and female reproductive systems in insects (Grasshopper); Study of characters of orders Orthoptera, Dictyoptera, Odonata, Isoptera, Thysanoptera, Hemiptera, Lepidoptera, Neuroptera, Coleoptera, Hymenoptera, Diptera and their families of agricultural importance

Course Title : Pests of crops and stored grains and their management
 Credit hours : 3(2+1)
 Course Code : ENT-311

Original syllabus	Deletion in original syllabus	Addition in original syllabus	Final syllabus
<p>Theory</p> <p>General account on nature and type of damage by different arthropods pests. Scientific name, order, family, host range, distribution, biology and bionomics, nature of damage, and management of major pests and scientific name, order, family, host range, distribution, nature of damage and control practice other important arthropod pests of various field crop, vegetable crop, fruit crop, plantation crops, ornamental crops, narcotics, spices and condiments. Factors affecting losses of stored grain and role of physical, biological, mechanical and chemical factors in deterioration of grain. Insect pests, mites, rodents, birds and microorganisms associated with stored grain and their management. Storage structure and methods of grain storage and fundamental principles of grain store management.</p> <p>Practical</p> <p>Identification of different types of damage. Identification and study of life cycle and seasonal history of various insect pests attacking crops and their produce: (a) Field Crops; (b) Vegetable Crops; (c) Fruit Crops; (d) Plantation, gardens, Narcotics, spices & condiments. Identification of insect pests and Mites associated with stored grain. Determination of insect infestation by different methods. Assessment of losses due to insects. Calculations on the doses of insecticides application technique. Fumigation of grain store / godown. Identification of rodents and rodent control operations in godowns. Identification of birds and bird control operations in godowns. Determination of moisture content of grain. Methods of grain sampling under storage condition. Visit to Indian Storage Management and Research Institute, Hapur and Quality Laboratory, Department of Food., Delhi. Visit to nearest FCI godowns.</p>	-No-	<p>Theory</p> <p>Role of cash crops in increasing the economic status of Farmers of Western Uttar Pradesh</p>	<p>Theory</p> <p>General account on nature and type of damage by different arthropods pests. Scientific name, order, family, host range, distribution, biology and bionomics, nature of damage, and management of major pests and scientific name, order, family, host range, distribution, nature of damage and control practice other important arthropod pests of various field crop, vegetable crop, fruit crop, plantation crops, ornamental crops, narcotics, spices and condiments. Factors affecting losses of stored grain and role of physical, biological, mechanical and chemical factors in deterioration of grain. Insect pests, mites, rodents, birds and microorganisms associated with stored grain and their management. Storage structure and methods of grain storage and fundamental principles of grain store management. Role of cash crops in increasing the economic status of Farmers of Western Uttar Pradesh of Farmer</p> <p>Practical</p> <p>Identification of different types of damage. Identification and study of life cycle and seasonal history of various insect pests attacking crops and their produce: (a) Field Crops; (b) Vegetable Crops; (c) Fruit Crops; (d) Plantation, gardens, Narcotics, spices & condiments. Identification of insect pests and Mites associated with stored grain. Determination of insect infestation by different methods. Assessment of losses due to insects. Calculations on the doses of insecticides application technique. Fumigation of grain store / godown. Identification of rodents and rodent control operations in godowns. Identification of birds and bird control operations in godowns. Determination of moisture content of grain. Methods of grain sampling under storage condition. Visit to Indian Storage Management and Research Institute, Hapur and Quality Laboratory, Department of Food., Delhi. Visit to nearest FCI godowns.</p>

Course Title : Management of Beneficial Insects
 Credit hours : 2(1+1)
 Course Code : ENT-321

Original syllabus	Deletion in original syllabus	Addition in original syllabus	Final syllabus
<p>Theory</p> <p>Importance of beneficial Insects, Beekeeping, pollinating plant and their cycle, bee biology, commercial methods of rearing, equipment used, seasonal management, bee enemies and disease. Bee pasturage, bee foraging and communication. Insect pests and diseases of honey bee.</p> <p>Types of silkworm, voltinism and biology of silkworm. Mulberry cultivation, mulberry varieties and methods of harvesting and preservation of leaves. Rearing, mounting and harvesting of cocoons. Pest and diseases of silkworm, management, rearing appliances of mulberry silkworm and methods of disinfection.</p> <p>Species of lac insect, morphology, biology, and host plant, lac production – seed lac, button lac, shellac, lac- products. Identification of major parasitoids and predators commonly being used in biological control.</p> <p>Insect orders bearing predators and parasitoids used in pest control and their mass multiplication techniques. Important species of pollinator, weed killers and scavengers with their importance.</p> <p>Practical</p> <p>Honey bee species, castes of bees. Beekeeping appliances and seasonal management, bee enemies and disease. Bee pasturage, bee foraging and communication. Types of silkworm, voltinism and biology of silkworm. Mulberry cultivation, mulberry varieties and methods of harvesting and preservation of leaves. Species of lac insect, host plant identification. Identification of other important pollinators, weed killers and scavengers. Visit to research and training institutions devoted to beekeeping, sericulture, lac culture and natural enemies.</p>	-No-	<p>Theory</p> <p>Role of bio pesticide in integrated pest management of different crops of Western U.P.</p>	<p>Theory</p> <p>Importance of beneficial Insects, Beekeeping, pollinating plant and their cycle, bee biology, commercial methods of rearing, equipment used, seasonal management, bee enemies and disease. Bee pasturage, bee foraging and communication. Insect pests and diseases of honey bee.</p> <p>Types of silkworm, voltinism and biology of silkworm. Mulberry cultivation, mulberry varieties and methods of harvesting and preservation of leaves. Rearing, mounting and harvesting of cocoons. Pest and diseases of silkworm, management, rearing appliances of mulberry silkworm and methods of disinfection.</p> <p>Species of lac insect, morphology, biology, host plant, lac production – seed lac, button lac, shellac, lac- products. Identification of major parasitoids and predators commonly being used in biological control.</p> <p>Insect orders bearing predators and parasitoids used in pest control and their mass multiplication techniques. Important species of pollinator, weed killers and scavengers with their importance. Role of bio pesticide in integrated pest management of different crops of western U.P.</p> <p>Practical</p> <p>Honey bee species, castes of bees. Beekeeping appliances and seasonal management, bee enemies and disease. Bee pasturage, bee foraging and communication. Types of silkworm, voltinism and biology of silkworm. Mulberry cultivation, mulberry varieties and methods of harvesting and preservation of leaves. Species of lac insect, host plant identification. Identification of other important pollinators, weed killers and scavengers. Visit to research and training institutions devoted to beekeeping, sericulture, lac culture and natural enemies.</p>

REVISED SYLLABUS OF UNDER-GRADUATE PROGRAMME
DEPARTMENT OF AGRICULTURAL EXTENSION & COMMUNICATION

SVP/Ag.Bx.&Com/
Disp.No. 4683
Date 25-08-22



Sh. Khori
Dean
College of Agriculture

SARDAR VALLABHBHAI PATEL UNIVERSITY AGRICULTURE &
TECHNOLOGY

B.Sc. (Ag.) Hons. in Agricultural Extension and Communication

Major Course

AEC - 112	Rural Sociology & Educational Psychology	2(1+1)
AEC - 121	Fundamentals of Agricultural Extension Education	3(2+1)
AEC - 211	Communication Skills and Personality Development	2(1+1)
AEC - 312	Entrepreneurship Development and Business Communication	2(1+1)

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25/8/2022

Head

Deptt. of Agril. Extn. & Communica
S.V.P.U.A.&T., Meerut-250110

B.Sc. (Ag.) Hons. in Agricultural Extension and Communication

Exiting Course with Title & Code No.	Addition in Present Course	Final Course Content
<p>I. Course Title : Rural Sociology & Educational Psychology II. Course Code : AEC - 112 III. Credit Hours : 2(2+0) Theory : Sociology and Rural sociology: Definition and scope, its significance in agriculture extension, Social Ecology, Rural society, Social Groups, Social Stratification, Culture concept, Social Institution, Social Change Development Educational psychology: Meaning & its importance in agriculture extension. Behavior Cognitive, affective, psychomotor domain, Personality, Learning. Motivation, Theories of Motivation, Intelligence</p> <p>I. Course Title : Fundamentals of Agricultural Extension Education II. Course Code : AEC - 121 III. Credit Hours : 3 (2+1) Theory Education : Meaning, definition & Types; Extension Education - meaning, definition, scope and process, objectives and principles of Extension Education; Extension Programme planning - Meaning, Process, Principles and Steps in Programme Development Extension systems in India: extension efforts in preindependence era (Sriniketan, Marthandam, Firka Development Scheme, Gurgaon Experiment, etc.) and post-independence era (Etawah Pilot Project, Nilokheri Experiment, etc.); various extension/ agriculture development programmes launched by ICAR/ Govt. of India (IADP, IAAP, HYVP, KVK, MVP, ORP, ND, NATP, NAIP, etc.). New trends in agriculture extension: privatization extension, cyber extension/ eextension, market-led extension, farmer-led extension, expert systems, etc. Rural Development concept, meaning, definition; various rural development programmes launched by Govt. of India. Community Dev.-meaning, definition, concept & principles, Philosophy of C.D. Rural Leadership concept and definition, types of leaders in rural context; extension administration: meaning and concept principles and functions. Monitoring and evaluation: concept and definition, monitoring and evaluation of extension programmes; transfer of technology: concept and models, capacity building of extension personnel; extension teaching methods: meaning, classification, individual, group and mass contact methods, ICT Applications in TOT (New and Social Media), media mix strategies; communication: meaning and definition; Principles and Functions of Communication, models and barriers to communication Agriculture journalism; diffusion and adoption of innovation: concept and meaning, process and stages of adoption,</p>	<p>Social caste and class ; Characteristics, Importance and differences between caste and class.</p> <p>PMGSY, PMFBY, PMKSN, PMMSY, Swamitva Yojna</p>	<p>I. Course Title : Rural Sociology & Educational Psychology II. Course Code : AEC - 112 III. Credit Hours : 2(2+0) Theory : Sociology and Rural sociology: Definition and scope, its significance in agriculture extension, Social Ecology, Rural society, Social Groups, Social Stratification, Culture concept, Social Institution, Social Change Development Educational psychology: Meaning & its importance in agriculture extension. Behavior Cognitive, affective, psychomotor domain, Personality, Learning. Motivation, Theories of Motivation, Intelligence.</p> <p>Addition : Social caste and class; Characteristics, Importance and differences between caste and class.</p> <p>I. Course Title : Fundamentals of Agricultural Extension Education II. Course Code : AEC - 121 III. 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Rural Leadership concept and definition, types of leaders in rural context; extension administration: meaning and concept principles and functions. Monitoring and evaluation: concept and definition, monitoring and evaluation of extension programmes; transfer of technology: concept and models, capacity building of extension personnel; extension teaching methods: meaning, classification, individual, group and mass contact methods, ICT Applications in TOT (New and Social Media), media mix strategies; communication: meaning and definition; Principles and Functions of Communication, models and barriers to communication Agriculture journalism; diffusion and adoption of innovation: concept and meaning, process and stages of adoption,</p>

<p>adopter categories.</p> <p>Practical: To get acquainted with university extension system. Group discussion-exercise; handling and use of audio visual equipments and digital camera and LCD projector; preparation and use of AV aids, preparation of extension literature - leaflet, booklet, folder, pamphlet news stories and success stories; Presentation skills exercise, micro teaching exercise: A visit to village to understand the problems being encountered by the villagers/ farmers; to study organization and functioning of DRDA and other development departments at district level; visit to NGO and learning from their experience in rural development; understanding PRA techniques and their application in village development planning; exposure to mass media: visit to community radio and television studio for understanding the process of programme production; script writing, writing for print and electronic media, developing script for radio and television.</p> <p>I. Course Title: Communication skills and Personality Development II. Course Code: BAS-211/ AEC-211 III. Credit Hours: 2 (1+1)</p> <p>Theory: Communication Skills: Structural and functional grammar; meaning and process of communication, verbal and nonverbal communication; listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures. Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations, impromptu presentation, public speaking; Group discussion. Organizing seminars and conferences.</p> <p>Practical: Listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures. Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations.</p> <p>I. Course Title: Entrepreneurship Development and Business Communication II. Course Code: AEC – 312/ AAE- 312 III. Credit Hours: 2(1+1)</p> <p>Theory: Concept of Entrepreneur, Entrepreneurship Development, Characteristics of entrepreneurs; SWOT Analysis & achievement motivation, Government policy and programs and institutions for entrepreneurship development, Impact of economic reforms on Agribusiness/ Agrienterprises, Entrepreneurial Development Process; Business Leadership Skills; Developing organizational skill (controlling, supervising, problem solving, monitoring & evaluation),</p>	<p>Type of Communication, Style of Communication and Various in Communication and Importance of Communication</p> <p>Types of Entrepreneurs, difference between entrepreneur and entrepreneurship, women entrepreneurship in India : Definition and concepts, importance, scope, category of women entrepreneurs, problems</p>	<p>adopter categories.</p> <p>Addition : PMGSY, PMFBY, PMKSN, PMMSY, Swamitva Y Practical: To get acquainted with university extension sys Group discussion-exercise; handling and use of audio v equipments and digital camera and LCD projector; preparation use of AV aids, preparation of extension literature - leaflet, boc folder, pamphlet news stories and success stories; Presenta skills exercise, micro teaching exercise: A visit to villag understand the problems being encountered by the villag farmers; to study organization and functioning of DRDA and c development departments at district level; visit to NGO and lea from their experience in rural development; understanding techniques and their application in village development plan exposure to mass media: visit to community radio and telev studio for understanding the process of programme produc script writing, writing for print and electronic media, develo script for radio and television.</p> <p>I. 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Reading and comprehension of gei and technical articles, precise writing, summarizing, abstrac individual and group presentations.</p> <p>I. Course Title: Entrepreneurship Development and Business Communication II. Course Code: AEC– 312/ AAE- 312 III. Credit Hours: 2(1+1)</p> <p>Theory: Concept of Entrepreneur, Entrepreneurship Developn Characteristics of entrepreneurs; SWOT Analysis & achiever motivation, Government policy and programs and institution: entrepreneurship development, Impact of economic reform: Agribusiness/ Agrienterprises, Entrepreneurial Developr Process; Business Leadership Skills; Developing organizational (controlling, supervising, problem solving, monitoring & evaluat</p>
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<p>Developing Managerial skills, Business Leadership Skills (Communication, direction and motivation Skills), Problem solving skill, Supply chain management and Total quality management, Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agri-entrepreneurship and rural enterprise.</p> <p>Practical: Assessing entrepreneurial traits, problem solving skills, managerial skills and achievement motivation, exercise in creativity, time audit through planning, monitoring and supervision, identification and selection of business idea, preparation of business plan and proposal writing, visit to entrepreneurship development institute and entrepreneurs.</p>	<p>of women entrepreneurs in India.</p>	<p>Developing Managerial skills, Business Leadership (Communication, direction and motivation Skills), Problem solving skill, Supply chain management and Total quality management, Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agri-entrepreneurship and enterprise.</p> <p>Addition : Types of Entrepreneurs, difference between entrepreneur and entrepreneurship, women entrepreneurship in India : Definition and concepts, importance, scope, categories of women entrepreneurs, problems of women entrepreneurs in India.</p> <p>Practical: Assessing entrepreneurial traits, problem solving skills, managerial skills and achievement motivation, exercise in creativity, time audit through planning, monitoring and supervision, identification and selection of business idea, preparation of business plan and proposal writing, visit to entrepreneurship development institute and entrepreneurs.</p>
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(Signature)

25/8/2012

Head

Deptt. of Agril. Extn. & Communica
S.V.P.U.A.&T., Meerut-250110

PROPOSED COURSE CURRICULA FOR ADDITION/DELETION

Department of Agronomy: College of Agriculture

Course contents

Name of Programme: **B.Sc. (Ag.) Agronomy**

Fundamentals of Agronomy **4(3+1)**

Theory

Agronomy and its scope, seeds and sowing, tillage and tilth, crop density and geometry, Crop nutrition, manures and fertilizers, nutrient use efficiency, water resources, soil-plant-water relationship, crop water requirement, water use efficiency, irrigation-scheduling criteria and methods, quality of irrigation water, water logging.

Weeds- importance, classification, crop-weed competition, concepts of weed management-principles and methods, herbicides- classification, selectivity and resistance, allelopathy.

Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, crop management technologies in problematic areas, harvesting and threshing of crops.

Practical

Identification of crops, seeds, fertilizers, pesticides and tillage implements, study of agro-climatic zones of India, Identification of weeds in crops, Methods of herbicide and fertilizer application, Study of yield contributing characters and yield estimation, Seed germination and viability test. Numerical exercises on fertilizer requirement, plant population, herbicides and water requirement, Use of tillage implements-reversible plough, one way plough, harrow, leveler, seed drill, Study of soil moisture measuring devices, Measurement of field capacity, bulk density and infiltration rate, Measurement of irrigation water.

Addition: in theory

- Important National agricultural institutes
- Agronomical Biofortification in field crops

Addition: in practical

- Numerical exercises on seed rate and moisture estimation in soil

Theory

Meaning and scope of agricultural meteorology; Earth atmosphere- its composition, extent and structure; Atmospheric weather variables; Atmospheric pressure, its variation with height; Wind, types of wind, daily and seasonal variation of wind speed, cyclone, anticyclone, land breeze and sea breeze; Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave, longwave and thermal radiation, net radiation, albedo; Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, Energy balance of earth; Atmospheric humidity, concept of saturation, vapor pressure, process of condensation, formation of dew, fog, mist, frost, cloud; Precipitation, process of precipitation, types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification; Artificial rainmaking. Monsoon- mechanism and importance in Indian agriculture, Weather hazards - drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold-wave. Agriculture and weather relations; Modifications of crop microclimate, climatic normals for crop and livestock production. Weather forecasting- types of weather forecast and their uses. Climate change, climatic variability, global warming, causes of climate change and its impact on regional and national Agriculture.

Practical

Visit of Agrometeorological Observatory, site selection of observatory, exposure of instruments and weather data recording. Measurement of total, shortwave and longwave radiation, and its estimation using Planck's intensity law. Measurement of albedo and sunshine duration, computation of Radiation Intensity using BSS. Measurement of maximum and minimum air temperatures, its tabulation, trend and variation analysis. Measurement of soil temperature and computation of soil heat flux. Determination of vapor pressure and relative humidity. Determination of dew point temperature. Measurement of atmospheric pressure and analysis of atmospheric conditions. Measurement of wind speed and wind direction, preparation of wind rose. Measurement, tabulation and analysis of rain. Measurement of open pan evaporation and evapotranspiration. Computation of PET and AET.

Addition: in theory

- Climate smart agriculture

Crop Production Technology-I (*Kharif* Crops)

3(2+1)

Theory

Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of *Kharif* crops. Cereals – rice, maize, sorghum, pearl millet and finger millet, pulses-pigeonpea, mungbean and urdbean; oilseeds- groundnut, and soybean; fibre crops- cotton & jute; forage crops-sorghum, cowpea, cluster bean and napier.

Practical

Rice nursery preparation, transplanting of rice, sowing of soybean, pigeonpea and mungbean, maize, groundnut and cotton, effect of seed size on germination and seedling vigour of *kharif* season crops, effect of sowing depth on germination of *kharif* crops, identification of weeds in *kharif* season crops, top dressing and foliar feeding of nutrients, study of yield contributing characters and yield calculation of *kharif* season crops, study of crop varieties and important agronomic experiments at experimental farm. Study of forage experiments, morphological description of *kharif* season crops, visit to research centres of related crops.

Addition: in theory

- Value addition in important *kharif* crops

Crop Production Technology-II (*Rabi* crops)

3(2+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-rape seed, 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.

Addition: in theory

- Value addition in *rabi* crops

Addition: in practical

- Yield estimation in important *rabi* season crops

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.

Addition: in theory

- Natural and organic farming systems

Practical Crop Production-I (*Kharif Crops*)

2(0+2)

Practical

Crop planning, raising field crops in multiple cropping systems: Field preparation, seed, treatment, nursery raising, sowing, nutrient, water and weed management and management of insect-pests diseases of crops, harvesting, threshing, drying winnowing, storage and marketing of produce. The emphasis will be given to seed production, mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.

Addition: in practical

- Post harvest management and value addition in major kharif crops.

Practical Crop Production-II (*Rabi Crops*)

2(0+2)

Practical

Crop planning, raising field crops in multiple cropping systems: Field preparation, seed, treatment, nursery raising, sowing, nutrient, water and weed management and management of insect-pests diseases of crops, harvesting, threshing, drying winnowing, storage and marketing of produce. The emphasis will be given to seed production, mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.

