Sixth Semester Syllabus of B.Sc. Agriculture
# Semester-wise distribution of B.Sc.(Ag.) courses

## VIth Semester

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Course No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Farming System, Precision Fanning &amp; Sustainable Agriculture</td>
<td>2 (1 + 1)</td>
<td>AG - 601</td>
</tr>
<tr>
<td>2</td>
<td>Crop Improvement-II (Rabi)</td>
<td>2 (1 + 1)</td>
<td>AG - 602</td>
</tr>
<tr>
<td>3</td>
<td>Manures, Fertilizers and Soil Fertility Management</td>
<td>3 (2 + 1)</td>
<td>AG - 603</td>
</tr>
<tr>
<td>4</td>
<td>Farm Management, Production &amp; Resource Economics</td>
<td>2 (1 + 1)</td>
<td>AG - 604</td>
</tr>
<tr>
<td>5</td>
<td>Diseases of Field and Horticultural Crops and their Management-II</td>
<td>3 (2 + 1)</td>
<td>AG - 605</td>
</tr>
<tr>
<td>6</td>
<td>Post-harvest Management and Value Addition of Fruits and Vegetables</td>
<td>2 (1 + 1)</td>
<td>AG - 606</td>
</tr>
<tr>
<td>7</td>
<td>Watershed and Wasteland Management</td>
<td>2 (1 + 1)</td>
<td>AG - 607</td>
</tr>
<tr>
<td>8</td>
<td>Management of Beneficial Insects</td>
<td>3 (2 + 1)</td>
<td>AG - 608</td>
</tr>
<tr>
<td>9</td>
<td>Elective Course-2 (AG-61/ AG-62/ AG-63/ AG-64/ AG-65/ AG-66)</td>
<td>3 (2 + 1) each</td>
<td>AG - 61-66</td>
</tr>
<tr>
<td>10</td>
<td>Educational Tour</td>
<td>2 (0 + 2)</td>
<td>AGT - 609</td>
</tr>
</tbody>
</table>

**TOTAL** 24
Farming System Precision Fanning and Sustainable Agriculture

**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, Sustainable agriculture-problems and its impact on agriculture, conservation agriculture strategies in agriculture, HEIA, LEIA and LEISA and its techniques, Integrated farming system, 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.

**Practical**

Tools for determining productions and efficiencies in cropping and farming system, Indicators of sustainability of cropping and farming systems, Site specific development of IFS models for different agro-climatic zones, Visit of IFS models in different agro-climatic zone of near by universities/institutes and farmers field.
GENETICS AND PLANT BREEDING

Crop Improvement – II (Rabi)

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.

Practical

Floral biology, emasculation and hybridization techniques in different crop species namely Wheat, Oat, Chickpea, Field pea, Horse gram, Rapeseed Mustard, Sunflower, Potato, Sugarcane, Tomato, 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.
Manures, Fertilizers and Soil Fertility Management

Theory


Practical

AGRICULTURAL ECONOMICS

Farm Management, Production and Resource Economics

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 farms. 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 labour income and farm business income. 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. Crop/livestock/machinery insurance features, determinants of compensation.

Practical

Preparation of farm layout. Determination of cost of fencing of a farm. Computation of depreciation cost of farm assets. Application of equi-marginal returns/opportunity cost principle in allocation of farm resources. Determination of least cost combination of inputs. Preparation of farm plan and budget, farm records and accounts and profit & loss accounts. Collection and analysis of data on various resources in India.
PLANT PATHOLOGY

Diseases of Field & Horticultural Crops & their Management-II  
AG-605-3(2+1)

Theory

Symptoms, etiology, disease cycle and management of following diseases: Field Crops: Wheat: rusts, loose smut, karnal bunt, powdery mildew, Alternaria blight, and ear cockle; Sugarcane: red rot, smut, wilt, grassy shoot, ratoon stunting and Pokkah Boeng; 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: anthracnose, vascular wilt, and black arm; Pea: downy mildew, powdery mildew and rust. Horticultural Crops: Mango: anthracnose, malformation, bacterial blight and powdery mildew; Citrus: canker and gummosis; Grape vine: downy mildew, Powdery mildew and anthracnose; Apple: scab, powdery mildew, fire blight and crown gall; Peach: leaf curl. Strawberry: leaf spot Potato: early and late blight, black scurf, leaf roll, and mosaic; Cucurbits: downy mildew, powdery mildew, wilt; Onion and garlic: purple blotch and Stemphylium blight; Chillies: anthracnose and fruit rot, wilt and 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.