Addition: in practical

- Post harvest management and value addition in major rabi crops

Principles of Organic Farming

2(1+1)

Theory

Organic farming, principles and its scope in India; Initiatives taken by Government (central/ state), NGOs and other organizations for promotion of organic agriculture; Organic ecosystem and their concepts; Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming; Fundamentals of insect, pest, disease and weed management under organic mode of production; Operational structure of NPOP; Certification process and standards of organic farming; Processing, leveling, economic considerations and viability, marketing and export potential of organic products.

Practical

Visit of organic farms to study the various components and their utilization; Preparation of enriched compost, vermicompost, bio-fertilizers/bio-inoculants and their quality analysis; Indigenous technology knowledge (ITK) for nutrient, insect, pest disease and weed management; Cost of organic production system; Post harvest management; Quality aspect, grading, packaging and handling.

Addition: in theory

- Natural farming: its concepts, principles and scope in Indian context

Addition: in practical

- Visit of natural farming unit/site
- Study of Beejamrit, Jeevamrit, Ghanjeevmarit and Vanafsa

Geoinformatics, Nano-technology and Precision Farming 2(1+1)

Theory

Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture; Geo-informatics- definition, concepts, tool and techniques; their use in Precision Agriculture. Crop discrimination and Yield monitoring, soil mapping; fertilizer recommendation using geospatial technologies; Spatial data and their management in GIS; Remote sensing concepts and application in agriculture; Image processing and interpretation; Global positioning system (GPS), components and its functions; Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach for precision agriculture; Nanotechnology, definition, concepts and techniques, brief introduction about nanoscale effects, nano-particles, nano-pesticides, nano-fertilizers, nano-sensors, Use of nanotechnology in seed, water, fertilizer, plant protection for scaling-up farm productivity.

Practical

Introduction to GIS software, spatial data creation and editing. Introduction to image processing software. Visual and digital interpretation of remote sensing images. Generation of spectral profiles of different objects. Supervised and unsupervised classification and acreage estimation. Multispectral remote sensing for soil mapping. Creation of thematic layers of soil fertility based on GIS. Creation of productivity and management zones. Fertilizers recommendations based of VRT and STCR techniques. Crop stress (biotic/abiotic) monitoring using geospatial technology. Use of GPS for agricultural survey. Formulation, characterization and applications of nano particles in agriculture. Projects formulation and execution related to precision farming.

Addition: in theory

- Use of drones in agriculture for survey and precision input management

Addition: in practical

- Study of drone and its application in agriculture

Rainfed Agriculture and Watershed Management – (New) 2(1+1)

Theory

Rainfed agriculture: Introduction, types, History of rainfed agriculture and watershed in India; Problems and prospects of rainfed agriculture in India; Soil and climatic conditions prevalent in rainfed areas; Soil and water conservation techniques, Drought: types, effect of water deficit on physio-morphological characteristics of the plants, Crop adaptation and mitigation to drought; Water harvesting: importance, its techniques, Efficient utilization of water through soil and crop management practices, Management of crops in rainfed areas, Contingent crop planning for aberrant weather conditions, Concept, objective, principles and components of watershed management, factors affecting watershed management.

Practical

Studies on climate classification, studies on rainfall pattern in rainfed areas of the country and pattern of onset and withdrawal of monsoons. Studies on cropping pattern of different rainfed areas in the country and demarcation of rainfed area on map of India. Interpretation of meteorological data and scheduling of supplemental irrigation on the basis of evapo-transpiration demand of crops. Critical analysis of rainfall and possible drought period in the country, effective rainfall and its calculation. Studies on cultural practices for mitigating moisture stress. Characterization and delineation of model watershed. Field demonstration on soil & moisture conservation measures. Field demonstration on construction of water harvesting structures. Visit to rainfed research station/watershed.

Addition: in theory

- Importance of natural farming practices in relation to rainfed agriculture

Addition: in practical

- Studies on natural, organic and chemical farming in rainfed conditions

कृषि महाविद्यालय

कृषि संकाय परिषद की बैठक दिनांक 04.08.2022 का कार्यवृत्त



दिनांक 04.08.2022 को अपराह्न 4.00 बजे कृषि संकाय (BOAF) की बैठक अधिष्ठाता कार्यालय के सभाकक्ष में आहूत की गयी जिसमें निम्नलिखित सदस्यों द्वारा प्रतिभाग कर निम्नलिखित बिन्दुओं पर विस्तारपूर्वक चर्चा उपरान्त निर्णय लिये गये।

बिन्दु सं0-1

कृषि छात्रों के स्नातक पाठ्यक्रम को रोजगारपरक (Employability), मूल्यवर्धक (Value Addition), स्थानीय एवं क्षेत्रीय आवश्यकतानुसार बनाने हेतु संशोधित पाठ्यक्रमों को विभागाध्यक्षों के माध्यम से प्रस्तुत किया जायेगा।

कार्यवाही: सम्बन्धित विभागाध्यक्ष।

बिन्दु सं0-2

BSMA के अनुसार स्नातकोत्तर पाठ्यक्रमों को और रोजगारपरक (Employability) मूल्यवर्धक (Value Addition), स्थानीय, क्षेत्रीय आवश्यकतानुसार बनाने हेतु उसमें आवश्यक संशोधन कर विभागाध्यक्षों के माध्यम से प्रस्तुत किया जायेगा।

कार्यवाही: सम्बन्धित विभागाध्यक्ष।

बिन्दु सं0-3

कृषि स्नातक पाठ्यक्रम में ELP को लाभप्रद बनाने हेतु चर्चा की गई।

कार्यवाही: समन्वयक ELP

बिन्दु सं0-4

कृषि स्नातक पाठ्यक्रम के अर्न्तगत Organic farming विषय में Natural Farming के समायोजन हेतु सुझाव दिये गये।

कार्यवाही: डा0, आर. बी. यादव।

बिन्दु सं0-5

डा0 डी. वी. सिंह, प्राध्यापक, कीट, विज्ञान को सर्वसम्मति से सचिव, कृषि संकाय मनोनीत किया गया।

बैठक में निम्न वैज्ञानिकों/शिक्षकों, अधिकारियों ने प्रतिभाग किया-

क्र.सं.	सदस्य का नाम	पदनाम
1.	डा0 विवेक	अधिष्ठाता (कृषि)
2.	डा0 आर0 के0 नरेश	प्राध्यापक, सस्य विज्ञान विभाग
3.	डा0 रामजी सिंह	प्राध्यापक, पादप रोग विज्ञान विभाग
4.	डा0 पूरन चन्द	प्राध्यापक, आनुवंशिकी एवं पादप प्रजनन विभाग
5.	डा0 राज कुमार	प्राध्यापक, पशुपालन एवं सचिव, कृषि संकाय परिषद
6.	डा0 एच0 एल0 सिंह	प्राध्यापक, कृषि अर्थशास्त्र विभाग
7.	डा0 सतेन्द्र कुमार	प्राध्यापक एवं विभागाध्यक्ष, मृदा विज्ञान विभाग

8.	डा० गजे सिंह	प्राध्यापक एवं विभागाध्यक्ष, कीट विज्ञान विभाग
9.	डा० आर० एन० यादव	प्राध्यापक एवं विभागाध्यक्ष, कृषि प्रसार विभाग
10.	डा० सुनील मलिक	प्राध्यापक एवं विभागाध्यक्ष, उद्यान विभाग
11.	डा० कमल खिलाड़ी	प्राध्यापक एवं विभागाध्यक्ष, पादप रोग विज्ञान
12.	डा० आर० एस० सेंगर	प्राध्यापक एवं विभागाध्यक्ष, कृषि जैव प्रौद्योगिकी विभाग
13.	डा० पुष्पेन्द्र कुमार	प्राध्यापक, कृषि जैव प्रौद्योगिकी विभाग
14.	डा० आर० बी० यादव	प्राध्यापक, सस्य विज्ञान विभाग
15.	डा० डी० के० सिंह	प्राध्यापक, कृषि प्रसार विभाग
16.	डा० डी० वी० सिंह	प्राध्यापक, कीट विज्ञान विभाग
17.	डा० राजेन्द्र सिंह	सह-प्राध्यापक, कीट विज्ञान विभाग
18.	डा० एस० पी० सिंह	सह-प्राध्यापक, मृदा विज्ञान विभाग
19.	डा० विपिन कुमार	सह-निदेशक, उद्यान विभाग
20.	डा० योगेश कुमार	सह-प्राध्यापक, मृदा विज्ञान विभाग
21.	डा० अरविन्द कुमार	सह-निदेशक, उद्यान विभाग
22.	डा० शिव कुमार सिंह	सह-प्राध्यापक, आनुवांशिकी एवं पादप प्रजनन विभाग
23.	डा० हेम सिंह	सह-प्राध्यापक, कीट विज्ञान विभाग
24.	डा० एल० बी० सिंह	प्राध्यापक, कृषि प्रसार विभाग
25.	डा० सत्य प्रकाश	प्राध्यापक, उद्यान विभाग
26.	डा० मुकेश कुमार	सह-प्राध्यापक, कृषि जैव प्रौद्योगिकी विभाग
27.	डा० मनोज कुमार सिंह	सह-प्राध्यापक, उद्यान विभाग
28.	डा० डी. एस. साहू	सह-प्राध्यापक, पशुपालन विभाग
29.	डा० दान सिंह	सह-प्राध्यापक, कृषि प्रसार विभाग
30.	डा० मुकेश कुमार	प्राध्यापक, सस्य विज्ञान विभाग
31.	डा० अतर सिंह	सहा० प्राध्यापक, आनुवांशिकी एवं पादप प्रजनन विभाग
32.	डा० यू० पी० शाही	सह-प्राध्यापक, मृदा विज्ञान विभाग
33.	डा० आदेश सिंह	सहा० प्राध्यापक, सस्य विज्ञान विभाग
34.	डा० एस० पी० यादव	प्राध्यापक, पशुपालन विभाग
35.	डा० नाजिम अली	प्राध्यापक, पशुपालन विभाग
36.	डा० बी.पी. ध्यानी	प्राध्यापक, मृदा विज्ञान विभाग
37.	डा० विनीता वर्मा	सह-प्राध्यापक, मौलिक विज्ञान विभाग
38.	डा० वैशाली	सह-प्राध्यापक, कृषि जैव प्रौद्योगिकी विभाग
39.	डा० भीम सिंह	सह-प्राध्यापक, मौलिक विज्ञान विभाग
40.	डा० प्रेरणा शर्मा	सह-प्राध्यापक, मौलिक विज्ञान विभाग

धन्यवाद प्रस्ताव के बाद सभा को विधिवत समाप्त किया गया।

(डी. वी. सिंह)

सचिव, कृषि संकाय परिषद

11.8.22

(विवेक)

अध्यक्ष, कृषि संकाय परिषद

प्रतिलिपि:

1. समस्त विभागाध्यक्षों को इस आशय के साथ कि उपरोक्त कार्यवाही दिनांक 20.08.2022 तक करना सुनिश्चित करे।
2. कुलसचिव।
3. अधिष्ठाता स्नातकोत्तर।
4. अधिष्ठाता छात्र कल्याण।
5. कुलपति जी के निजी सहायक को मा० कुलपति जी के अवलोकनार्थ।

कार्यालय अधिष्ठाता कृषि महाविद्यालय

पत्रांक: सवप/अधि0कृषि./5947 /2022
दिनांक:

25-8-2022

कुलसचिव/सचिव विद्वत परिषद
सवप. कृषि एवं प्रौद्योगिक विश्वविद्यालय, मेरठ

कुलसचिव कार्यालय के पत्रांक संख्या सवप/2022/कु0स0/11250, दिनांक 23-08-2022 के क्रम में कृषि महाविद्यालय में दिनांक 04-08-2022 को BOAF की बैठक आयोजित की गयी थी, जिसमें निम्न पाठ्यक्रमों में संशोधन पर सहमति हुई, इस सम्बन्ध में लिया गया निर्णय माननीय विद्वत परिषद की आगामी बैठक में सम्मिलित करने हेतु प्रेषित है-

एजेण्डा-1: स्नातक कृषि छात्रों के पाठ्यक्रम में रोजगार परख (Employability), मूल्य संवर्धक (Value added) एवं स्थानीय, क्षेत्रीय आवश्यकतानुसार संशोधन

Course Code	Discipline/Course title	Credit Hrs
Agronomy		
AGR-111	Fundamentals of Agronomy	4(3+1)
AGR-112	Introduction to Forestry	2(1+1)
AGR-121	Fundamentals of Crop Physiology	2(1+1)
AGR-211	Environmental Studies & Disaster Management	3(2+1)
AGR-212	Crop Production Technology-I (Kharif crops)	3(2+1)
AGR-221	Crop Production Technology II (Rabi crops)	3(2+1)
AGR-223	Farming System & Sustainable Agriculture	1(1+0)
AGR-224	Introductory Agro-meteorology & Climate Change	2(1+1)
AGR-311	Geoinformatics and Nanotechnology and Precision Farming	2(1+1)
AGR-321	Rainfed Agriculture & Watershed Management	2(1+1)
AGR-322	Practical Crop Production - II (Rabi crops)	2(0+2)
AGR-323	Principles of Organic Farming	2(1+1)
Genetics & Plant Breeding		
GPB-121	Fundamentals of Genetics	3(2+1)
GPB-211	Fundamentals of Plant Breeding	3(2+1)
GPB-221	Principles of Seed Technology	3(2+1)
GPB-311	Crop Improvement-I (Kharif crops)	2(1+1)
GPB-321	Crop Improvement-II (Rabi crops)	2(1+1)
Agricultural Engineering		
AGE-112	Farm Machinery and Power	2(1+1)
AGE-121	Soil and Water Conservation Engineering	2(1+1)
AGE-222	Renewable Energy and Green Technology	2(1+1)
AGE-322	Post-harvest Management and Value Addition of Fruits and Vegetables	2(1+1)
Soil Science and Agricultural Chemistry		
SAC-111	Fundamentals of Soil Science	3(2+1)
SAC-121	Agricultural Microbiology	2(1+1)
SAC-221	Problematic soils and their Management	2(2+0)
SAC-311	Manures, Fertilizers and Soil Fertility Management	3(2+1)

2022-23

BK Laksh

Restructured and Revised Syllabi of Post-graduate Programmes

The meeting was called to take decision and finalization of Restructured and Revised Syllabi of Post-graduation Programmes. The following members were present.

- | | |
|---------------------|----------------------------|
| 1. Dr. Vivek | Professor & Head, Agronomy |
| 2. Dr. R.K. Naresh | Professor, Agronomy |
| 3. Dr. R.B. Yadav | Professor, Agronomy |
| 4. Dr. Mukesh Kumar | Professor, Agronomy |
| 5. Dr. Adesh Singh | Asstt., Prof., Agronomy |

1. The Course of M.Sc. (Ag.) Major are as follows

S. No.	Name of Course	Code	Credits
(A) Core Courses (Compulsory)			
✓1	Modern Concepts of Crop Production		Min. 20
✓2	Principles and practices of soil fertility and nutrient management	*AGRON 501	3 + 0
✓3	Principles and practices of weed management	*AGRON 502	2 + 1
✓4	Principles and practices of water management	*AGRON 503	2 + 1
5	Conservation Agriculture	*AGRON 504	2 + 1
6	Agronomy of major cereals & pulses	AGRON 505	1 + 1
7	Agronomy of oilseed, fiber & sugar crops	AGRON 506	2 + 1
8	Agronomy of fodder & forage crops	AGRON 507	2 + 1
9	Principles and practices of organic farming	AGRON 509	2 + 1
		AGRON 513	2 + 1
(B) Minor Courses: To be decided by respective department			
(B1) Minor Courses: For the students of other department			
1	Modern Concept of Crop Production		Min. 8
2	Principles and practices of soil fertility and nutrient management	*AGRON 501	3 + 0
3	Principles and practices of weed management	*AGRON 502	2 + 1
4	Principles and practices of water management	*AGRON 503	2 + 1
		*AGRON 504	2 + 1
(C) Basic Supporting Courses			
1	Statistical Methods for Applied Sciences	STAT-502	Min. 6
2	Experimental Designs	STAT-511	3 + 1
3	Data Analysis Using Statistical Packages	STAT-522	2 + 1
4	Introduction to Communication Technologies, Computer Networking and Internet	MCA-511	2 + 1
5	Information Technology in Agriculture	MCA-512	1 + 1
(D) Seminar:			
1	Master Seminar		1
(E) Research:			
1	Master Research	AGRON-550	1 + 0
		AGRON-560	30
			30

(F) Non-credit compulsory courses				5
1	Library and information services	PGS-501		0 + 1
2	Technical writing and communications skills	PGS-502		0 + 1
3	Intellectual property and its management in agriculture	PGS-503 (e-course)		1 + 0
4	Basic concepts in laboratory techniques	PGS-504		0 + 1
5	Agricultural research, ethics and rural development programmes	PGS-505 (e-course)		1 + 0
Total				70

** These are the compulsory courses*

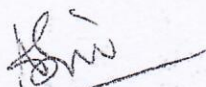
2. The Course of Ph.D. Major are as follows

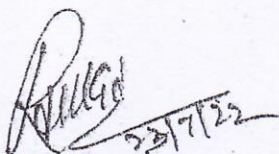
S. No.	Name of Course	Code	Credits
(A) 15 Credits from the below listed courses. In the offered courses at least two courses must be from 600 series.			
			Min. 12
✓1	Current trends in Agronomy	*AGRON 601	3 + 0
2	Recent trends in crop growth and productivity	AGRON 602	2 + 1
3	Irrigation management	AGRON 603	2 + 1
4	Recent trends in weed management	AGRON 604	2 + 0
5	Integrated farming systems for sustainable Agriculture	AGRON 605	2 + 0
6	Soil Conservation and Watershed Management	AGRON 606	2 + 1
✓7	Research and Publication ethics	*AGRON 608	2 + 0
(B) Minor Courses: To be decided by respective department			
(B1) Minor Courses: For the students of other department			8
			Min. 8
1	Modern Concept of Crop Production	*AGRON 501	3 + 0
2	Principles and practices of soil fertility and nutrient management	*AGRON 502	2 + 1
3	Current trends in Agronomy	*AGRON 601	3 + 0
4	Irrigation management	AGRON 603	2 + 1
5	Recent trends in weed management	AGRON 604	2 + 0
6	Integrated Farming System and Sustainable Agriculture	AGRON 605	2 + 1
Note: AGRON-501 & 502 is pre requisite, if it is not study during M.Sc. and AGRON-605			
(C) Basic Supporting Courses			
			Min. 6
1	Experimental Designs	STAT-511	2 + 1
2	Data Analysis Using Statistical Packages	STAT-522	2 + 1
3	Introduction to Communication Technologies, Computer Networking and Internet	MCA-511	1 + 1
4	Information Technology in Agriculture	MCA-512	1 + 1
5	Basic Biochemistry	BIOCHEM-501	3 + 1
(D) Seminar			
			2
1	Doctoral Seminar-I	AGRON 691	1
2	Doctoral Seminar-II	AGRON 692	1

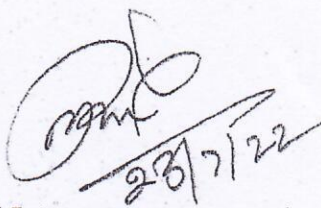
(F) Non credit compulsory courses (if not offered in the master degree programme)			
1	Library and information services	PGS-501	0 + 1
2	Technical writing and communications skills	PGS-502	0 + 1
3	Intellectual property and its management in agriculture	PGS-503 (e-course)	1 + 0
4	Basic concepts in laboratory techniques	PGS-504	0 + 1
5	Agricultural research, ethics and rural development programmes	PGS-505 (e-course)	1 + 0
Total			Min. 100

T.A. ship will be taken from the departmental students as per guidelines of education division ICAR, New Delhi

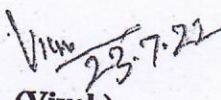
The meeting was ended with the vote of thanks


(Adesh Singh)


(R.B. Yadav)


(Mukesh Kumar)


(R.K. Naresh)


(Vivek)



सरदार वल्लभभाई पटेल कृषि एवं प्रौद्योगिक विश्वविद्यालय,
मेरठ-२५०११०

पत्रांक: संवत् २०२२ / चक्र-१० / ११२५०
दिनांक २३-०८-२०२२

समस्त अधिष्ठातागण
समस्त निदेशकगण
वित्त नियंत्रक

कृपया अवगत कराना है कि माननीय विद्वत् परिषद की आगामी बैठक दिनांक २९.०८.२०२२ को आयोजित किया जाना प्रस्तावित है। अतः उक्त के सदर्भ में आप सभी से अनुरोध है कि अपने-अपने विभाग में सम्बन्धित एजेण्डा माननीय विद्वत् परिषद के विचारार्थ प्रस्तुत किये जाने हेतु दिनांक २६.०८.२०२२ सायंकाल ५.०० बजे तक अनिवार्य रूप से अधोहस्ताक्षरी कार्यालय में उपलब्ध कराने का कष्ट करें ताकि अग्रिम कार्यवाही की जा सके।

कुलसचिव

प्रतिलिपि: निजी सहायक को माननीय कुलपति जी के संज्ञानार्थ प्रेषित।

कार्यालय अधिष्ठाता कृषि महाविद्यालय

पत्रांक: सवप/अधि0कृषि./ 6005/2022
दिनांक:

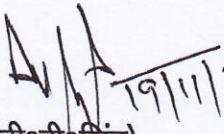
19.11.2022


कुलसचिव/सचिव विद्वत परिषद
स.व.प.कृषि एवं प्रौद्योगिक विश्वविद्यालय, मेरठ

कृपया कुलसचिव कार्यालय के पत्रांक सं0 सवप/2022/कु0स0/11350, दिनांक 05-11-2022 के क्रम में कृषि महाविद्यालय के समस्त विभागाध्यक्षों एवं शिक्षकों द्वारा अनुरोध किया गया है कि कृषि महाविद्यालय की फाईनल परीक्षा के मूल्यांकन हेतु मानदेय के सम्बन्ध में एजेण्डा मा0 विद्वत परिषद में प्रस्तुत किया जाये। इस प्रकार की व्यवस्था अन्य विश्वविद्यालयों में भी संचालित है। जिसके अनुसार सेमेस्टर फाईनल परीक्षा की उत्तर पुस्तिकाओं के मूल्यांकन हेतु निम्न व्यवस्था प्रस्तावित है—


1. स्नातक की उत्तर पुस्तिकाओं के मूल्यांकन हेतु 15.0 रु0 प्रति उत्तर पुस्तिका मानदेय दिया जाये।
2. परास्नातक की उत्तर पुस्तिकाओं के मूल्यांकन हेतु 20.0 रु0 प्रति उत्तर पुस्तिका मानदेय दिया जाये।

संलग्नक: विभागाध्यक्षों के द्वारा मानदेय के सम्बन्ध में प्रस्तुत अनुरोध पत्र।


(डी0वी0सिंह)
सचिव, कृषि संकाय


(विवेक)
अध्यक्ष, कृषि संकाय

Forwarded for Consideration


19.11.22

कार्यालय अधिष्ठाता कृषि महाविद्यालय

पत्रांक: सवप/अधि0कृ0/2022/5931
दिनांक: 30-7-2022

सूचना

कृषि महाविद्यालय के सभी शिक्षकों/वैज्ञानिकों/अधिकारियों को सूचित किया जाता है कि दिनांक 04.08.2022 को सांय 4 बजे कृषि महाविद्यालय के आडिटोरियम में निम्न विषयों पर विचार विमर्श हेतु एक बैठक आहूत की जायेगी।

1. स्नातक कृषि छात्रों के पाठ्यक्रम में रोजगार परख (Employability), मूल्य संवर्धक (Value added) एवं स्थानीय, क्षेत्रीय आवश्यकतानुसार विषयों में संशोधन किये जाने पर विचार।
2. BSMA के अनुसार स्नातकोत्तर पाठ्यक्रमों में स्थानीय, क्षेत्रीय आवश्यकतानुसार विषयों में संशोधन एवं समायोजन।
3. कृषि स्नातक पाठ्यक्रम में ELP को लाभप्रद बनाने हेतु विचार।
4. कृषि स्नातक पाठ्यक्रम में Organic Farming विषय के साथ Natural Farming विषय का समायोजन करने पर विचार।
5. कृषि संकाय के सचिव का मनोनयन/चयन।
6. अन्य प्रस्ताव अध्यक्ष की अनुमति से।

R
(राज कुमार) 30/7/22
सचिव कृषि संकाय

प्रतिलिपि:

- समस्त विभागाध्यक्षों को इस आशय से प्रेषित कि अपने विभाग के सभी शिक्षकों की उपस्थिति सुनिश्चित करें।
- कुलसचिव।
- अधिष्ठाता स्नातकोत्तर
- कुलपति के निजी सहायक को मा0 कुलपति जी के अवलोकनार्थ।

**Proceeding of HOD/OIC meeting
College of Veterinary and Animal Sciences**

A HOD/OIC meeting of COVAS was held on 02/08/2022 at committee hall of COVAS, SVPUAT, Meerut under the chairmanship of Dr. Vijay Singh, Dean, COVAS. Following HODs/OICs, were present in that meeting:

1. Dr. Vijay Singh, Dean, COVAS
2. Dr. Tarun Kr Sarkar, Professor & Head, Veterinary Medicine
3. Dr. Rajeev Singh, Professor & Head, Veterinary Microbiology
4. Dr. Amit Kumar, Professor & Head, LPM
5. Dr. V.P. Singh, Assoc. Prof. & OIC, Livestock Product Technology
6. Dr. Vivek Mailk, Assoc. Prof. & OIC, Veterinary Surgery & Radiology
7. Dr. Prabhakar Kumar, Assoc. Prof. & OIC, Veterinary Anatomy
8. Dr. Mohd Ameer Khan, Assoc. Prof. & OIC, AHE
9. Dr. Kuldeep Tyagi, Assoc. Prof. & OIC, AGB
10. Dr. R K Singh, Assoc. Prof. & OIC, Veterinary Physiology and Biochemistry
11. Dr. Rajesh Mandil, Assoc. Prof., Veterinary Pharmacology & Toxicology
12. Dr. P. S. Maurya, Asstt. Prof. & OIC, Veterinary Parasitology
13. Dr. Shriya Rawat, Assistant Professor & OIC, VPH
14. Dr. Vikas Jaiswal, Assistant Professor & OIC, Veterinary Pathology
15. Dr. Debashis Roy, Assoc. Prof. & OIC, ANN & Faculty Secretary, COVAS

SVPUAT, Meerut
Dean, Veterinary office
Disp. No. 5266
Date 03/08/2022

Dean, COVAS welcomed all the faculty members. He informed the faculty regarding new guidelines by ICAR for PG and PhD courses. The instructions which were given thereafter are as follows:

- 1) **Regarding revision of new guidelines by ICAR:** All the HODs/OICs were instructed to discuss with their departmental faculty members regarding any modifications required in new ICAR guidelines for PG and PhD courses. Accordingly, modification list along with the original course content are to be submitted to Academic Coordinator on or before 04/08/2022 (both hard and soft copies). A copy of departmental meeting proceeding is also to be attached with it.
- 2) **Regarding modification of old ICAR syllabus:** All the HODs/OICs were also instructed to submit the list of new courses formulated or any modification done in old ICAR syllabus when PG and PhD program were started in the department to Academic Coordinator on or before 04/08/2022. This is required for NAAC accreditation of the University.

The meeting was ended with vote of thanks.

D2 2/8/22
(Debashis Roy)
Faculty Secretary

N. Singh
(Vijay Singh)
Dean, COVAS

CC:-

- 1) PA to Hon'ble Vice Chancellor for kind information
- 2) Registrar

Department of Veterinary and Animal Husbandry Extension Education
College of Veterinary and Animal Sciences, SVPUA&T, Meerut (U.P.)

No.AHE/COVAS/2020/ 130

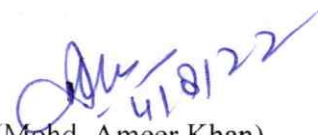
Dt.: 04/08/2022

To

The Academic Co-ordinator
COVAS, SVPUAT
Meerut , 250 110

Sir,

The course curriculum & syllabus to start PG and Ph.D. degree programme in Veterinary and Animal Husbandry Extension Education was in accordance to the New and Restructured post graduate Curricula & Syllabi of ICAR (2009) with introduction of two new courses at the M.V.Sc level.


(Mohd. Ameer Khan)

Assoc. Prof. & H.O.C.

Assoc. Prof. & H.O.C.
Deptt. of Vety & A.H. Ext. Edu.
COVAS, SVPUAT, Meerut (U.P.) 250110

Department of Veterinary and A.H. Extension Education

A. Major: Veterinary and Animal Husbandry Extension Education (Minimum -29 Credit Hours)

S.No.	Course Title	Code	Credit Hrs
Core Courses			
1	Fundamentals of Veterinary and Animal Husbandry Extension	AHE 601	2+1
2	Communication for Livestock Development	AHE 602	1+1
3	Diffusion and Adoption of Animal Husbandry Practices	AHE 603	2+1
4	Extension Techniques and Audio Visual Aids	AHE 604	2+1
5	Animal Husbandry Programme Planning and Evaluation	AHE 605	2+1
6	Research Methodology in Veterinary and Animal Husbandry Extension	AHE 606	2+1
7	Social Psychology and Group Dynamics	AHE 607	2+1
8	Animal Husbandry Development Programmes	AHE 608	1+0
9	Developments in the Concept of Extension	AHE 609	1+0
10	Gender and Livestock Development	AHE 611	1+0
11	Master's Seminar	AHE 691	1+0
Optional Courses			
1	Human Resource Management in Animal Husbandry Sector	AHE 610	2+1
2	Information and Communication Technology in Livestock Development	AHE 612	1+1
3	Livestock Entrepreneurship (New Course)	AHE 613	2+1
4	Farm Journalism (New Course)	AHE 614	2+1

B. Minor (Minimum 6-8 Credit Hours)

a. Prescribed Minor Subjects

Animal Nutrition, Animal Genetics & Breeding, Animal Reproduction, Gynaecology and Obstetrics, Livestock Production and Management, Veterinary Public Health, Veterinary Epidemiology and Preventive Medicine

b. List of Courses for Minor in Department of Veterinary and Animal Husbandry Extension Education

S.No.	Course Title	Code	Credit Hrs
Core Courses			
1	Fundamentals of Veterinary and Animal Husbandry Extension	AHE 601	2+1
2	Animal Husbandry Development Programmes	AHE 608	1+0
Optional Courses			
Other courses offered by the Department will be opted as per need of student and on the recommendation of advisory committee			

C. Basic Supporting Courses (Minimum 3-5 Credit Hours)

S.No.	Course Title	Code	Credit Hrs
Core Courses			
1.	Experimental Design	STAT-512	3 (2+1)
Optional Courses			
Other courses will be offered to the student as per the need of the programme.			

D. Deficiency Courses (As per the need of student on the recommendation of advisory committee)

S.No.	Course Title	Code	Credit Hrs
Student can opt any course from the courses offering in university.			

VETERINARY PHARMACOLOGY & TOXICOLOGY

A. Major –Subject Veterinary Pharmacology & Toxicology (Minimum -29 Credit Hours)

S.No.	Course Title	Code	Credit Hrs
Core Courses			
1.	✓ General Pharmacology	VPT-601	2 (2+0)
2.	✓ Autonomic and Autacoid Pharmacology	VPT-602	3 (2+1)
3.	✗ CNS Pharmacology	VPT-603	3 (2+1)
4.	✓ Digestive and Respiratory Pharmacology	VPT-604	2 (2+0)
5.	✓ Cardiovascular and Renal Pharmacology	VPT-605	2 (2+0)
6.	✗ Endocrine and Reproductive Pharmacology	VPT-606	2 (2+0)
7.	✓ Chemotherapy	VPT-607	3 (2+1)
8.	✓ Toxicology of Xenobiotics	VPT-608	3 (2+1)
9.	✗ Toxicology of Plants And Toxins	VPT 609	2 (2+0)
10.	✗ Pharmacological Techniques	VPT-610	2 (1+1)
11.	✓ Techniques in Toxicology	VPT-611	2 (1+1)
12.	✓ Ethnopharmacology	VPT-612	2 (2+0)
13.	✗ Master's Seminar	VPT-691	1 (1+0)
Optional Courses			
1	Production Pharmacology	VPT-613	2(2+0)
2	Drug Regulatory Affairs And Intellectual Property Rights	VPT-614	2(2+0)
3	Target Organ Toxicity	VPT-615	2(2+0)
4	Pharmacogenomics (To be taught jointly with Veterinary Physiology & Biochemistry)	VPT/VPB-616	2(2+0)
5	Pharmacoinformatic (To be taught jointly with Veterinary Physiology & Biochemistry)	VPT/VPB-617	2(2+0)

B. Minor (Minimum 6-8 Credit Hours)

a. Prescribed Minor Subjects

Veterinary Physiology, Veterinary Biochemistry, Veterinary Clinical Medicine, Ethics & Jurisprudence, Veterinary Pathology

b. List of Courses for Minor in Department of Veterinary Pharmacology & Toxicology.

S.No.	Course Title	Code	Credit Hrs
Core Courses			
1	Chemotherapy	VPT-607	2+1=3
2	Toxicology of Xenobiotics	VPT-608	(2+1) 3
Optional Courses			
1	General Pharmacology	VPT-601	(2+0) 2
2	CNS Pharmacology	VPT-603	2+1=3
3	Pharmacological Techniques	VPT-610	1+1=2
4	Techniques In Toxicology	VPT-611	1+1=2

C. Basic Supporting Courses (Minimum 3-5 Credit Hours)

S.No.	Course Title	Code	Credit Hrs
Core Courses			
1.	Experimental Design	STAT-512	3 (2+1)
Optional Courses			
Will be selected as per the research problem and recommendation of advisory committee			

D. Deficiency Courses (As per the need of student on the recommendation of advisory committee)

S.No.	Course Title	Code	Credit Hrs
Student can opt any course from the courses offering in university.			

E. Non Credit Compulsory Courses (Any four courses, minimum of 4 Credit Hrs)

S.No.	Course Title	Code	Credit Hrs
1.	Library and Information Services	PGS 501	1(0+1)
2.	Technical writing and communications skills	PGS 502	1(0+1)
3.	Intellectual Property and its management	PGS 503	1(1+0)
4.	Basic Concepts in Laboratory Techniques	PGS 504	1(0+1)
5.	Agriculture research, Research Ethics and Rural development Programmes	PGS 505	1(1+0)
6.	Disaster management	PGS 506	1(1+0)

F. Master's Thesis Research

S.No.	Course Title	Code	Credit Hrs
1.	Master's Research	VPT-699	20 (0+20)

Total Credit Hours=29+11+20 =60

VETERINARY PHARMACOLOGY AND TOXICOLOGY

VPT 601 General Pharmacology

2+0

Objective: To study the scope of pharmacology and to understand the basic mechanisms of drug actions and its effects.

Theory

Unit I: History and scope of pharmacology, Principles of drug absorption, distribution, metabolism and elimination. Drug bioavailability and routes of administration.

Unit II: Important pharmacokinetic parameters and their clinical significance.

Unit III: Pharmacodynamics: mechanism of action and the relationship between drug concentration and effect; signal transduction mechanism and drug receptors for physiological regulatory molecules.

Unit IV: Quantitation of drug-receptor interactions and elicited effects. Competitive and non-competitive antagonism. Factors affecting drug response. Adverse drug reactions.

Suggested Readings

Brunton LL. (Ed). 2005. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 11th Ed. McGraw-Hill.

Richard AH. (Ed). 2001. Veterinary Pharmacology and Therapeutics. 8th Ed. Iowa State Univ. Press.

Sandhu HS & Rampal S. 2006. Essentials of Veterinary Pharmacology and Therapeutics. 1st Ed. Kalyani Publishers.

VPT 602 Autonomic and Autacoid Pharmacology

2+1

Objective: To study the pharmacodynamics of autonomic drugs.

Theory

Unit I: Anatomical and physiological considerations of autonomic nervous system (ANS).

Unit II: Neurohumoral transmission in ANS.

Unit III: Pharmacology of cholinergic agonists and antagonists.

Unit IV: Pharmacology of adrenergic agonists and antagonists.

Unit V: Ganglionic stimulants and blockers.

Unit VI: Autacoids: Histamine, serotonin, kinins, eicosanoids and platelet activating factor.

Practical

Pharmacological experiments on intact and isolated preparations for studying the effects of various prototype drugs on vascular, intestinal, respiratory, urinary and reproductive smooth muscles, autonomic ganglia, skeletal muscles; blood pressure, ECG, heart etc.

Suggested Readings

Brunton LL. (Ed). 2005. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 11th Ed. McGraw-Hill.

Richard AH. (Ed). 2001. Veterinary Pharmacology and Therapeutics. 8th Ed. Iowa State Univ. Press.

Sandhu HS & Rampal S. 2006. Essentials of Veterinary Pharmacology and Therapeutics. 1st Ed. Kalyani Publishers.

VPT 603 CNS Pharmacology

2+1

Objective: To study the pharmacodynamics of drugs acting on CNS.

Theory

Unit I: Anatomical and physiological considerations of central nervous system (CNS); neurohumoral transmission in CNS.

Unit II: Historical development, theories, principles and stages of general anaesthesia.

Unit III: Pharmacology of anaesthetics, sedatives, hypnotics, neuroleptics, antiepileptics.

Unit IV: CNS stimulants, analeptics, opioid agonists and antagonists; non-steroidal anti-inflammatory agents, central and peripheral muscle relaxants, local anaesthetics, therapeutic gases, euthanizing agents, Doping.

Practical

Study of pharmacodynamics of prototype drugs of each group in experimental animals. *Suggested Readings*

Brunton LL. (Ed). 2005. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 11th Ed. McGraw-Hill.

Richard AH. (Ed). 2001. Veterinary Pharmacology and Therapeutics. 8th Ed. Iowa State Univ. Press.

Sandhu HS & Rampal S. 2006. Essentials of Veterinary Pharmacology and Therapeutics. 1st Ed. Kalyani Publishers.

VPT 604 Digestive and Respiratory Pharmacology 2+0

Objective: To study the pharmacological aspects of drugs acting on digestive and respiratory systems.

Theory

Unit I: Pharmacology of drugs acting on gastrointestinal tract. Appetite stimulants, emetics and anti-emetics.

Unit II: Anti-ulcer drugs, modulators of gastric and intestinal motility and secretions.

Unit III: Gastrointestinal protectants and adsorbents, laxatives and cathartics.

Unit IV: Agents promoting digestive functions; bile acids and pancreatic enzymes, drugs affecting liver; rumen pharmacology.

Unit V: Pharmacology of drugs acting on respiratory system: pathogenesis of inflammatory respiratory diseases.

Unit VI: Bronchodilators, antitussives, mucolytics, expectorants, decongestants.

Unit VII: Drugs used in treatment of asthma.

Suggested Readings

Brunton LL. (Ed). 2005. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 11th Ed. McGraw-Hill.

Richard AH. (Ed). 2001. Veterinary Pharmacology and Therapeutics. 8th Ed. Iowa State Univ. Press.

Sandhu HS & Rampal S. 2006. Essentials of Veterinary Pharmacology and Therapeutics. 1st Ed. Kalyani Publishers.

VPT 605 Cardiovascular and Renal Pharmacology 2+0

Objective: To study the pharmacological aspects of drugs acting on CVS and kidneys.

Theory

Unit I: Pharmacology of cardiac glycosides.

Unit II: Antiarrhythmic, antihypertensive and antihyperlipidaemic drugs.

Unit III: Drugs affecting vasomotor and cardiorespiratory reflex mechanisms and haemopoietic system.

Unit IV: Coagulants and anticoagulants, thrombolytic agents.

Unit V: Pharmacology of drugs affecting renal functions and fluid-electrolyte balance.

Unit VI: Fluid and electrolyte therapy, diuretics, antidiuretics, uricosuric drugs.

Suggested Readings

Brunton LL. (Ed). 2005. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 11th Ed. McGraw-Hill.

Richard AH. (Ed). 2001. Veterinary Pharmacology and Therapeutics. 8th Ed. Iowa State Univ. Press.

Sandhu HS & Rampal S. 2006. Essentials of Veterinary Pharmacology and Therapeutics. 1st Ed. Kalyani Publishers.

VPT 606 Endocrine and Reproductive Pharmacology 2+0

Objective: To study the pharmacology of drugs affecting endocrine functions.

Theory

Unit I: Pharmacology of drugs affecting endocrine functions of pituitary, thyroid, adrenals and pancreas.

Unit II: Hormonal regulation of calcium and phosphorus homeostasis.

Unit III: Pharmacology of drugs affecting male reproductive organs, spermatogenesis.

Unit IV: Pharmacology of drugs affecting female reproductive organs, ovulation, oestrus, conception, gestation and lactation.

Unit V: Oxytocic and tocolytic drugs.