Note: Students should submit 50 pressed and well-mounted specimens.
HORTICULTURE

Post-harvest Management and Value Addition of Fruits and Vegetables

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

SOIL SCIENCE & AGRICULTURAL CHEMISTRY

Watershed and Wasteland Management

Theory

Watershed management, concept, need, principles and components of watershed management integrated watershed management. Factors affecting watershed management runoff and soil loss management in a watershed socio-economic concept of watershed. People's participation in watershed management, Policy, approaches and management plan, problems of watershed management. Wasteland management - definition, concept and types of degraded and wasteland. Distribution and extent watershed in India and Uttar Pradesh, factors responsible for land degradation, characteristics of different types of degradation and wasteland problems of degraded land in Uttar Pradesh. Appropriate techniques for management of different types of degraded and waste land.

Practical

Characterization and delineation of model watershed. Field demonstration on soil and moisture conservation measures. Field demonstration of construction of water harvesting structures. Visit to rainfed research station/watershed.
ENTOMOLOGY

Management of Beneficial Insects

Theory


Practical

Protected Cultivation

ELECTIVE COURSES

Theory


Practical

Raising of seedlings and saplings under protected conditions, use of protrays in quality planting material production, Bed preparation and planting of crop for production, Inter cultural operations, Soil EC and pH measurement, Regulation of irrigation and fertilizers through drip, fogging ad misting.
ELECTIVE COURSES

Micro propagation Technologies

Theory

Introduction, History, Advantages and limitations; Types of cultures (seed, embryo, organ, callus, cell), Stages of micropropagation, Axillary bud proliferation (Shoot tip and meristem culture, bud culture), Organogenesis (callus and direct organ formation), Somatic embryogenesis, cell suspension cultures, Production of secondary metabolites, Somaclonal variation, Cryopreservation.

Practical

Identification and use of equipments in tissue culture Laboratory, Nutrition media composition, sterilization techniques for media, containers and small instruments, sterilization techniques for explants, Preparation of stocks and working solution, Preparation of working medium. Culturing of explants: Seeds, shoot tip and single node, Callus induction, Induction of somatic embryos regeneration of whole plants from different explants, Hardening procedures.
ELECTIVE COURSES
Hi-tech. Horticulture
AG-63-3(2+1)

Theory

Introduction & importance; Nursery management and mechanization; micro propagation of horticultural crops; Modern field preparation and planting methods, Protected cultivation: advantages, controlled conditions, method and techniques, Micro irrigation systems and its components; EC, pH based fertilizer scheduling, canopy management, high density orcharding, Components of precision farming: Remote sensing, Geographical Information System (GIS), Differential Geo-positioning System (DGPS), Variable Rate applicator (VRA), application of precision farming in horticultural crops (fruits, vegetables and ornamental crops); mechanized harvesting of produce.

Practical

Types of polyhouses and shade net houses, Intercultural operations, tools and equipments identification and application, Micro propagation, Nursery-protrays, micro-irrigation, EC, pH based fertilizer scheduling, canopy management, visit to hi-tech orchard/nursery.
ELECTIVE COURSES

Weed Management

Theory


Practical

ELECTIVE COURSES

System Simulation and Agroadvisory

AG-65-3(2+1)

Theory

System Approach for representing soil-plant-atmospheric continuum, system boundaries, Crop models, concepts & techniques, types of crop models, data requirements, relational diagrams. Evaluation of crop responses to weather elements; Elementary crop growth models; calibration, validation, verification and sensitivity analysis. Potential and achievable crop production-concept and modelling techniques for their estimation. Crop production in moisture and nutrients limited conditions; components of soil water and nutrients balance. Weather forecasting, types, methods, tools & techniques, forecast verification; Value added weather forecast, ITK for weather forecast and its validity; Crop-Weather Calendars; Preparation of agro-advisory bulletin based on weather forecast. Use of crop simulation model for preparation of Agro-advisory and its effective dissemination.

Practical

ELECTIVE COURSES

Agricultural Journalism

AG-66-3(2+1)

Theory

Agricultural Journalism: The nature and scope of agricultural journalism. Characteristics and training of the agricultural journalist, how agricultural journalism is similar to and different from other types of journalism. Newspapers and magazines as communication media: Characteristics; kinds and functions of newspapers and magazines, characteristics of newspaper and magazine readers. Form and content of newspapers and magazines: Style and language of newspapers and magazines, parts of newspapers and magazines. The agricultural story: Types of agricultural stories, subject matter of the agricultural story, structure of the agricultural story. Gathering agricultural information: Sources of agricultural information, interviews, coverage of events, abstracting from research and scientific materials, wire services, other agricultural news sources. Writing the story: Organizing the material, treatment of the story, writing the news lead and the body, readability measures. Illustrating agricultural stories: Use of photographs, use of artwork (graphs, charts, maps, etc.), writing the captions. Editorial mechanics: Copy reading, headline and title writing, proofreading, layouting.

Practical

Practice in interviewing. Covering agricultural events. Abstracting stories from research and scientific materials and from wire services. Writing different types of agricultural stories. Selecting pictures and artwork for the agricultural story. Practice in editing, copy reading, headline and title writing, proofreading, layouting. Testing copy with a readability formula. Visit to a publishing office.