Suggested Readings

Brunton LL. (Ed). 2005. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 11th Ed. McGraw-Hill.

Richard AH. (Ed). 2001. Veterinary Pharmacology and Therapeutics. 8th Ed. Iowa State Univ. Press.

Sandhu HS & Rampal S. 2006. Essentials of Veterinary Pharmacology and Therapeutics. 1st Ed. Kalyani Publishers.

VPT 607 Chemotherapy**2+1**

Objective: To study the recent advances of chemotherapeutic agents with relevance to pharmacological and therapeutic aspects.

Theory

Unit I: General consideration and principles of chemotherapy, classification of chemotherapeutic agents; development of microbial resistance to antimicrobials, combination therapy.

Unit II: Systemic and gut acting sulfonamides, diaminopyrimidines, quinolones sulfones, nitrofurans.

Unit III: Penicillins, cephalosporins, beta-lactam antibiotics.

Unit IV: Chloramphenicol, tetracyclines, macrolides, polymyxins, polypeptides.

Unit V: Aminoglycosides and other antibiotics.

Unit VI: Anti-protozoans, anthelmintics, ectoparasiticides.

Unit VII: Antituberculosis, antifungal, antiviral and antineoplastic drugs.

Practical

General methods for assay of chemotherapeutic agents, antibiotic sensitivity tests, estimation of sulfonamides, penicillins, oxytetracyclines, trimethoprim and nitrofurans in biological fluids to study their kinetics and bioavailability.

Suggested Readings

Brunton LL. (Ed). 2005. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 11th Ed. McGraw-Hill.

Richard AH. (Ed). 2001. Veterinary Pharmacology and Therapeutics. 8th Ed. Iowa State Univ. Press.

Sandhu HS & Rampal S. 2006. Essentials of Veterinary Pharmacology and Therapeutics. 1st Ed. Kalyani Publishers.

VPT 608 Toxicology of Xenobiotics**2+1**

Objective: To study the poisonings and their antidotal therapy in animals.

Theory

Unit I: Principles and scope of toxicology, sources of poisoning.

Unit II: General modes of action of poisons, detoxification, factors affecting toxicity, general principles of diagnosis and treatment of poisonings.

Unit III: Toxicology of metals, agrochemicals, solvents and vapors, feed additives.

Unit IV: Toxic effects of radiations and radioactive chemicals, genetic and developmental toxicology; forensic and regulatory aspects of toxicology.

Practical

Extraction, separation and detection of common poisons in toxicological specimens, study of toxicity and antidotal treatment in animals, designing of animal toxicity experiments and general toxicity tests.

Suggested Readings

Klassen CD, Amdure MO & Doull J. (Eds). 1996. Casarett & Doull's Toxicology: The Basic Sciences of Poisons. 5th Ed. McGraw Hill.

Sandhu HS & Brar RS. 2000. Text Book of Veterinary Toxicology. 1st Ed. Kalyani Publishers.

Stive KE & Brown TM. 2006. Principles of Toxicology. 2nd Ed. CRC Press.

VPT 609 Toxicology of Plants And Toxins**2+0**

Objective: To impart knowledge of toxicity of poisonous plants & natural toxins

Theory

Unit I: Classification, identification and chemical constituents of poisonous plants. Plants containing cyanide, nitrate/nitrite, oxalate, lectins and cardiotoxic glycosides.

Unit II: Plants producing lathyrism, thiamine deficiency and photosensitization.

Unit III: Toxicology of mycotoxins: aflatoxins, rubratoxins, ochratoxins, trichothecenes, tremorgens and ergot.

Unit IV: Animal bites and stings: snake venom, scorpion, spider and insect stings and toad poisoning. Bacterial toxins: botulism.

Suggested Readings

Chopra SR, Badhwar RL & Ghosh S. 1984. Poisonous Plants of India. 1st Ed., Academic Publishers, Jaipur.

Klassen CD, Amdure MO & Doull J. (Eds). 1996. Casarett & Doull's Toxicology: Basic Sciences of Poisons. 5th Ed., McGraw Hill.

Sandhu HS and Brar RS. 2000. Text Book of Veterinary Toxicology. 1st Ed., Kalyani Publishers.

VPT 610 Pharmacological Techniques**1+1**

Objective: To impart the knowledge of various basic pharmacological techniques and screening methods of drugs.

Theory

Unit I: Principles of drug action and bioassay. Dose response curves and their analysis.

Unit II: Techniques for setting up isolated and intact preparations.

Unit III: Organization of screening programme of drugs; multidimensional screening procedures and gross observational methods.

Practical

Setting up of isolated and intact preparations, recording of BP in dog/rat, recording of ECG in rat, experiments on drug potentiation, antagonism and tachyphylaxis. Construction of dose-response plots, calculation of EC₅₀, dissociation rate constants, potency ratio, pA_x, pD_x and pD'_x values. Specific tests for evaluation of tranquillizing, hypnotic, analgesic, anticonvulsant, general and local anesthetic, muscle relaxant, antiinflammatory, antipyretic, antiarrhythmic, antihypertensive, antihyperglycemic and anticholesterimic activities. Determination of potency ratio, median effective, toxic or lethal doses. Bioassay techniques. *Suggested Readings*

Ghosh MN. (Ed). 2005. Fundamentals of Experimental Pharmacology. 3rd Ed. Hilton & Co. Kulkarni SK (Ed). 2004. Handbook of Experimental Pharmacology. 3rd Ed. Vallabh Prakashan.

Laurance DR & Bacharach AL. (Ed). 1964. Evaluation of Drug Activities: Pharmacometrics. Vols. I, II. Academic Press.

Parmar NS & Shiv Prakash 2006. Screening Methods in Pharmacology. 1st Ed. Narosa.

Seth UK, Dadkar NK & Usha G Kamat (Eds). 1972. Selected Topics in Experimental Pharmacology. 1st Ed. Kothari Book Depot.

Tallarida RJ & Murray RB. 1987. Manual of Pharmacologic Calculations. 2nd Ed. Springer Verlag.

VPT 611 Techniques in Toxicology**1+1**

Objective: To understand the animal toxicity tests and assessment of various toxicants using specific tests.

Theory

Unit I: Animal models in toxicological studies.

Unit II: Animal toxicity tests for acute, sub-acute and chronic toxicity.

Unit III: Specific toxicity tests for neurotoxicity, immunotoxicity, developmental, behavioural, reproductive and inhalation toxicity, mutagenicity, carcinogenicity.

Unit IV: Animal toxicological tests for the study of metabolism, synergism and antagonism.

Practical

Tests for acute, sub-acute and chronic toxicity, protocols and various specific toxicity tests. Assay for marker enzymes, analysis of toxicant residues in biological materials.

Suggested Readings

Derelanko MJ. 1995. CRC Hand Book of Toxicology. Mannfred A. Holinger.

Gad SC & Chengelis CP. 1998. Acute Toxicology Testing. 2nd Ed. Academic Press.

Hayes AW. 1994. Principles and Methods of Toxicology. 3rd Ed. Raven Press.

VPT 612 Ethnopharmacology**2+0**

Objective: To impart the knowledge and importance of traditional Indian medicine.

Theory

Unit I: Historical aspects: Traditional Indian remedies and regional folklore in disease cure.

Unit II: Classification, identification and chemical constituents of medicinal plants. Extraction, distillation, evaporation and other processes used in purification and preparation of active constituents from medicinal plants.

Unit III: Standardization and clinical validation of bioactive molecules from vegetable sources. Therapeutic and adverse effects of potential herbal drugs. Indigenous drugs used as carminatives, antiseptics, antimicrobials, analgesics, and anti-inflammatory agents.

Unit IV: Alternate systems of medicine in animals.

Suggested Readings

Agrawal VS. (Ed). 1997. Drug Plants of India. Kalyani Publishers.

Anjaria J. 2002. Inventory of Traditional Veterinary Medicinal Practices in India. GOI Publ., Pathik Enterprises, Ahmedabad.

- Bisset NG. (Ed). 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press.
- Chopra RN, Nayar SL & Chopra IC. (Eds.). 2002. Glossary of Indian Medicinal Plants. NISCAIR, CSIR, New Delhi.
- Pushpangadan P, Nyman U & George V. (Eds). 1995. Glimpses of Indian Ethnopharmacology. TBGRI Publication.
- Rastogi RP & Mehrotra BN (Eds). 1993-95. Compendium of Indian Medicinal Plants. Vols. I-IV. Publication and Information Directorate, New Delhi.
- Tallarida RJ & Murray RB. 1987. Manual of Pharmacologic Calculations. 2nd Ed. Springer Verlag.

VPT-613 Production Pharmacology

2+0

Objective: To impart the knowledge regarding sources of medicinal components of various drugs.

Theory

Unit I: Introduction, growth promoters including- antimicrobials, ionophores, hormones, repartitioning agents and probiotics.

Unit II: Neutraceuticals in animal production. Possible consumer concerns of growth promoting agents.

Unit III: Drug and food interactions, Gene therapy.

Unit IV: Drugs used in synchronization of oestrus and induction of superovulation.

Unit V: Role of biotechnology in Pharmacology. Bio-technology-derived therapeutic agents.

Suggestive readings:

Goodman and Gilman's The Pharmacological Basis of Therapeutics, 13th Edition

Relevant websites.

VPT-614 Drug Regulatory Affairs & Intellectual Property rights

2+0

Objective: To import knowledge and information on drug regulatory affairs and intellectual property rights

Theory

Unit I: Drug and Cosmetics Acts, rules with special reference to schedule Y & M, Drug Regulatory Affairs. Requirements of cGMP, GLP, GCP, USFDA, IND, NDA & ANDA, BA/BE Studies- USFDA, CDSCO & EUDRA guidelines.

Unit II: Intellectual Property Rights Processing & its application (patents, Trademarks, Copyrights), Patents Act, Major emphasis on Patents related to: Patentable subject matter, Non-Patentable subject matter, Criteria for getting a patent, Types of patent and its usefulness, Filing procedure for patents, Patent cooperation treaty: Introduction & their advantage, Trade related aspect of intellectual property rights: Introduction & their advantage. Environment protection Act & Factory Act.

Unit III: Requirements for factory premises for Medical Devices and In-vitro Diagnostic products in India, Concepts in validation, Analytical & Process validation & ISO 9000 Series Basic concepts of Quality Control & quality assurance systems control of quality variation of Raw materials, containers & closures. In process quality control tests, ICH Guidelines-An introduction of [Q1A (R2), Q3A (R2) & Q6A) guidelines.

Unit IV: Biosimilars: An introduction, Fixed dose combination: USFDA Guideline.

Suggestive readings:

Guarino, R.A., New Drug Approval Process, Informa Healthcare, New York.

Drugs & Cosmetic Acts & rules.

Patents Act.

Factory Act.

Consumer Protection Act.

Environmental Protection Act.

Federal Food, Drug & Cosmetic Act.

Loftus, B.T. & Nash RA Pharmaceutical Process Validation, Informa Healthcare, New York.

Sharma PP., Validation in Pharmaceutical industry, Vandana publication pvt. Ltd, Delhi.

Nally JD., Good manufacturing practices for Pharmaceuticals, Informa Healthcare, New York.

Garfield, Quality Assurance Principles for Analytical Laboratories.

Martin RP. And Berry IR., The Pharmaceutical regulatory process, Informa Healthcare, New York.

Relevant websites.

VPT-615 Target organ toxicity

2+0

Objective: To study the toxicological effect of xenobiotics on different systems of animal body

Theory

Unit I: Blood: Toxic effects on hematopoiesis, toxicants induced hypoxia and oxidative hemolysis. Unit II: GIT: Role of GIT in elimination of toxicants, sources and effects of gastrointestinal toxicity, interactions between xenobiotics and gastrointestinal flora.

Unit III: Liver: Types of injury, mechanisms and effects of hepatotoxicity.

Unit IV: Kidney: Susceptibility of kidney to toxic damage, common nephrotoxicants and their mode of action, consequences of their exposure.

Unit V: Lung: Airpollutants and other chemicals producing lung injury and their effects.

Unit VI: Reproductive system: Targets, mechanisms of action and effects of reproductive and developmental toxicants.

Unit VII: Skin: Contact and allergic dermatitis, phototoxicity, skin tumors.

Suggestive readings:

Goodman and Gilman's The Pharmacological Basis of Therapeutics, 13th Edition 13th Edition

Casarett & Doull's Essentials of Toxicology, Third Edition (Lange) 3rd Edition

Relevant websites.

VPT/VPB-616 Pharmacogenomics

2+0

Objective: To impart information on genomics based treatment of various diseases

Theory

Unit I: History, concepts and definitions of Pharmacogenomics, Transcriptomics, Proteomics, Metabolomics.

Unit II: Importance of Pharmacogenetics to variability in drug response.

Unit III: Ethnic diversity, Polymorphism selection. Pharmacogenetic measures, Candidate gene versus genome-wide approaches. Functional studies of polymorphism.

Unit IV: Pharmacogenetic phenotypes, Genetic polymorphism affecting pharmacokinetics, drug targets-receptors, modifying disease-drug response.

Unit V: Pharmacogenomics and drug development, Pharmacogenomics in clinical practice.

Suggestive readings:

Goodman and Gilman's The Pharmacological Basis of Therapeutics, 13th Edition 13th Edition

Lisa B., Combinational Library Methods and

Relevant websites.

VPT/VPB-617 Pharmacoinformatics

2+0

Objective: Study of important drug targets and their variations

Theory

Unit I: General Pharmacoinformatics.

Unit II: Drug Design: Study of important drug targets and their variations; Pharmacophore designing; prediction of ADME properties.

Unit III: Computational tool for toxicity prediction; SAR and QSAR techniques in drug designing; Drug receptor interactions, Structure based drug design; Lipinski's rule in drug design.

Unit IV: Chemogenomics, chemoinformatics, Pimmunoinformatics, cancer informatics, neuroinformatics, toxicoinformatics, Tools used in pharmacoinformatics,

Unit V: Case studies and applied pharmacoinformatics.

Suggestive readings:

Gupta, S.P., 1996. Quantum Biology. New Age.

Malone, P.M., Kier, K.L., Srtanovich, J.E. Drug Information-A Guide for Pharmacists. McGraw-Hill, 2006.

Krishnan Namboori P K and Deepak O M. Computational Drug Design and Delivery systems-principles and applications, Springer. 2012.

GredFolkers, Wolfgang Sippl, Didier Rognan & Hans Dieter, 2003, Molecular Modeling: Basic Principles and applications, Science.

Prasad V. Bharatam, Modeling and Informatics in Drug Design, John Wiley & Sons Inc. 2007.

Tagelsir Mohamed Gasmelseid, Pharmacoinformatics and Drug Discovery Technologies: Theories and Applications, IGI-Global, 2012

VETERINARY CLINICAL MEDICINE, ETHICS AND JURISPRUDENCE

Course Structure – at a Glance

CODE	COURSE TITLE	CREDITS
VCM 601	RUMINANT CLINICAL MEDICINE -I	2+0
VCM 602	RUMINANT CLINICAL MEDICINE -II	2+0
VCM 603	EQUINE CLINICAL MEDICINE	2+0
VCM 604	CANINE AND FELINE CLINICAL MEDICINE	2+0
VCM 605	SWINE CLINICAL MEDICINE	1+0
VCM 606	AVIAN MEDICINE	1+0
VCM 607	ZOO, WILD & LABORATORY ANIMAL MEDICINE	2+0
VCM 608	CLINICAL DISEASES OF ANIMAL SPECIES*OF REGIONAL IMPORTANCE	1+0
VCM 609	PRODUCTION DISEASES	2+0
VCM 610	DISEASES OF ANIMALS CAUSED BY TOXICANTS	1+0
VCM 611	VETERINARY FORENSIC MEDICINE	1+1
VCM 612	CLINICAL DIAGNOSTIC TECHNIQUES	0+2
VCM 613	VETERINARY EMERGENCY MEDICINE	0+2
VCM 614	CLINICAL PRACTICE I	0+3
VCM 615	CLINICAL PRACTICE II	0+3
VCM 691	MASTER'S SEMINAR	1+0
VCM 699	MASTER'S RESEARCH	20
VCM 701	ADVANCES IN GASTROENTROLOGY	2+0
VCM 702	ADVANCES IN CARDIOPULMONARY MEDICINE	2+0
VCM 703	ADVANCES IN NEUROLOGICAL AND UROLOGICAL DISORDERS	2+0
VCM 704	ADVANCES IN ENDOCRINE AND DERMATOLOGICAL DISORDERS	2+0
VCM 705	ADVANCES IN PRODUCTION DISEASES	2+0
VCM 706	ADVANCES IN PAEDIATRICS AND GERIATRICS	1+0
VCM 707	ADVANCES IN VETERINARY DIAGNOSTICS	1+2
VCM 708	ADVANCES IN VETERINARY THERAPEUTICS	1+2
VCM 709	ADVANCED CLINICAL PRACTICE I	0+2
VCM 710	ADVANCED CLINICAL PRACTICE II	0+2
VCM 711	ADVANCED CLINICAL PRACTICE III	0+2
VCM 790	SPECIAL PROBLEM	0+2
VCM 791	DOCTORAL SEMINAR I	1+0
VCM 792	DOCTORAL SEMINAR II	1+0
VCM 799	DOCTORAL RESEARCH	45

*Domestic animals of regional importance e.g. Camel in Haryana, Yak in Eastern India, Elephant in South India

VETERINARY EPIDEMIOLOGY AND PREVENTIVE MEDICINE

Course Structure – at a Glance

CODE	COURSE TITLE	CREDITS
VEP 601	PRINCIPLES OF EPIDEMIOLOGY	2+0
VEP 602	APPLIED EPIDEMIOLOGY	1+1
VEP 603	LIVESTOCK AND POULTRY DISEASE INVESTIGATION	0+2
VEP 604	VETERINARY CLINICAL EPIDEMIOLOGY	1+1
VEP 605	BIOSECURITY PRACTICES IN DISEASE PREVENTION	1+1
VEP 606	INFECTIOUS DISEASES OF RUMINANTS -I	2+1
VEP 607	INFECTIOUS DISEASES OF RUMINANTS -II	2+1
VEP 608	INFECTIOUS DISEASES OF EQUINES	1+1
VEP 609	INFECTIOUS DISEASES OF CANINES AND FELINES	2+1
VEP 610	INFECTIOUS DISEASES OF POULTRY	2+1
VEP 611	INFECTIOUS DISEASES OF ANIMAL SPECIES OF REGIONAL IMPORTANCE	2+1
VEP 612	INFECTIOUS DISEASES OF LABORATORY AND ZOO ANIMALS	1+0
VEP 691	MASTER'S SEMINAR	1+0
VEP 699	MASTER'S RESEARCH	20
VEP 701	RECENT CONCEPTS IN EPIDEMIOLOGY AND DISEASE FORECASTING	2+1
VEP 702	HERD HEALTH MANAGEMENT	2+1
VEP 703	DATA COLLECTION , MANAGEMENT AND PRESENTATION	2+1
VEP 704	SURVEY AND SURVEILLANCE	2+1
VEP 705	EMERGING AND RE-EMERGING ANIMAL DISEASES	2+0
VEP 706	ECOLOGY OF DISEASES	2+0
VEP 707	MOLECULAR APPROACHES IN EPIDEMIOLOGY	2+1
VEP 708	ADVANCES IN PREVENTION & CONTROL OF INFECTIOUS DISEASES OF RUMINANTS	2+1
VEP 709	ADVANCES IN PREVENTION AND CONTROL OF INFECTIOUS DISEASES OF EQUINES	2+1
VEP 710	ADVANCES IN PREVENTION AND CONTROL OF DISEASES IN PET ANIMALS	2+1
VEP 711	ADVANCES IN PREVENTION AND CONTROL OF DISEASES IN POULTRY	2+1
VEP 712	ADVANCES IN INFECTIOUS DISEASES OF LABORATORY AND ZOO ANIMALS	1+0
VEP 713	ADVANCES IN DIAGNOSIS AND MANAGEMENT OF TOXICOLOGICAL CONDITIONS	1+1
VEP 790	SPECIAL PROBLEM	0+2
VEP 791	DOCTORAL SEMINAR I	1+0
VEP 792	DOCTORAL SEMINAR II	1+0
VEP 799	DOCTORAL RESEARCH	45

Department of Veterinary Medicine

1. Justification for initiation of MVSc Programme in the Department:

Presently, efforts are being directed by the government to impart necessary skills and confidence among veterinary graduates to start and operate their own business units through their own veterinary clinics or the first-hand experience of running Model dairy Farms and Pilot-Plants during the course of study. The start of PG programme in the department will develop the specialist human resource in the field of veterinary medicine and through this specialization the research and developmental programme will be strong enough.

2. Research Gaps:

The animal husbandry department is constantly facing with emerging and reemerging diseases in the field condition due to lack of specialized manpower. They are unable to prevent the diseases that result in high morbidity and mortality in livestock and poultry. Veterinary medicine can boost animal health, by taking both preventive and corrective measures. By maintaining livestock in healthy condition, the production system can be enhanced to cope up from food insecurity, enhance income generation, job creation, economic growth, and poverty alleviation.

3. Number of Seat Proposed: 04 (Four)

4. Course Programme:

A. Major – Veterinary Medicine (Minimum -29 Credit Hours)*

S. No.	Course Title	Code	Cr Hrs	Remark
Core Courses				
1	Ruminant medicine - I	VMD 601	3 (3+0)	Added new
2	Ruminant medicine - II	VMD 602	3 (3+0)	Added new
3	Equine medicine	VMD 603	2 (2+0)	Added new
4	Canine and feline medicine	VMD 604	2 (2+0)	Added new
5	Avian medicine	VMD 605	2 (2+1)	Added new
6	Diseases of animal species of regional importance	VMD 606	2 (1+1)	Added new
7	Metabolic diseases	VMD 607	2 (2+0)	Added new
8	Diseases of animals caused by toxicants	VMD 608	1 (1+0)	Added new
9	Veterinary forensic medicine	VMD 609	2 (1+1)	Added new
10	Clinical diagnostic techniques	VMD 610	2 (0+2)	Added new
11	Clinical practice - I	VMD 611	3 (0+3)	Added new
12	Clinical practice - II	VMD 612	3 (0+3)	Added new
13	Master's seminar	VMD 691	1 (1+0)	Added new
Optional Courses				
14	Veterinary emergency medicine	VMD 613	2 (0+2)	Added new

*As per Veterinary Council of India, the department of Clinical Medicine, Ethics & Jurisprudence, Veterinary Epidemiology & Preventive Medicine have been merged to create Department of Veterinary Medicine. Therefore, there is need to design the syllabus according to the newly formed department. The above mentioned courses were designed after in house discussion in the department keeping the need of students.

B. Minor (Minimum 6-8 Credit Hours)**a. Prescribed Minor Subjects**

S. No.	Name of Minor Subject	Consent of Concerned HOD/OIC
1.	Veterinary Surgery & Radiology	
2.	Veterinary Pharmacology & Toxicology	
3.	Animal Reproduction Gynaecology and Obstetrics	
4.	Veterinary Public Health & Epidemiology	
5.	Veterinary Pathology	

b. List of Courses for Minor in Department of Veterinary Medicine.

S. No.	Course Title	Code	Credit Hrs	Remark
Core Courses				
1	Ruminant medicine - I	VMD 601	3 (3+0)	Added new
Optional Courses				
2	Ruminant medicine - II	VMD 602	3 (3+0)	Added new
3	Equine medicine	VMD 603	2 (2+0)	Added new
4	Canine and feline medicine	VMD 604	2 (2+0)	Added new
5	Avian medicine	VMD 605	2 (2+1)	Added new
6	Diseases of animal species of regional importance	VMD 606	2 (1+1)	Added new
7	Metabolic diseases	VMD 607	2 (2+0)	Added new
8	Diseases of animals caused by toxicants	VMD 608	1 (1+0)	Added new
9	Veterinary forensic medicine	VMD 609	2 (1+1)	Added new
10	Clinical diagnostic techniques	VMD 610	2 (0+2)	Added new

C. Basic Supporting Courses (Minimum 3-5 Credit Hours)

S. No.	Course Title	Code	Credit Hrs	Remark
Core Courses				
1	Experimental Design	STAT-512	3 (2+1)	
Optional Courses				
2	Mathematical Methods for applied Sciences	STAT 501	2 (2+0)	
3	Statistical methods for applied sciences	STAT 511	4 (3+1)	
4	Sampling Techniques	STAT 513	3 (2+1)	
5	Applied Regression Analysis	STAT 521	3 (2+1)	
6	Data Analysis using statistical packages	STAT 531	3 (2+1)	
7	Student can opt any other course as per the need of research with the recommendation of advisory committee.			

D. Deficiency Courses (As per the need of student on the recommendation of advisory committee)

S. No.	Course Title	Code	Credit Hrs	Remark
Student can opt any course from the courses offering in university				

E. Non Credit Compulsory Courses (Any four courses, minimum of 4 Credit Hrs)

S. No.	Course Title	Code	Credit Hrs	Remark
1.	Library and Information Services	PGS 501	1(0+1)	As ICAR syllabus page no. 62
2.	Technical writing and communications skills	PGS 502	1(0+1)	As ICAR syllabus page no. 62
3.	Intellectual Property and its management	PGS 503	1(1+0)	As ICAR syllabus page no. 63
4.	Basic Concepts in Laboratory Techniques	PGS 504	1(0+1)	
5.	Agriculture research, Research Ethics and Rural development Programmes	PGS 505	1(1+0)	
6.	Disaster management	PGS 506	1(1+0)	As ICAR syllabus page no. 64

F. Master's Thesis Research

S. No.	Course Title	Code	Credit Hrs	Remark
1.	Master's Research	VMD 699	20 (0+20)	As ICAR syllabus page no. 8

Total Credit Hours = 29+11+20 = 60

5. Requirements:

A. Faculty strength:

S. No.	Name of Faculty	Designation	Qualification	Experience
1.	Dr. Tarun Kumar Sarkar	Professor	PhD	17 years
2.	Dr. Amit Kumar Verma	Associate Professor	PhD	10 Years
3.	Dr. Vipul Thakur	Assistant Professor	PhD	4.5 Years
4.	Dr. M.V. Jithin	Assistant Professor	PhD	-
5.	Dr. Desh Deepak	Assistant Professor	MVSc	-

B. Credit Load (UG & PG with minor)

- Existing credit load of B.V.Sc & A.H. per faculty: 3.6 Cr. Hr.
- M.V.Sc credit load: 29 Cr. Hr.
- M.V.Sc Minor credit load: 08 Cr. Hr.
- Research credit load : 20 Cr. Hr.
- Total credit load : 57 Cr. Hr.
- Total credit load per faculty: 15 Cr. Hr.

C. Infrastructural & Laboratory Facilities:

There are three laboratories in the department as mentioned below:-

S. No.	Name of the Laboratory
1.	Preventive Medicine Laboratory
2.	Clinical Medicine Laboratory
3.	Diagnostic Laboratory (Veterinary Clinical Complex)

The basic laboratory facilities and equipments for MVSc research works are available at the Department, while the advanced equipments (Laminar air flow, thermalcycler, ELISA reader, Semiautomatic chemistry analyzer etc.) will be used at central instrumentation facilities/Veterinary Clinical complex/Veterinary Public Health & Epidemiology etc.

S. No.	Name of the Equipment
1.	Binocular microscopes
2.	Autoclave
3.	Hot air oven
4.	Incubator
5.	pH meter
6.	Weighing balance
7.	Centrifuge
8.	Magnetic stirrer
9.	Hot plate
10.	Dessicator
11.	Distillation plant
12.	Waterbath
13.	Staining jars
14.	Micropipette set
15.	Glassware and Plasticware in sufficient amount

(Tarun Kumar Sarkar)

Head,

Department of Veterinary Medicine,
College of Veterinary & Animal Sciences

VETERINARY MEDICINE

Course Contents

VMD 601 RUMINANT MEDICINE - I 3(3+0)

Objective

Study of diseases of various body systems, bacterial and viral diseases of bovine, sheep and goats.

Theory

UNIT-I: General systemic states. Diseases of alimentary system, liver and urinary system.

UNIT-II: Diseases of respiratory, nervous, cardiovascular, blood and blood forming organs, musculoskeletal system and skin.

UNIT-III: Mastitis, joint ill, ulcerative lymphangitis, anthrax, clostridial infections, black quarter, bacillary haemoglobinuria, botulism, colibacillosis, pasteurellosis, listeriosis, tuberculosis, Johne's disease, braxy, entero-toxaemia, brucellosis, salmonellosis, leptospirosis, actinomycosis, actinobacillosis.

UNIT-IV: Foot and mouth disease, mucosal disease complex, PPR, malignant head catarrh, infectious bovine rhinotracheitis, rabies, scrapie, louping ill, blue tongue, pox diseases, rinderpest and ephemeral fever.

Suggested Readings

Constable, P.D., Hinchcliff, K.W., Done, S.H. and Grunberg, W (2017). *Veterinary Medicine: A textbook of diseases of cattle, horses, sheep, pigs and goats*. 11th Ed. Elsevier
Chakrabarti A. 1998. *Text Book of Clinical Veterinary Medicine*. Kalyani.

VMD 602 RUMINANT MEDICINE - II 3+0

Objective

Study of parasitic and fungal diseases of bovine, sheep and goats.

Theory

UNIT-I: Ringworm, cutaneous sporotrichosis, aspergillosis, coccidiomycosis, rhinosporidiosis, mucormycosis, histoplasmosis, candidiasis, blastomycosis.

UNIT-II: Bovine tropical theileriosis, babesiosis, anaplasmosis, trypanosomiasis, toxoplasmosis, coccidiosis.

UNIT-III: Sarcocystosis, fascioliosis, amphistomiasis, gastrointestinal nematodiosis, schistosomiasis, verminous bronchitis, echino-coccosis, coenurosis, tape worm infestations.

Suggested Readings

Constable, P.D., Hinchcliff, K.W., Done, S.H. and Grunberg, W (2017). *Veterinary Medicine: A textbook of diseases of cattle, horses, sheep, pigs and goats*. 11th Ed. Elsevier

VMD 603 EQUINE MEDICINE**2+0****Objective**

Study of etiology, epidemiology, pathogenesis, symptomatology, diagnosis, treatment and prevention of diseases of equines.

Theory

UNIT-I: General systemic states and diseases of various body systems (alimentary, urinary, respiratory, nervous, cardiovascular, blood and blood forming organs, musculoskeletal and integumentary).

UNIT-II: Anthrax, tetanus, botulism, strangles, glanders, malignant edema, actinomycosis, clostridial infections, African horse sickness, infectious equine anaemia, equine influenza, equine encephalomyelitis, equine viral rhinopneumonitis, equine viral arteritis, ulcerative lymphangitis. *Rhodococcus equi* pneumonia.

UNIT-III: Trypanosomiasis/ dourine, babesiosis, parasitic pneumonia, cutaneous eczema, cutaneous acne, cutaneous pustular dermatitis, candidiasis, histoplasmosis, coccidiomycosis, dermatophytosis.

Suggested Readings

Robison NE. 1997. *Current Therapy in Equine Medicine*. WB Saunders.

Wintzer HJ. 1986. *Equine Diseases, a Text Book for Students and Practitioners*. Verlag Paul Parey.

Constable, P.D., Hinchcliff, K.W., Done, S.H. and Grunberg, W (2017). *Veterinary Medicine: A textbook of diseases of cattle, horses, sheep, pigs and goats*. 11th Ed. Elsevier.

VMD 604 CANINE AND FELINE MEDICINE**2+0****Objective**

Study of etiology, epidemiology, pathogenesis, symptomatology, diagnosis and treatment of diseases of dogs and cats.

Theory

UNIT-I: General systemic states, hypothyroidism, diabetes mellitus, diabetes insipidus, rickets.

UNIT-II: Bacterial diseases: leptospirosis, tetanus, botulism. Viral diseases: canine distemper, infectious canine hepatitis, parvovirus infection, rabies, coronavirus infection.

UNIT-III: Parasitic diseases: toxoplasmosis, neosporosis, sarcoptic mange, demodectic mange, hookworm and toxocara canis infections, leishmaniasis, canine babesiosis, ehrlichiosis, hepatozoonosis.

UNIT-IV: Feline diseases: feline pan-leucopaenia, feline infectious peritonitis, feline herpesvirus, feline spongiform encephalopathy, feline calicivirus and feline immunodeficiency viral diseases.

Suggested Readings

- Dunn JK. 1999. *Textbook of Small Animal Medicine*. WB Saunders.
Ettinger SJ & Feldman EC. 2000. *Text Book of Veterinary Internal Medicine*. Vols. I, II. Saunders.
Gorman NT. 1998. *Canine Medicine and Therapeutics*. Blackwell.
Tilley LP & Smith FWK Jr. 2004. *The 5-minute Veterinary Consult (Canine and Feline)*. 3rd Ed. Lippincot, Williams & Wilkins.

VMD 605 AVIAN MEDICINE

2+1

Objective

Study of etiology, epidemiology, pathogenesis, symptomatology, diagnosis and treatment of diseases of avian species.

Theory

UNIT-I: Diseases due to deficiency of vitamins (vitamins A, B complex, C, D,E and K); minerals (calcium, phosphorus, manganese, zinc) and sodium chloride; miscellaneous diseases/conditions/ vices.

UNIT-II: Bacterial diseases: *Escherichia coli* and salmonella infections, coryza, fowl cholera, gangrenous dermatitis, mycoplasmosis, CRD

UNIT-III: Viral diseases: Newcastle disease, infectious bursal disease, Marek's disease, infectious bronchitis, inclusion body hepatitis, hydro-pericardium syndrome, avian pox, infectious laryngo-tracheitis, avian influenza, lymphoid leucosis, avian encephalomyelitis, infectious bronchitis.

UNIT-IV: Fungal and parasitic diseases: aspergillosis, candidiosis, favus, mycotoxicosis, coccidiosis, roundworm and tape worm infestations, vaccination schedule etc.

Practical

Post-mortem examination of poultry birds, collection of clinical material for laboratory diagnosis.

Suggested Readings

- Calnek BW, Barnes HA, Beard CW, Reid WM & Yoder HW Jr. 1999. *Diseases of Poultry*. 10th Ed. Iowa State Univ. Press.
Jordan ETW and Pattison, M. 1996. *Poultry Diseases*. WB Saunders.
Leeson S, Diaz G & Summers JD. 2001. *Poultry Metabolic Disorders and Mycotoxins*. IBDC Publ.

**VMD 606 DISEASES OF ANIMAL SPECIES OF REGIONAL (1+1)
IMPORTANCE (SWINE)**

Objective

Study of diseases of important regional animal species (camel).

Theory

UNIT-I: General infectious diseases: anthrax, actinomycosis, black quarter, bronchitis, coccidiosis, contagious echthyma, haemorrhagic septicaemia, hydatidosis, mange, mastitis, camel pox, rabies, surra, tuberculosis etc.

UNIT II: Swine diseases: Swine influenza, hog cholera, African swine fever, swine pox, vesicular exanthema, vesicular stomatitis, rabies.

UNIT III: Porcine enteroviruses, pseudorabies, listeriosis, leptospirosis, brucellosis, anthrax, salmonellosis, swine erysipelas, pasteurellosis, tuberculosis mange etc.

Practical

Recent diagnostic tests and preventive measures for the control of infectious diseases of swine. Investigations of outbreaks. Visits to organized farms.

Suggested Readings

Dunne HW & Leman AD. (Eds.). 1978. *Diseases of Swine*. Iowa State Univ. Press.

Constable, P.D., Hinchcliff, K.W., Done, S.H. and Grunberg, W (2017). *Veterinary Medicine: A textbook of diseases of cattle, horses, sheep, pigs and goats*. 11th Ed. Elsevier

VMD 607 METABOLIC DISEASES

2+0

Objective

Study of metabolic, production and deficiency diseases of domestic animals.

Theory

UNIT-I: General aspects, production diseases (parturient paresis, downer cow syndrome, ketosis, post-parturient haemoglobinuria, hypomagnesemic tetany, pregnancy toxaemia).

UNIT-II: Lactation tetany of mares, eclampsia of bitches, osteodystrophia fibrosa, azoturia of equines, rheumatism-like syndrome in buffaloes, hypothyroidism, diabetes mellitus and diabetes insipidus in dogs.

UNIT-III: Deficiency diseases (calcium, phosphorus, vitamin-D3, vit-A, vit B-complex, vit-C and vit-K).

UNIT-IV: Deficiency diseases (iron, copper, cobalt, zinc, manganese, iodine, vitamin E and selenium).

Suggested Readings

Dunn JK. 1999. *Text Book of Small Animal Medicine*. WB Saunders.
Constable, P.D., Hinchcliff, K.W., Done, S.H. and Grunberg, W
(2017). *Veterinary Medicine: A textbook of diseases of cattle, horses, sheep, pigs and goats*. 11th Ed. Elsevier

VMD 608 DISEASES OF ANIMALS CAUSED BY 1+0 **TOXICANTS**

Objective

Study of diseases caused by various toxicants in domestic animals.

Theory

UNIT-I: Diseases caused by physical agents and poisoning of organic and inorganic compounds. farm chemicals and phytotoxins.

UNIT-II: Diseases caused by mycotoxins and zootoxins, poisonous plants, snake and insect bites.

Suggested Readings

Kahn Cynthia M. (Ed.). 2005. *The Merck Veterinary Manual*. Merck & Co.

Constable, P.D., Hinchcliff, K.W., Done, S.H. and Grunberg, W
(2017). *Veterinary Medicine: A textbook of diseases of cattle, horses, sheep, pigs and goats*. 11th Ed. Elsevier

VMD 609 VETERINARY FORENSIC MEDICINE 1+1

Objective

To familiarize students with various aspects of Veterinary Forensic Medicine.

Theory

UNIT-I: Veterolegal aspects of ante mortem and post mortem examination.

UNIT-II: Examination of wounds, blood, offenses, frauds in animals and their products, animal cruelty and welfare.

UNIT-III: Study of common laws related to veterolegal aspects.

Practical

Ante- mortem and post- mortem examination, examination of wounds, blood, offenses, frauds in animals and their products, collection, dispatch and examination of veterolegal samples.

Suggested Readings

Sharma SN, Gahlot AK, Tanwer RK. 2003. *Veterinary Jurisprudence*. NBS Publishers, Bikaner

VMD 610 CLINICAL DIAGNOSTIC TECHNIQUES 0+2

Objective

Study the diagnostic protocols and procedures for various diseases of farm and companion animals.

Practical

UNIT-I: Clinical tests and their interpretation related to diseases of alimentary tract, liver, cardio vascular system, blood and blood-forming organs of various species of animals.

UNIT-II: Clinical tests and their interpretation related to respiratory, urinary, nervous, endocrine, musculoskeletal and integumentary systems of various species of animals.

Suggested Readings

Kelly WR. 1984. *Veterinary Clinical Diagnosis*. Balliere Tindall, London.
Kaneko JJ, Harvey JW & Bruss ML. 2008. *Clinical Biochemistry of Domestic Animals*. 6th Ed. Academic Press, Amsterdam.

VMD 611 CLINICAL PRACTICE - I 0+3

Objective

Application of the theoretical concepts in practice.

Practical

Diagnostic and therapeutic protocol application, specimen collection, examination and management of diseased farm and companion animals.

Note: This course will be conducted in VCC (Veterinary Clinical Complex), where students shall participate in diagnosis and treatment of diseased animals.

VMD 612 CLINICAL PRACTICE – II 0+3

Objective

Application of the theoretical concepts in practice.

Practical

Diagnostic and therapeutic protocol application, specimen collection, examination and management of diseased farm and companion animals.

Note: This course will be conducted in VCC (Veterinary Clinical Complex), where students shall participate in diagnosis and treatment of diseased animals.

VMD 613 VETERINARY EMERGENCY MEDICINE 0+2

Objective

Diagnosis and therapeutic management of various medical emergencies in farm and companion animals.

Practical

UNIT I

Diagnosis and therapeutic management of various emergencies of cardiovascular, respiratory, gastrointestinal, urinary and nervous systems,

UNIT II

Diagnosis and therapeutic management of various emergencies of toxicities, sting bites and burns of farm and companion animals.

UNIT III

Monitoring critical ill patient, application of emergency care procedures for resuscitation of critically ill patient

Department of Veterinary Medicine

1. Justification for initiation of Doctorate Programme in the Department:

Presently, efforts are being directed by the government to impart necessary skills and confidence among veterinary graduates to start and operate their own business units through their own veterinary clinics or the first-hand experience of running Model dairy farms and Pilot-Plants during the course of study. To provide the high quality learning and research and for the advancement of knowledge of the students, there is requirement of doctorate programme in the department. The start of Doctorate programme in the department will develop the specialist human resource in the field of Veterinary Medicine and through this specialization the research and developmental programme will be strong enough.

2. Research Gaps:

The animal husbandry department is constantly facing with emerging and reemerging diseases in the field condition due to lack of specialized manpower. They are unable to prevent the diseases that result in high morbidity and mortality in livestock and poultry. Veterinary Medicine can boost animal health, by taking both preventive and corrective measures. By maintaining livestock in healthy condition, the production system can be enhanced to cope up from food insecurity, enhance income generation, job creation, economic growth, and poverty alleviation.

3. Number of Seat Proposed: 04 (Four)

4. Course Programme:

A. Major – Veterinary Medicine

S. No.	Course Title	Code	Cr Hrs	Remark
Core Courses				
1	Advances in Gastroentrology	VMD 701	2 (2+0)	Added new
2	Advances in Cardiopulmonary Medicine	VMD 702	2 (2+0)	Added new
3	Advances in Neurological and Urological Disorders	VMD 703	2 (2+0)	Added new
4	Advances in Endocrine and Dermatological Disorders	VMD 704	2 (2+0)	Added new
5	Advances in Metabolic diseases	VMD 705	3 (1+2)	Added new
6	Advances in Infectious Diseases of Ruminants	VMD 706	3 (1+2)	Added new
7	Advances in Infectious Diseases of Equines	VMD 707	3 (1+2)	Added new
8	Advances in Infectious Diseases of Pet	VMD 708	3 (1+2)	Added new

	Animals			
9	Advances in Diseases of Poultry	VMD 709	3 (1+2)	Added new
10	Advances in Veterinary Diagnostics	VMD 710	3 (1+2)	Added new
11	Advanced Clinical Practice I	VMD 712	2 (0+2)	Added new
12	Advanced Clinical Practice II	VMD 713	2 (0+2)	Added new
13	Advanced Clinical Practice III	VMD 714	2 (0+2)	Added new
14	Special Problem	VMD 790	2 (0+2)	Added new
15	Doctoral Seminar I	VMD 791	1 (0+1)	Added new
16	Doctoral Seminar II	VMD 792	1 (0+1)	Added new
Optional Courses				
17	Advances in Veterinary Therapeutics	VMD 711	3 (1+2)	Added new

*As per Veterinary Council of India, the department of Clinical Medicine, Ethics & Jurisprudence and Veterinary Epidemiology & Preventive Medicine have been merged to create Department of Veterinary Medicine. The course curriculum proposed by ICAR for Ph. D programme is available separately for Ph. D in Clinical Medicine, Ethics & Jurisprudence and Veterinary Epidemiology & Preventive Medicine, respectively. Therefore, there is need to design the syllabus according to the newly formed department. The above mentioned courses were designed after in house discussion in the department keeping the need of students.

B. Minor

a. Prescribed Minor Subjects

S. No.	Name of Minor Subject	Consent of Concerned HOD/OIC
1.	Veterinary Surgery & Radiology	
2.	Veterinary Pharmacology & Toxicology	
3.	Animal Reproduction Gynaecology and Obstetrics	
4.	Veterinary Public Health & Epidemiology	
5.	Veterinary Pathology	
6.	Veterinary Microbiology	

b. List of Courses for Minor in Department of Veterinary Medicine.

S. No.	Course Title	Code	Credit Hrs	Remark
Core Courses				
1	Advances in Infectious diseases of Ruminants	VMD 706	3 (1+2)	Added new
Optional Courses				
2	Other courses as per details given in core courses of the department			

C. Basic Supporting Courses

S. No.	Course Title	Code	Credit Hrs	Remark
1	Experimental Design	STAT-512	3 (2+1)	
2	Mathematical Methods for applied Sciences	STAT 501	2 (2+0)	
3	Statistical methods for applied sciences	STAT 511	4 (3+1)	
4	Sampling Techniques	STAT 513	3 (2+1)	
5	Applied Regression Analysis	STAT 521	3 (2+1)	
6	Data Analysis using statistical packages	STAT 531	3 (2+1)	
7	Student can opt any other course as per the need of research with the recommendation of advisory committee.			

*Those students, who have studied above courses in their master's programme need not to study again.

D. Deficiency Courses (As per the need of student on the recommendation of advisory committee)

S. No.	Course Title	Code	Credit Hrs	Remark
Student can opt any course from the courses offering in university				

E. Non Credit Courses

S. No.	Course Title	Code	Credit Hrs	Remark
1.	Library and Information Services	PGS 501	1(0+1)	As ICAR syllabus page no. 62
2.	Technical writing and communications skills	PGS 502	1(0+1)	As ICAR syllabus page no. 62
3.	Intellectual Property and its management	PGS 503	1(1+0)	As ICAR syllabus page no. 63
4.	Basic Concepts in Laboratory Techniques	PGS 504	1(0+1)	
5.	Agriculture research, Research Ethics and Rural Development Programmes	PGS 505	1(1+0)	
6.	Disaster management	PGS 506	1(1+0)	As ICAR syllabus page no. 64

*Those students, who have studied above courses in their master's programme need not to study again.

F. Doctorate's Thesis Research

S. No.	Course Title	Code	Credit Hrs	Remark
1.	Doctorate's Research	VMD 799	45 (0+45)	As ICAR syllabus page no. 8

Total Credit Hours = 30+45 = 75

5. Requirements:

A. Faculty strength:

S. No.	Name of Faculty	Designation	Qualification	Experience
1.	Dr. Tarun Kumar Sarkar	Professor	PhD	17 years
2.	Dr. Amit Kumar Verma	Associate Professor	PhD	10 Years
3.	Dr. Vipul Thakur	Assistant Professor	PhD	05 Years
4.	Dr. Arbind Singh	Assistant Professor	PhD	1.5 Years
5.	Dr. M.V. Jithin	Assistant Professor	PhD	01 year
6.	Dr. Desh Deepak	Assistant Professor	MVSc	-
7.	Dr. Vinod K. Varun	Assistant Professor	MVSc	01 Year

B. Credit Load (UG & PG with minor)

- Existing credit load of B.V.Sc & A.H. per faculty: 3 Cr. Hr.
- M.V.Sc credit load: 19 Cr. Hr.
- M.V.Sc Minor credit load: 08 Cr. Hr.
- Research credit load: 20 Cr. Hr.
- Total credit load: 59 Cr. Hr.
- Total credit load per faculty: 20 Cr. Hr.

C. Infrastructural & Laboratory Facilities:

There are three laboratories in the department as mentioned below:-

S. No.	Name of the Laboratory
1.	Preventive Medicine Laboratory
2.	Clinical Medicine Laboratory
3.	Diagnostic Laboratory (Veterinary Clinical Complex)

The basic laboratory facilities and equipments for doctorate research works are available at the Department, while the advanced equipments (Laminar air flow, thermocycler, ELISA reader, Semiautomatic chemistry analyzer etc.) will be used at central instrumentation facilities/Veterinary Clinical complex/Veterinary Public Health & Epidemiology etc.

S. No.	Name of the Equipment
1.	Thermocycler
2.	Binocular microscopes
3.	Autoclave
4.	Hot air oven
5.	Incubator
6.	Digital pH meter
7.	Weighing balance
8.	Centrifuge
9.	Microhematocrit centrifuge
10.	Magnetic stirrer
11.	Hot plate
12.	Dessicator
13.	Distillation plant
14.	Waterbath
15.	Staining jars

VETERINARY MEDICINE

Course Contents

VMD 701 ADVANCES IN GASTROENTEROLOGY

2+0

Objective

Study of contemporary advances in gastroenterology.

Theory

UNIT-I: Advances in diagnosis, therapy and control of diseases of gastrointestinal system and associated organs of farm animals.

UNIT-II: Advances in diagnosis, therapy and control of diseases of gastrointestinal system and associated organs of companion animals.

Suggested Readings

Selected articles from journals.

VMD 702 ADVANCES IN CARDIO-PULMONARY MEDICINE

2+0

Objective

Study of recent advances in the field of cardiopulmonary medicine.

Theory

UNIT-I: Advances in diagnosis and therapeutic management of diseases of circulatory system.

UNIT-II: Advances in diagnosis and therapeutic management of diseases of respiratory system.

UNIT-III: Advances in diagnosis and therapeutic management of diseases of blood and blood forming organs in animals.

Suggested Readings

Selected articles from journals.

**VMD 703 ADVANCES IN NEUROLOGICAL AND UROLOGICAL
DISORDERS**

2+0

Objective

Study of recent advances in the field of neurological and urological disorders.

Theory

UNIT-I: Advances in diagnosis, therapy and prevention of diseases of nervous and locomotor systems

UNIT-II: Advances in diagnosis, therapy and prevention of diseases of urinary system

Suggested Readings

Selected articles from journals.

VMD 704 ADVANCES IN ENDOCRINE AND DERMATOLOGICAL DISORDERS

2+0

Objective

Study of recent advances in endocrine and dermatological disorders.

Theory

UNIT-I: Advances in diagnosis, therapy and prevention of diseases of integumentary system

UNIT-II: Advances in diagnosis, therapy and prevention of diseases of endocrine system

Suggested Readings

Selected articles from journals

VMD 705 ADVANCES IN METABOLIC DISEASES

1+2

Objective

Study of recent advances and research methodology related to metabolic diseases of domestic/companion animals.

Theory

UNIT-I: Metabolic/production diseases of farm and companion animals.

UNIT-II: Nutritional deficiency diseases of farm and companion animals.

Practical

Short term assignment with some research component pertaining to metabolic/production/nutritional deficiency diseases of domestic and companion animals.

Suggested Readings

Selected articles from journals.

VMD 706 ADVANCES IN INFECTIOUS DISEASES OF RUMINANTS

1+2

Objective

Study of recent advances and research methodology related to infectious diseases of ruminants.

Theory

UNIT-I: Bacterial and viral diseases of bovines, sheep and goats

UNIT-II: Fungal, parasitic and rickettsial diseases of bovines, sheep and goats

Practical

Short term assignment with some research component pertaining to ruminant infectious diseases

Suggested Readings

Selected articles from journals.

VMD 707 ADVANCES IN INFECTIOUS DISEASES OF EQUINES 1+2**Objective**

Study of recent advances and research methodology related to infectious diseases of equines and canines.

Theory

UNIT-I: Bacterial, viral and rickettsial diseases of equines.

UNIT-II: Fungal and parasitic diseases of equines.

Practical

Short term assignment with some research component pertaining to infectious diseases of equines.

Suggested Readings

Selected articles from journals.

VMD 708 ADVANCES IN INFECTIOUS DISEASES OF PET ANIMALS 1+2**Objective**

Study of recent advances and research methodology related to infectious diseases of pet animals.

Theory

UNIT-I: Bacterial, viral and rickettsial diseases of pet animals.

UNIT-II: Fungal and parasitic diseases of pet animals.

Practical

Short term assignment with some research component pertaining to infectious diseases of pet animals.

Suggested Readings

Selected articles from journals.

VMD 709 ADVANCES IN DISEASES OF POULTRY 1+2**Objectives**

Study of recent advances and research methodology related to diseases of poultry.

Theory

UNIT-I: Bacterial and viral diseases of poultry.

UNIT-II: Fungal, parasitic and miscellaneous diseases of poultry.

Practical

Selected articles from journals.

1+2

Selected articles from journals

1+2

Selected articles from journals.

0+2

Practical

Diagnostic and therapeutic protocol application, specimen collection, examination and management of diseased farm and companion animals.

Note: This course will be conducted in TVCC (College Clinics), where students shall participate in diagnosis and treatment of diseased animals.

VMD 713 ADVANCED CLINICAL PRACTICE - II

0+2

Objective

Application of the theoretical concepts in practice.

Practical

Diagnostic and therapeutic protocol application, specimen collection, examination and management of diseased farm and companion animals.

Note: This course will be conducted in TVCC (College Clinics), where students shall participate in diagnosis and treatment of diseased animals.

VMD 714 ADVANCED CLINICAL PRACTICE - III

0+2

Objective

Application of the theoretical concepts in practice.

Practical

Diagnostic and therapeutic protocol application, specimen collection, examination and management of diseased farm and companion animals.

Note: This courses will be conducted in TVCC (College Clinics), where students shall participate in diagnosis and treatment of diseased animals.

VMD 790 SPECIAL PROBLEM 0+2

Objective

A short-term project work on some aspect of etio-pathogenesis, diagnosis and therapy of diseases of domestic animals.

**DEPARTMENT OF VETERINARY PHARMACOLOGY &
TOXICOLOGY, COVAS, SVPUAT, MEERUT- 250110**

Course Title with Credit Load of PhD degree programme as per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume 3 (BSMA 2021) –

Credit requirements

		Doctoral Programme
(i)	Course work	
	Major course	12
	Minor course	06
	Supporting courses	05
	Common course	-
	Seminar	02
(ii)	Thesis Research	75
	Total	100

(i) Course work - (12 credit hrs)

S. No.	Course Title	Code	Credit Hr	Remark
1.	Molecular Pharmacology*	VPT-601	3 (3+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
2.	Advances in Autacoid Pharmacology	VPT-602	1 (1+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
3.	Pharmacology of Herbal Drugs	VPT-603	3 (2+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)

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4.	Biotransformation of Xenobiotics	VPT-604	2 (2+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
5.	Clinical Pharmacology and Pharmacokinetics*	VPT-605	3 (2+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
6.	Pharmacogenomics	VPT-606	2 (2+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
7.	Immunopharmacology and Immunotoxicology	VPT-607	2 (2+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
8.	Molecular Toxicology	VPT-608	3 (3+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
9.	Clinical Toxicology*	VPT-609	3 (2+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
10.	Ecotoxicology	VPT-610	3 (3+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
11.	Regulatory Toxicology	VPT-611	3 (2+1)	As per ICAR Restructured

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				and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
12.	Special Problem	VPT -690	1 (0+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)

*Core courses

Optional courses (Over & Above if needed)

S.No.	Course Title	Code	Credit Hr	Remark
1.	Chronopharmacology	VPT-612	1(1+0)	Added by Department as per the need of R & D Sector
2.	Pharmacovigilance	VPT-613	2 (2+0)	Added by Department as per the need of R & D Sector

(a) Major/Core/Compulsory courses

S. No.	Course Title	Code	Credit Hr	Remark
1.	Molecular Pharmacology	VPT-601	2 (2+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
2.	Clinical Pharmacology and Pharmacokinetics	VPT-605	3 (2+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
3.	Clinical Toxicology	VPT-609	3 (2+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)

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PhD

MVSc course offered for Minor students – Any 6 credits

S. No.	Course Title	Code	Credit Hr	Remark
1.	Molecular Pharmacology*	VPT-601	2 (2+0)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
2.	Clinical Pharmacology and Pharmacokinetics	VPT-605	3 (2+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
3.	Clinical Toxicology	VPT-609	3 (2+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
4.	Pharmacology of Herbal Drugs	VPT-603	3 (2+1)	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)

*Core course

(b) Minor courses (06 credit hrs):

From the subjects closely related to a student's major subject. List of minor subject recommended by BSMA are: Veterinary Biochemistry, Animal/Veterinary biotechnology, Veterinary Physiology, Veterinary Microbiology, Veterinary Pathology, Veterinary Medicine, Veterinary Public health and Epidemiology or any other discipline as per requirements of research problem of the student.

(c) Supporting courses (05 credit hrs): The subject not related to the major subject. The following courses are being offered by various disciplines (The list is only indicative). Based on the requirement, any of the following courses may be opted under the supporting courses.

Code	Course title	Credit hours
STAT 501	Mathematics for Applied Sciences	2 (2+0)
STAT 502	Statistical Methods for Applied Sciences	3+1
STAT 511	Experimental Designs	2+1
STAT 512	Basic Sampling Techniques	2+1
STAT 521	Applied Regression Analysis	2+1

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STAT 522	Data Analysis Using Statistical Packages	2+1
MCA 501	Computers Fundamentals and Programming	2+1
MCA 502	Computer Organization and Architecture	2+0
MCA 511	Introduction to Communication Technologies Computer Networking and Internet	1+1
MCA 512	Information Technology in Agriculture	1+1
BIOCHEM 501	Basic Biochemistry	3+1
BIOCHEM 505	Techniques in Biochemistry	2+2

(d) Common Courses (05 credit hrs):

The following courses (one credit each) will be offered to those students undergoing PhD degree programme who was not studied these courses at masters level :

1. Library and Information Services
2. Technical Writing and Communications Skills
3. Intellectual Property and its management in Agriculture
4. Basic Concepts in Laboratory Techniques
5. Agricultural Research, Research Ethics and Rural Development Programmes.

(e) Seminar (02 credits) :

S. No.	Course Title	Code	Credit Hr	Remark
1.	Doctoral Seminar-I	VPT-691	1+0	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)
2.	Doctoral Seminar-II	VPT-692	1+0	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)

ii. Doctoral Research (75 Credits) :

S. No.	Course Title	Code	Credit Hr	Remark
1.	Doctoral Research	VPT-699	75	As per ICAR Restructured and Revised Syllabi of Post Graduate Programme, volume-3 (BSMA 2021)

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Detail Course Content:

S.No.-1:

I. Course Title : Molecular Pharmacology

II. Course Code : VPT 601

III. Credit Hours : 3+0

IV. Aim of the course : To understand the identification and characterization of receptors and drug receptors interactions and underlying mechanisms of drug receptor interactions and its effects.

Theory

Unit I

Physicochemical properties of drugs, Forces involved in binding of drugs to receptors, Classification of receptors, Molecular structure of receptors, Properties and regulation of receptors, Receptors for physiological regulatory molecules.

Unit II

Receptor conformation and configuration. Structure activity relationship. Ligand binding study of receptors. Cellular mechanism of signal transduction and second messenger systems; Structures, Types and Functions of membrane ion channels.

Unit III

Theories of drug receptor interactions; Analysis of dose response Relationship and molecular mechanisms of drug actions, Quantitation of drug-receptor interactions and effects, receptors as pharmaceutical targets.

Unit IV

Calcium homeostasis within the cells, pharmacology of mitogen-activated protein (MAP) kinases/ extracellular signal-regulated kinases (ERK) and small G proteins. Methods of identification, isolation and characterization of receptors.

S.No.-2:

I. Course Title : Advances in Autacoid Pharmacology

II. Course Code : VPT 602

III. Credit Hours : 1+0

IV. Aim of the course : To study the pharmacodynamics and clinical implications of autacoids.

Theory

Unit I

Histamine and antihistamines, serotonin and its antagonists.

Unit II

Kinins (Bradykinin, kallikrein, Neurokinin, Substance P, Atrial natriuretic peptides and others).

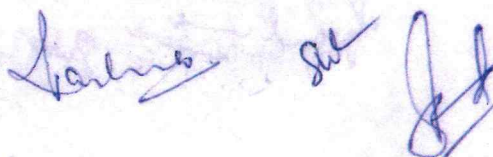
Unit III

Angiotensins, agonists and antagonists.

Unit IV

Eicosanoids, platelet-activating factors, slow reacting substances of anaphylaxis, Putative neurotransmitters (purine nucleotides, peptides, amino acids and nitric oxide).

Unit V



Pharmacotherapy of inflammation, fever, pain and gout; clinical manifestation of autacoid imbalance.

*Added Topic: Chronopharmaceutical drug delivery system for hypertension.

S.No.-3:

I. Course Title : Pharmacology of Herbal Drugs

II. Course Code : VPT 603

III. Credit Hours : 2+1

IV. Aim of the course : To study the Pharmacological, Therapeutic and Toxicological aspects of potential medicinal plants.

Theory

Unit I

Historical aspect, Chemical constituents of medicinal plants and their classification.

*Added Topic: Active metabolites of herbal drugs.

Unit II

Identification, Collection, Preservation, Purification, Isolation, Standardization and Clinical validation of bioactive molecules from vegetable sources.

Unit III

Characterization of pharmacological, therapeutic and toxic effects of potential herbal drugs.

Unit IV

Strategies for development of herbal drugs.

Practical

Extraction, detection, phytochemical analysis and fractionation of medicinal plant extracts. Screening of plant extracts for potential pharmacological activity; Pharmacological effects of herbal drugs on intact and isolated preparations.

S.No.-4:

I. Course Title : Biotransformation of Xenobiotics

II. Course Code : VPT 604

III. Credit Hours : 2+0

IV. Aim of the course : To study the molecular mechanisms of biotransformation of xenobiotics.

Theory

Unit I

Process of drug biotransformation phase I, phase II, and III, Microsomal and nonmicrosomal metabolizing enzyme systems.

Unit II

Mechanisms and processes of synthetic biotransformation

Unit III

Chemical, biological, genetic and environmental factors affecting drug biotransformation mechanisms.

Unit IV

Metabolic interactions, Enzyme induction and inhibition. Scope of biotransformation in drug development.

S.No.-5:

I. Course Title : Clinical Pharmacology and Pharmacokinetics

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II. Course Code : VPT 605

III. Credit Hours : 2+1

IV. Aim of the course : To study the efficacy and disposition of drugs in clinical conditions.

Theory

Unit I

Scope of clinical pharmacology. Drug discovery and clinical trials. Pharmacovigilance, pharmacoepidemiology and pharmacoeconomics.

***Added Topic: Tools using pharmacovigilance**

Unit II

Various drug delivery systems-ruminal, intravaginal, intramammary, etc. Targeted drug delivery systems-liposomes, microparticles, nanoparticles, etc. Factors modifying drug delivery.

***Added Topic: Role of nanotechnology in drug delivery**

Unit III

Application of pharmacokinetic principles in therapeutics. PK-PD relationship and its applications.

Unit IV

Alterations in pharmacological behaviour of drugs in clinical conditions, neonates and pregnancy. Drug interactions and adverse drug reactions. Therapeutic drug monitoring. Rationale of drug use. Medication control programs in performance animals.

Practical

Analysis of pharmacokinetic data and determination of different pharmacokinetic parameters and drugs interactions in normal and diseased animal/ models.

S.No.-6:

I. Course Title : Pharmacogenomics

II. Course Code : VPT 606

III. Credit Hours : 2+0

IV. Aim of the course : To study the concepts of genomics in drug development.

Theory

Unit I

History, concepts and definitions of pharmacogenomics transcriptomics, proteomics and metabolomics. Genomic basis of species variations in drug response.

Unit II

Genetic polymorphism and its impact on pharmacokinetics, drug target receptors and disease-drug response.

Unit III

Pharmacogenomics and drug development, Pharmacogenomics in clinical practice, role of bioinformatics in pharmacogenomics.

Unit IV

Concept of gene therapy, gene therapy of inherited diseases, DNA repair and inactivation strategies. Synthesis of therapeutic proteins.

S.No.-7:

I. Course Title : Immunopharmacology and Immunotoxicology

II. Course Code : VPT 607

III. Credit Hours : 2+0

Signature

IV. Aim of the course : To study the pharmacological intervention of immune functions.

Theory

Unit I

General aspect of immune system and its interaction with nervous and endocrine systems.
Chemical mediators of immune system.

Unit II

Immunomodulators; Immunostimulants, Immunosuppressant and Tolerogens; Immunological basis of drug allergy and drug tolerance.

Unit III

Immunotoxic effects of xenobiotics and environmental pollutants.

Unit IV

Immune deficiencies and autoimmune reactions. Immunotherapeutic applications in asthma, arthritis, cancer, dermatology, and organ transplant, etc.

***Added Topic: Circadian immune regulation.**

S.No.-8:

I. Course Title : Molecular Toxicology

II. Course Code : VPT 608

III. Credit Hours : 3+0

IV. Aim of the course : To understand the mechanisms and targets of cellular/ molecular toxicity.

Theory

Unit I

Cellular, sub-cellular and molecular targets and mechanism of toxicity.

Unit II

Cellular dysfunctions and their consequences, Mechanism of cell death in toxicity, repair and disrepair of toxic damage.

Unit III

Molecular mechanisms of target organ directed toxicity of xenobiotics- brain, hematopoietic system, GIT, liver, lungs, kidneys, reproductive system, skin, etc.

Unit IV

Mechanism of chemical mutagenesis, carcinogenesis, teratogenesis and radiation toxicity.

S.No.-9:

I. Course Title : Clinical Toxicology

II. Course Code : VPT 609

III. Credit Hours : 2+1

IV. Aim of the course : To study the concepts of clinical toxicology and forensic toxicology.

Theory


Unit I

Scope of clinical and forensic toxicology. Toxicological investigation, management and antidotal therapy of poisonings.

Unit II

Clinical aspects of poisoning due metals, non-metals and pesticides.

Unit III

Same as 

Clinical aspects of poisoning due to mycotoxins, animal and bacterial toxins, solvents and vapours, drugs and other food/ feed contaminants.

Unit IV

Forensic toxicology. GLP in toxicological evaluation.

Practical

General screening of biological material for toxicants, analysis of clinical samples for poisons, use of biomarkers in the assessment of toxicity.

S.No.-10:

I. Course Title : Ecotoxicology

II. Course Code : VPT 610

III. Credit Hours : 3+0

IV. Aim of the course : To impart knowledge regarding ecotoxicology for conservation of healthy eco-system.

Theory

Unit I

Basic principles of ecotoxicology. Sources of contamination and effects of pollutants on eco-health.

Unit II

Chemical contamination of air, water, soil and food by major agricultural and industrial chemicals – pesticides, hydrocarbons and metals. Fate of chemicals in the environment and target species.

Unit III

Toxic effects of radiations. Marine and wildlife as monitors of environmental quality, Bioaccumulation and Biomagnifications of toxicants.

Unit IV

Biomarkers of monitoring the impact of environmental pollutants, Environmental hazard and Risk identification from Mixture of chemicals, Contamination control and approaches to rehabilitating damaged ecosystems, Nanoparticle toxicology, ecological emergencies.

S.No.-11:

I. Course Title : Regulatory Toxicology

II. Course Code : VPT 611

III. Credit Hours : 2+1

IV. Aim of the course : To study acts and regulations and risk assessment regarding use of drugs, chemicals and cosmetics.

Theory

Unit I

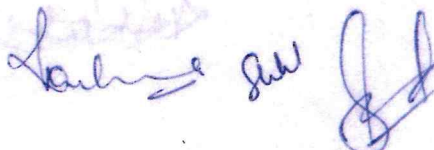
Principles of risk assessment. Test protocols for toxicity studies of various national and international regulatory agencies.

***Added Topic: EPA guidelines.**

Unit II

Regulatory essential dose levels in chemical risk assessment (NOEL, NOAEL, LOEL, LOAEL and AOEL). Recommended acceptable levels of environmental pollutants.

Unit III



Risk assessment in practice. Classification and marking/ branding of chemicals. Monitoring/ surveillance of chemicals. Exposure assessment and modelling.

Unit IV

Quality control in safety research (GLP). Operation of product register.

Practical

Good laboratory practice in toxicological research. Screening procedures in regulatory toxicology. Determination of MRL, ADI, NOEL, NOAEL, LOEL, LOAEL and AOEL. Visit to nearest industrial area.

S.No.-12:

I. Course Title : Special Problem

II. Course Code : VPT 690

III. Credit Hours : 0+1

IV. Aim of the course: To provide expertise in handling practical research problem(s).

Practical

Short research problem(s) involving contemporary issues and research techniques.

Additional courses added/offered by department as an optional courses with syllabus:

S.No.-1:

I. Course Title : Chronopharmacology

II. Course Code : VPT 612

III. Credit Hours : 1+0

IV. Aim of the course : To study the effects of chronobiology on drug action at body systems.

Theory

Unit I

Introduction: Definition of rhythm and cycles, Biological clock and their significance leading to chronotherapy

Unit II

Chronobiology, basis for chronopharmacology

Unit III

Chronopharmacology in therapeutic drug monitoring-dependencies between rhythmic of Pharmacokinetic processes and drug concentration in blood

Unit IV

Chronopharmacology: New insights and therapeutic implications

S.No.-2:

I. Course Title : Pharmacovigilance

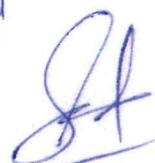
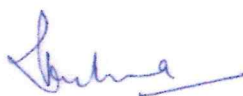
II. Course Code : VPT 613

III. Credit Hours : 2+0

IV. Aim of the course : To study the surveillance of drug for drug safety during therapeutic management.

Theory

Unit I



Introduction: History and progress of pharmacovigilance, Significance of safety monitoring, Pharmacovigilance in India and abroad

Unit II

WHO international drug monitoring programme, Regulatory terminologies of ADR, evaluation of medication safety, roles and responsibilities in Pharmacovigilance

Unit III

International classification of diseases, International Nonproprietary names for drugs, Passive and active surveillance, Comparative observational studies, targeted clinical investigations and vaccine safety surveillance.

Unit IV

Tools used in pharmacovigilance

Handwritten signature: Sushant Shekhar



सरदार वल्लभभाई पटेल कृषि एवं प्रौद्योगिक विश्वविद्यालय, मेरठ।

माननीय प्रबन्ध परिषद की 51वीं बैठक दिनांक 06 दिसम्बर, 2022 का कार्यवृत्त

माननीय प्रबन्ध परिषद की 51वीं बैठक दिनांक 06 दिसम्बर, 2022 को पूर्वान्ह 11:00 बजे से सरदार वल्लभभाई पटेल कृषि एवं प्रौद्योगिक विश्वविद्यालय, मेरठ में सम्पन्न हुई। बैठक में माननीय सदस्यों की उपस्थिति निम्नवत् थी:-

1. डा0 के0के0 सिंह, कुलपति	अध्यक्ष
2. श्री निखिल कुमार त्यागी, लाइव स्टॉक ब्रीडर	सदस्य
3. श्रीमती सुमन त्यागी, सामाजिक महिला कार्यकर्त्री	सदस्य
4. श्री मनोहर सिंह तोमर, प्रगतिशील कृषक	सदस्य
5. श्री अतुल कुमार सिंह, अपर निदेशक, कोषागार एवं पेंशन, मेरठ मण्डल, मेरठ (अपर मुख्य सचिव वित्त, उ0प्र0 के प्रतिनिधि)	सदस्य
6. डा0 अमरनाथ मिश्र, संयुक्त निदेशक कृषि, मेरठ मण्डल, मेरठ (अपर मुख्य सचिव, कृषि शिक्षा एवं अनुसंधान अनुभाग, उ0प्र0, लखनऊ एवं निदेशक कृषि, उत्तर प्रदेश, लखनऊ के प्रतिनिधि)	सदस्य
7. डा0 आर0के0 गुप्ता, क्षेत्रीय उच्च शिक्षा अधिकारी, मेरठ मण्डल, मेरठ (अपर मुख्य सचिव, उच्च शिक्षा, उ0प्र0 के प्रतिनिधि)	सदस्य
8. डा0 ब्रजवीर सिंह, अपर निदेशक, पशुपालन, उ0प्र0, लखनऊ। (निदेशक पशुपालन, उ0प्र0 के प्रतिनिधि)	सदस्य
9. श्रीमती लक्ष्मी मिश्रा, वित्त नियंत्रक	सचिव

सर्वप्रथम मा0 प्रबन्ध परिषद के सदस्यों द्वारा सरदार वल्लभभाई पटेल कृषि एवं प्रौद्योगिक विश्वविद्यालय, मेरठ में कुलपति के पद पर नव नियुक्त डा0 के0के0 सिंह को बुके भेंट करते हुए स्वागत किया गया। तदोपरांत मा0 कुलपति जी द्वारा मा0 सदस्यों को अपना संक्षिप्त परिचय देते हुए मा0 सदस्यों से भी परिचय प्राप्त किया गया। इसके साथ ही मा0 कुलपति जी द्वारा नियुक्ति उपरांत उनके द्वारा विश्वविद्यालय में किये जा रहे

लक्ष्मी मिश्रा
वित्त नियंत्रक

स० व० प० कृषि एवं प्रौद्योगिक
विश्वविद्यालय, मेरठ-250110

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डा० के०के० सिंह
कुलपति
स.व.प. कृषि एवं प्रौ.वि.वि. मेरठ


प्रारंभिक कार्यों के संदर्भ में मा0 सदस्यों को अवगत कराया गया। जिसके अन्तर्गत अवगत कराया गया कि कृषि विश्वविद्यालय, मेरठ में रिसर्च प्रोजेक्ट की स्थिति अच्छी अवस्था न होने के कारण वैज्ञानिकों को रिसर्च प्रोजेक्ट लाने हेतु निर्देशित किया गया है। विश्वविद्यालय के विभिन्न महाविद्यालयों के क्लास रूमों में सी0सी0टी0वी0 लगाने हेतु निर्देशित किया गया है। मा0 कुलपति जी द्वारा अवगत कराया गया कि उनके द्वारा विश्वविद्यालय में कार्यभार ग्रहण करने के उपरांत कुल 5-6 कृषि विज्ञान केन्द्रों का दौरा किया जा चुका है। विश्वविद्यालय में फण्ड की उपलब्धता को बढ़ाने तथा शिक्षण, शोध एवं प्रसार से सम्बन्धित कार्यों पर निरन्तर समीक्षा के उद्देश्य से प्रतिमाह पहले बुधवार के दिन एक बैठक उनकी अध्यक्षता में निर्धारित की गयी है। विश्वविद्यालय में कॉलेज ऑफ शुगरकेन को जुलाई-2022 के सेशन से प्रारम्भ किये जाने के प्रयास किये जा रहे हैं। मा0 कुलपति जी द्वारा मा0 सदस्यों से अनुरोध किया गया कि मा0 सदस्य अपने अनुभव एवं विचार उनके समक्ष प्रस्तुत कर सकते हैं।

मा0 कुलपति जी द्वारा मा0 सदस्यों को यह भी अवगत कराया गया कि क्षेत्र के किसानों से उनके खेत-खलिहानों से सीधे विश्वविद्यालय कैम्पस से ऑनलाईन मोड में जुड़कर उनकी विभिन्न समस्याओं का निस्तारण फील्ड स्तर पर ही किये जाने के प्रयास किये जायेंगे। विश्वविद्यालय में कैम्पस प्लेसमेन्ट की स्थिति अच्छी न बताते हुए मा0 कुलपति जी द्वारा मा0 सदस्यों को आश्वस्त किया गया कि विश्वविद्यालय में कैम्पस प्लेसमेन्ट बढ़ाने के लिए सशक्त प्रयास किये जायेंगे।


उपरोक्त के अतिरिक्त वित्त नियन्त्रक द्वारा विश्वविद्यालय में कॉलेज ऑफ शुगरकेन की स्थापना के प्रयास हेतु श्री निखिल कुमार त्यागी, लाईव स्टॉक ब्रीडर, श्री मनोहर सिंह तोमर, प्रगतिशील कृषक एवं श्रीमती सुमन त्यागी का विशेष आभार व्यक्त किया गया।

प्रस्ताव संख्या 51.1 : माननीय प्रबन्ध परिषद की 50वीं बैठक दिनांक 02 मई, 2022 के कार्यवृत्त की पुष्टि।

मा0 प्रबन्ध परिषद की 50वीं बैठक दिनांक 02 मई, 2022 के कार्यवृत्त की पुष्टि की गयी।


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वित्त नियन्त्रक
स० व० प० कृषि एवं प्रौद्योगिक
विश्वविद्यालय, मेरठ-250110

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डा० के.के. सिंह
कुलपति
स.प. कृषि एवं प्रौ. वि. वि, मेरठ

प्रस्ताव संख्या 51.2 : माननीय प्रबन्ध परिषद की 50वीं बैठक दिनांक 02 मई, 2022 के निर्णयों की अनुपालन आख्या।


मा0 प्रबन्ध परिषद की 50वीं बैठक दिनांक 02 मई, 2022 के निर्णयों की अनुपालन आख्या का अवलोकन किया गया, जिस पर मा0 सदस्यों द्वारा सहमति व्यक्त की गयी एवं निम्नवत अभिमत व्यक्त किये गये:-

1. मा0 प्रबन्ध परिषद के सदस्यों द्वारा मा0 प्रबन्ध परिषद की 50वीं बैठक दिनांक 02.05.2022 के प्रस्ताव संख्या-50.7 पर डा0 आरती भट्टेले, निलम्बित प्राध्यापक के सम्बन्ध में विश्वविद्यालय द्वारा की गयी समुचित कार्यवाही करने के संदर्भ निर्देशित किया गया।

(कार्यवाही: कुलसचिव/निदेशक प्रशासन एवं अनुश्रवण)

2. मा0 प्रबन्ध परिषद के सदस्यों द्वारा मा0 प्रबन्ध परिषद की 50वीं बैठक दिनांक 02.05.2022 के प्रस्ताव संख्या-50.8 पर डा0 योगेश प्रसाद, प्राध्यापक के सम्बन्ध में जानकारी चाही गयी। जिसके सम्बन्ध में वित्त नियन्त्रक एवं कुलसचिव द्वारा अवगत कराया गया कि मा0 उच्च न्यायालय द्वारा दिये गये निर्देशों के क्रम में डा0 योगेश प्रसाद को विश्वविद्यालय में ज्वाइन कराते हुए उनकी जांच हेतु पुनः एक समिति का गठन कर दिया गया है। समिति द्वारा जांच-आख्या प्रस्तुत करने के उपरान्त अग्रिम कार्यवाही की जायेगी।

(कार्यवाही: कुलसचिव/निदेशक प्रशासन एवं अनुश्रवण)


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विश्वविद्यालय, मेरठ-250110


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डा० के.के. सिंह
कुलसचिव
स.व.प. कृषि एवं प्रौ.वि.वि. मेरठ

प्रस्ताव संख्या 51.3 :

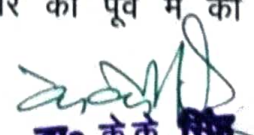
डा० लोकेश कुमार गंगवार, प्राध्यापक (आनुवांशिकी एवं पादप प्रजनन) द्वारा पूर्व में की गयी सेवाओं को जोड़े जाने के संबंध में।

डा० लोकेश कुमार गंगवार, प्राध्यापक (आनुवांशिकी एवं पादप प्रजनन) कृषि महाविद्यालय, सरदार वल्लभभाई पटेल कृषि एवं प्रौद्योगिक विश्वविद्यालय, मेरठ द्वारा कृषि विश्वविद्यालय, मेरठ में दिनांक 24.03.2005 से 10.09.2013 तक विषय वस्तु विशेषज्ञ/सहायक प्राध्यापक (आनुवांशिकी एवं पादप प्रजनन) के पद पर एवं बांदा कृषि एवं प्रौद्योगिक विश्वविद्यालय, बांदा में दिनांक 11.09.2013 से 23.07.2018 तक सह प्राध्यापक, (आनुवांशिकी एवं पादप प्रजनन) के पद पर दी गयी सेवाओं को जोड़ने एवं सेवाओं की गणना पेंशन हेतु करने के संदर्भ में वित्त नियन्त्रक द्वारा विशेष सचिव, उ०प्र० शासन, लखनऊ के दूरभाष पर दिये गये निर्देशों के सम्बन्ध में मा० प्रबन्ध परिषद के सदस्यों को अवगत कराया गया। इस सम्बन्ध में अपर मुख्य सचिव, उत्तर प्रदेश शासन, लखनऊ के प्रतिनिधि डा० अमरनाथ मिश्रा, संयुक्त निदेशक कृषि द्वारा अभिमत व्यक्त किया गया कि सेवा जोड़ने से सम्बन्धित प्रस्ताव सम्बन्धितों द्वारा विलम्ब से प्रस्तुत किये जा रहे हैं। ऐसी स्थिति में विश्वविद्यालय प्रशासन ऐसे प्रकरणों के संदर्भ में एक आदेश-पत्र जारी करें, कि सेवा जोड़ने से सम्बन्धित कार्मिक विश्वविद्यालय में सेवा ग्रहण करने के उपरांत ही अपना आवेदन प्रस्तुत करें।


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उपर्युक्त प्रस्ताव के संदर्भ में मा० प्रबन्ध परिषद के सदस्यों द्वारा सर्वसम्मति से निर्णय लिया गया कि डा० लोकेश कुमार गंगवार की पूर्व में की गयी सेवाओं से

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डा० के.के. सिंह
कुलपति
स.व.प. कृषि एवं प्रौद्योगिकी, मेरठ

सम्बन्धित प्रपत्रों/अभिलेखों की जांच करते हुए प्रस्ताव मा० प्रबन्ध परिषद की आगामी बैठक में प्रस्तुत किया जाये।

(कार्यवाही: निदेशक प्रशासन एवं अनुश्रवण/कुलसचिव)

प्रस्ताव संख्या: 51.4— डा० रश्मि, प्राध्यापक (मौलिक विज्ञान विभाग) द्वारा पूर्व में की गयी सेवाओं को जोड़े जाने के संबंध में।

डा० रश्मि प्राध्यापक (मौलिक विज्ञान) की भारतीय वानिकी अनुसंधान एवं शिक्षा परिषद देहरादून, उत्तराखण्ड में वैज्ञानिक—ई दिनांक 07.04.2003 से 28.05.2019 तक के पद पर की गयी सेवा को पेंशन आगणन हेतु अर्ह सेवा के निमित्त आगणित किये जाने हेतु सेवाएँ अन्य प्रदेश/केन्द्रीय होने के कारण उत्तर प्रदेश शासन को प्रेषित किये जाने के लिए माननीय प्रबन्ध परिषद के सदस्यों द्वारा सर्वसम्मति से अनुमोदन प्रदान किया गया।


(कार्यवाही: निदेशक प्रशासन एवं अनुश्रवण/कुलसचिव)

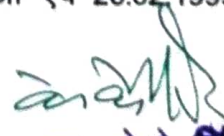
प्रस्ताव संख्या: 51.5—

डा० वीर पाल सिंह, सह प्राध्यापक (पशुधन उत्पाद प्रौद्योगिकी विभाग), पशुचिकित्सा एवं पशुविज्ञान महाविद्यालय द्वारा पूर्व में की गयी सेवाओं को जोड़े जाने के संबंध में।

डा० वीर पाल सिंह, पंडित दीन दयाल उपाध्याय पशुचिकित्सा विज्ञान विश्वविद्यालय एवं गो अनुसंधान संस्थान (दुबासु) मथुरा में दिनांक 01 अप्रैल 2009 से 16 मई, 2018 तक सहायक आचार्य (पशुधन उत्पाद प्रौद्योगिकी विभाग) के पद पर दी गयी सेवाओं एवं 26.02.1999 से 31.03.2009 तक

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कुलपति
स. व. प. कृषि एवं प्रौद्योगिकी विभाग, मेरठ

पशुचिकित्सा अधिकारी, पशुपालन विभाग, उत्तर प्रदेश की पूर्व सेवाओं को जोड़ने एवं सेवाओं की गणना पेंशन हेतु डा० वीर पाल सिंह की मूल पत्रावली माननीय कुलपति जी द्वारा मा० सदस्यों के समक्ष सम्बन्धित विभाग द्वारा मंगायी गयी।

जिसपर माननीय प्रबन्ध परिषद के सदस्यों द्वारा डा० वीर पाल सिंह द्वारा उपरोक्तानुसार पूर्व की सेवाओं को जोड़ने एवं सेवाओं की गणना पेंशन हेतु करने के लिए सर्वसम्मति से अनुमोदन प्रदान किया गया।

(कार्यवाही: निदेशक प्रशासन एवं अनुश्रवण/कुलसचिव)


प्रस्ताव संख्या: 51.6—

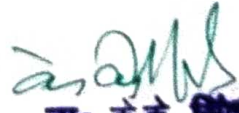
विद्वत परिषद की 85वीं बैठक दिनांक 21.11.2022 के कार्यवृत्त का अनुमोदन।

विश्वविद्यालय की विद्वत परिषद की 85वीं बैठक दिनांक 21 नवम्बर, 2022 में लिए गये निर्णयों का अनुमोदन किया गया। विश्वविद्यालय की विद्वत परिषद की 85वीं बैठक दिनांक 21.11.2022 का कार्यवृत्त के सम्बन्ध में विश्वविद्यालय के कुलसचिव द्वारा विस्तार से अवगत कराया गया। साथ ही मा० सदस्यों द्वारा निम्न अभिमत व्यक्त किये गये:—

1. मा० प्रबन्ध परिषद के सदस्यों द्वारा विद्वत परिषद की 83वीं बैठक में विश्वविद्यालय में आयोजित होने वाले दीक्षांत समारोह में छात्र-छात्राओं को प्रायोजित पदक प्रदान करने के सम्बन्ध में सीड मनी की धनराशि रू० 100000/- को कम आंकते हुए निर्णय लिया गया कि इसकी सीमा न्यूनतम रू० 200000/- होनी चाहिए। इसके अतिरिक्त प्रथम वर्ष में सम्बन्धित से पुरस्कार इत्यादि पर होने वाले अतिरिक्त व्यय हेतु रू० 5000/- के स्थान पर न्यूनतम रू० 10000/- करने का

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स.न.प. कृषि एवं प्रौ. वि. वि. मेरठ

निर्णय लेते हुए इन धनराशियों का पुनरीक्षण प्रत्येक 03 वर्ष के पश्चात अनिवार्य रूप से करने का भी निर्णय लिया गया।


(कार्यवाही: कुलसचिव)

2. मा0 प्रबन्ध परिषद के सदस्यों द्वारा विद्वत परिषद 84वीं बैठक दिनांक 21.11.2022 के संकल्प संख्या-15 पर उल्लेखित पशुचिकित्सा महाविद्यालय के रिक्त शैक्षणिक पदों की शैक्षिक अर्हता, स्कोर कार्ड, घोषणा-पत्र एवं विज्ञापन आदि के सम्बन्ध में प्राध्यापक पदों की अर्हता में से पी0एच0डी0 गार्डिड की छूट दिये जाने के सम्बन्ध में श्री राज्यपाल सचिवालय, राजभवन, लखनऊ से निर्देश प्राप्त करने हेतु कहा गया।

(कार्यवाही: कुलसचिव)

3. विद्वत परिषद 84वीं बैठक दिनांक 21.11.2022 के संकल्प संख्या-17 पर प्रस्तुत प्रस्ताव के अन्तर्गत दिनांक 16.12.2022 को आयोजित होने वाले विश्वविद्यालय के 15वें दीक्षांत समारोह में स्नातक/स्नातकोत्तर/पी0एच0डी0 स्तर पर उत्तीर्ण छात्र/छात्राओं को उपाधि प्रदान करने से सम्बन्धित प्रस्ताव पर डा0 आर0के0 गुप्ता, क्षेत्रीय उच्च शिक्षा अधिकारी द्वारा अभिमत व्यक्त किया गया कि 15वें दीक्षांत समारोह में उपाधिप्राप्तकर्ता छात्र/छात्राओं के टेबुलेशन की जांच सतर्कतापूर्वक की जाये। इस सम्बन्ध में विश्वविद्यालय के कुलसचिव द्वारा आश्वस्त किया गया कि इस कार्य हेतु कुलसचिव कार्यालय में पूरी टीम कार्य कर रही है।

(कार्यवाही: कुलसचिव)


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स.त.प. कृषि एवं प्रौ.वि.वि. मेरठ

प्रस्ताव संख्या: 51.7—

डा० फगन सिंह, सेवानिवृत्त प्राध्यापक, पादप रोग विज्ञान विभाग, कृषि महाविद्यालय को आवास किराया में कोरोना महामारी— 2019 के दृष्टिगत शिथिलता प्रदान करने के सम्बन्ध में।

विश्वविद्यालय के सचिव, आवास आवंटन समिति द्वारा प्रस्तुत प्रस्ताव के संदर्भ में वित्त नियन्त्रक द्वारा अवगत कराया गया कि डा० फगन सिंह, सेवानिवृत्त प्राध्यापक, पादप रोग विज्ञान विभाग, कृषि महाविद्यालय द्वारा सेवानिवृत्ति उपरांत कुल 29 माह विश्वविद्यालय के सरकारी आवास (टाईप-5) में रहे, जिसमें उनके द्वारा किराये के रूप में रू० 1,40,400.00 मात्र की धनराशि विश्वविद्यालय के लेखा अनुभाग में जमा करायी गयी। जिसपर विश्वविद्यालय सचिव, आवास आवंटन समिति द्वारा विश्वविद्यालय के हाऊस एलोटमेन्ट नियम (एच०आर०ए०-15) के अन्तर्गत गणना करते हुए उपर्युक्त अवधि का कुल आवास किराया रू० 13,03,200.00 (रू० तेरह लाख तीन हजार दो सौ मात्र) दर्शाते हुए उनके द्वारा जमा करायी गयी धनराशि के बाद रू० 11,61,800.00 (रू० ग्यारह लाख इकसठ हजार आठ सौ मात्र) बताया गया है।


इस सम्बन्ध में मा० सदस्यों सर्वसम्मति से अभिमत व्यक्त किया गया कि कोविड-19 की महामारी के दृष्टिगत डा० फगन सिंह, सेवानिवृत्त प्राध्यापक को आवास किराये में शिथिलता प्रदान की जाये। इस पर प्रबन्ध समिति के सदस्यों ने निर्णय लिया कि डा० फगन सिंह, सेवानिवृत्त प्राध्यापक को कोविड-19 की महामारी के दृष्टिगत आवास किराये में शिथिलता प्रदान करते हुए नियमानुसार कुल 29 माह में से 06 माह की छूट प्रदान करते हुए किसी भी प्रकार की पैनाल्टी न लेते हुए उनके सेवानिवृत्ति के समय वेतनमान पर अनुमन्य मकान किराये भत्ते को 23 माह से गुणा करके जमा धनराशि



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कृषि विभाग
स.व.प. कृषि एवं प्रौ. वि. वि. मेरठ

को घटाकर शेष धनराशि विश्वविद्यालय के लेखा अनुभाग में जमा कराते हुए रसीद निर्गत की जायेगी।

उपर्युक्त पर मा0 प्रबन्ध परिषद के सदस्यों द्वारा सर्वसम्मति से अनुमोदन प्रदान किया गया।

(कार्यवाही: वित्त नियन्त्रक/सचिव, आवास आवंटन समिति)

प्रस्ताव संख्या: 51.8—


माननीय उच्च न्यायालय, इलाहाबाद में विश्वविद्यालय से सम्बन्धित विभिन्न वादों का पक्ष मा0 न्यायालय के समक्ष रखने हेतु श्री शुभ्रांशु शेखर, अधिवक्ता को नामित करने के सम्बन्ध में प्रस्ताव।

विश्वविद्यालय के अध्यक्ष, विधिक समिति द्वारा प्रस्तुत प्रस्ताव के अन्तर्गत माननीय उच्च न्यायालय, इलाहाबाद में विश्वविद्यालय से सम्बन्धित विभिन्न वादों का पक्ष मा0 न्यायालय के समक्ष रखने हेतु श्री शुभ्रांशु शेखर, अधिवक्ता को नामित करने के सम्बन्ध में मा0 प्रबन्ध परिषद के सदस्यों द्वारा सर्वसम्मति से अनुमोदन प्रदान किया गया है। उपर्युक्त अधिवक्ता को विश्वविद्यालय द्वारा प्रतिवाद देय शुल्क हेतु पूर्व में जारी आदेश संख्या सवप/का0अनु0/2021/8995 दिनांक 20.02.2021 के अनुसार होगा।

(कार्यवाही: कुलसचिव/अध्यक्ष विधिक समिति/निदेशक प्रशासन एवं अनुश्रवण)

उपरोक्त बिन्दुओं के अतिरिक्त मा0 सदस्यों द्वारा निम्नवत अभिमत व्यक्त किये गये:—

1. श्री मनोहर सिंह तोमर, प्रगतिशील कृषक एवं श्री निखिल कुमार त्यागी, लाईव स्टॉक ब्रीडर एवं श्रीमती सुषमा त्यागी


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कुलपति
स.व.प. कृषि एवं प्रौ. वि. मेरठ

द्वारा विश्वविद्यालय के नवनियुक्त मा० कुलपति जी को धन्यवाद दिया गया।

2. श्री मनोहर सिंह तोमर, प्रगतिशील कृषक एवं श्री निखिल कुमार त्यागी, लाईव स्टॉक ब्रीडर द्वारा विश्वविद्यालय के पूर्व कुलपति डा० आर०के० मित्तल द्वारा अपने कार्यकाल के अन्तिम दिवसों में की नियुक्ति पर आपत्ति व्यक्त करते हुए कहा गया कि उनके द्वारा कृषि विज्ञान केन्द्रों पर एस०एम०एस० के पदों पर की गयी भर्ती की नियुक्ति के लिफाफों को मा० प्रबन्ध परिषद के सम्मुख खोले जाने चाहिए थे। इस सम्बन्ध में वित्त नियन्त्रक द्वारा मा० सदस्यों को अवगत कराया गया कि कृषि विज्ञान केन्द्रों के एस०एम०एस० के पद गैर शैक्षणिक स्तर के होने के कारणवश इनके लिफाफे मा० प्रबन्ध परिषद के सम्मुख नहीं खोले गये। इसी प्रकरण पर मा० कुलपति जी द्वारा मा० सदस्यों को आश्वस्त किया गया कि इससे सम्बन्धित प्रस्ताव मा० सदस्यों के सम्मुख मा० प्रबन्ध परिषद की आगामी बैठक में प्रस्तुत किया जायेगा।

(कार्यवाही: कुलसचिव/निदेशक प्रशासन एवं अनुश्रवण)

3. श्री मनोहर सिंह तोमर, प्रगतिशील कृषक द्वारा कृषि विज्ञान केन्द्रों के गैर शैक्षणिक पदों पर शीघ्र भर्ती हेतु कहा गया एवं विश्वविद्यालय मुख्यालय के आयोग में चले गये गैर शैक्षणिक पदों को आयोग से वापस लाते हुए उनपर विश्वविद्यालय स्तर पर भर्ती करने हेतु एवं कृषि विज्ञान केन्द्रों पर रिक्त होने वाले पदों पर भर्ती हेतु भी कहा गया। जिसपर मा० कुलपति जी द्वारा मा० प्रबन्ध


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परिषद के सदस्यों को आश्वस्त किया गया कि भर्ती प्रक्रिया शीघ्र प्रारम्भ किये जाने के प्रयास किये जायेंगे।

(कार्यवाही: कुलसचिव/निदेशक प्रशासन एवं अनुश्रवण)


4. श्री मनोहर सिंह तोमर, प्रगतिशील कृषक द्वारा अवगत कराया गया कि विश्वविद्यालय में कुछ शिक्षकों को CAS के लाभ से अभी प्राप्त नहीं हुआ है। इसपर मा० कुलपति द्वारा शीघ्र कार्यवाही के लिए आश्वस्त किया गया।

(कार्यवाही: कुलसचिव/निदेशक प्रशासन एवं अनुश्रवण)

5. डा० अमरनाथ मिश्रा, संयुक्त निदेशक कृषि, मेरठ मण्डल, मेरठ द्वारा अभिमत व्यक्त किया गया कि विश्वविद्यालय द्वारा रिक्तियों के विज्ञापन हेतु एक कैलेंडर तैयार कर लिया जाये, जिससे प्रतिवर्ष निर्धारित समय पर रिक्तियों को भरने हेतु विज्ञापन विज्ञापित कराया जा सके।

(कार्यवाही: कुलसचिव/निदेशक प्रशासन एवं अनुश्रवण)

6. श्री मनोहर सिंह तोमर, प्रगतिशील कृषक एवं श्री निखिल कुमार त्यागी, लाईव स्टॉक ब्रीडर द्वारा विश्वविद्यालय एवं कृषि विज्ञान केन्द्रों के फार्म पर में गन्ने के बीज की पैदावार हेतु विचार प्रस्तुत किया गया। जिसपर मा० कुलपति जी द्वारा मा० सदस्यों को समुचित कार्यवाही हेतु आवश्यक किया गया।


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7. श्री निखिल कुमार त्यागी, लाईव स्टॉक ब्रीडर द्वारा अभिमत व्यक्त किया गया कि पश्चिमी उत्तर प्रदेश की भौगोलिक परिस्थितियों के दृष्टिगत गन्ने के साथ-साथ पापुलर के पेड़ों की पैदावार किया जाना काफी उपयुक्त होगा। साथ श्री त्यागी द्वारा यह भी अवगत कराया गया कि उनके गृह जनपद सहारनपुर के विभिन्न क्षेत्रों में किसानों द्वारा बड़े स्तर पर पोपुलर के पेड़ों की पैदावार की जा रही है। जिसपर वित्त नियन्त्रक द्वारा अवगत कराया गया कि मा० कुलपति जी द्वारा दिये गये निर्देशों के क्रम में क्षेत्र के किसानों को पोपुलर के अतिरिक्त शीशम, सागोन, आवंला, औषधिवर्धक वृक्षों को लगाने हेतु जागरूक किया जा रहा है।


(कार्यवाही: निदेशक शोध/निदेशक प्रसार)

8. डा० अमरनाथ मिश्रा, संयुक्त निदेशक कृषि, मेरठ मण्डल, मेरठ द्वारा अभिमत व्यक्त किया गया कि विश्वविद्यालय प्रशासन द्वारा कृषि विज्ञान केन्द्रों को उनके क्षेत्र के अनुसार कैटेगरी में बांटते हुए फसलों की पैदावार हेतु स्पेशलाइज्ड किया जाये। इस पर मा० कुलपति जी द्वारा अवगत कराया गया कि विश्वविद्यालय के अधीनस्थ कुल 06 कृषि विज्ञान केन्द्रों पर सेन्टर ऑफ एक्सीलेन्स के अन्तर्गत भिन्न-भिन्न फसलों पर कार्य किये जाने के लिए स्पेशलाइज्ड बनाये जाने के प्रयास किये जा रहे हैं। इसके मा० कुलपति जी द्वारा मा० सदस्यों को यह भी अवगत कराया गया कि कृषि विज्ञान केन्द्रों द्वारा प्राप्त किये जा रहे Revenue पर के०वी०के० के क्षेत्रफल के आधार भी Monitoring की जा रही है।


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9. डा० आर०के० गुप्ता, क्षेत्रीय उच्च शिक्षा अधिकारी द्वारा अभिमत व्यक्त किया गया कि क्षेत्र के सरकारी महाविद्यालय, जिनमें बॉटनी इत्यादि की पढ़ाई करायी जा रही है, उनमें रिसर्च के उपयुक्त साधन उपलब्ध नहीं है। ऐसी स्थिति में इन छात्र/छात्राओं को विश्वविद्यालय द्वारा रिसर्च/अन्य सुविधा उपलब्ध करायी जा सकती है। इस पर मा० कुलपति जी द्वारा अवगत कराया गया कि अगर क्षेत्र के महाविद्यालय इस पर रुचि लेते हैं तो विश्वविद्यालय द्वारा सहयोग प्रदान किया जायेगा।

10. मा० प्रबन्ध परिषद के समस्त सदस्यों द्वारा अभिमत व्यक्त किया गया कि कृषि विश्वविद्यालय, मेरठ द्वारा पश्चिमी उत्तर प्रदेश के कृषि कॉलेजों/संस्थानों को Affiliation दिये जाने हेतु प्रयास किये जाने चाहिए। जिस पर मा० कुलपति जी द्वारा सहमति व्यक्त करते हुए इस पर प्रयास करने हेतु शासन को संदर्भित किया जायेगा, ऐसा मा० सदस्यों को आश्वस्त किया गया।


(कार्यवाही: कुलसचिव/निदेशक प्रशासन एवं अनुश्रवण)

11. डा० अमरनाथ मिश्रा, संयुक्त निदेशक कृषि, मेरठ मण्डल, मेरठ द्वारा अभिमत व्यक्त किया गया कि कृषि विभाग द्वारा ए०पी०सी० की गौष्ठियां चौधरी चरण सिंह विश्वविद्यालय में आयोजित की जा रही है जहां पर उक्त गौष्ठियां आयोजित कराने हेतु काफी अच्छी सुविधायें प्राप्त हो जाती हैं। जबकि कृषि विश्वविद्यालय, मेरठ ए०पी०सी० बैठक के स्तर का कोई हॉल/व्यवस्था उपलब्ध नहीं है। इस पर मा० कुलपति जी द्वारा आश्वस्त किया गया कि



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विश्वविद्यालय के गांधी हॉल को ऐसे कार्यक्रमों को कराने हेतु तैयार किया जायेगा।

(कार्यवाही: वित्त नियन्त्रक/कुलसचिव/
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12. श्रीमती लक्ष्मी मिश्रा, वित्त नियन्त्रक द्वारा दिनांक 16.12.2022 को आयोजित होने वाले विश्वविद्यालय के 15वें दीक्षांत समारोह के आयोजन हेतु किराये के आधार पर लिये जा रहे साउण्ड सिस्टमों पर हो रहे व्यय के दृष्टिगत अभिमत व्यक्त किया गया कि ऐसे साउण्ड सिस्टमों एवं सहयोगी उपकरणों/सामग्री को विश्वविद्यालय द्वारा क्रय किया जाना उपयुक्त होगा। चूंकि विश्वविद्यालय में प्रतिवर्ष दीक्षांत समारोह के साथ-साथ किसान मेले के आयोजन, विभिन्न सेमिनार इत्यादि का आयोजन होता रहता है। जिसपर मा0 प्रबन्ध परिषद के सदस्यों के साथ-साथ मा0 कुलपति जी द्वारा भी अपनी सहमति व्यक्त की गयी।

(कार्यवाही: वित्त नियन्त्रक/कुलसचिव/
प्रभारी अधिकारी निर्माण/प्रभारी अधिकारी, आई0टी0)

अन्त में सचिव मा0 प्रबन्ध परिषद द्वारा अध्यक्ष महोदय एवं सभी माननीय सदस्यों का आभार व्यक्त किया और धन्यवाद के साथ बैठक समाप्त की गई।


(लक्ष्मी मिश्रा)

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अनुमोदित


(डा० के०के० सिंह)

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