# LIST OF POST GRADUATION COURSES (AGRONOMY)

| Name of semester | Sl. No. | Course title | Course code | Course credit hours |
|---|---|---|---|---|
| M. Sc. Ag I Semester | 1 | Fundamentals of Statistics and Computer Applications | J-1004 | 4-0-1 |
|  | 2 | Modern Concepts of Crop Production | J-1005 | 4-0-1 |
|  | 3 | *Kharif* Crops | J-1006 | 4-0-1 |
|  | 4 | Management of Problem Soils | J-1007 | 4-0-1 |
|  | 5. | Practicals | J-505 | 0-0-4 |
|  |  |  |  |  |
| M. Sc. Ag II Semester | 1 | Statistical Methods and Experimental Designs | J-2004 | 4-0-1 |
|  | 2 | Principles and Practices of Water Management | J-2005 | 4-0-1 |
|  | 3 | Soil Fertility Management and Fertilizer Use | J-2006 | 4-0-1 |
|  | 4 | *Rabi* Crops | J-2007 | 4-0-1 |
|  | 5. | Practicals | J-605 | 0-0-4 |
|  |  |  |  |  |
| M. Sc. Ag III Semester | 1 | Principles and Practices of Weed Management | J-3004 | 4-0-1 |
|  | 2 | Agronomy of Fodder, Forage, Medicinal and Aromatic Plants | J-3005 | 4-0-1 |
|  | 3 | Soil Conservation and Watershed Management | J-3006 | 4-0-1 |
|  | 4 | Organic Farming | J-3007 | 4-0-1 |
|  | 5. | Practicals | J-705 | 0-0-4 |
|  |  |  |  |  |
| M. Sc. Ag IV Semester | 1 | Dry Land Agronomy | J-4004 | 4-0-1 |
|  | 2 | Agroforestry and Sustainable Agriculture | J-4005 | 4-0-1 |
|  | 3 | Crop Ecology and Geography | J-4006 | 4-0-1 |
|  | 4 | Seed Production Agronomy | J-4007 | 4-0-1 |
|  | 5 | Practicals | J-805 | 0-0-4 |
|  |  |  |  |  |

# Course outcome of post graduation courses department of Agronomy

**Course Title** : **Fundamentals of Statistics and Computer Applications**
**Code** : **J-1004**
**Class** : **M. Sc. Ag I Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. The course provides basic idea about sampling techniques in biometrical researches,data collection and interpretation.

2. Provides knowledge regarding different measures to central tendency and dispersion and makes the students able to use these parameters in biometrical researches.

3. Creates skill among students regarding developing correlation and regression among different dependent and independent factors.

4. Familiarise knowledge among the students about basic understanding of computer accessories.

5. Helps in developing capability of using computer in research and data analysis.

6. Develops practical ability of sampling techniques from larger statistical communities.

7. To develop practical ability for estimation of mean, median, mode, mean deviation, standard deviation, variance and co-variance.

8. Makes the students able for practical estimation of correlation and regression among two factors of study.

9. Creates practical ability and expertise regarding EXEL sheet creation formula based computation, tabulation and Graph preparations.

10. Creates ability of group massaging, power point presentation and abstracting of information through internet.

**Course Title** : **Modern Concepts of Crop Production**
**Code** : **J-1005**
**Class** : **M. Sc. Ag I Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. Students develop a specific understanding about Agriculture and Agronomy and interrelationship with different branches and disciplines of Agriculture.

2. Helps students in understanding of different traditional as well as moderns Agronomic techniques and their scientific relevance's in crop production.

3. Develops an understanding about essential plants nutrients their metabolic roles in plants their specific deficiency symptoms and strategies to maintain soil fertility for higher and sustained productivity.

4. Helps the students to develop a basic understanding about efficient utilization of our scare water resources. So as to maintain its availability as well as usability for our future generation to come.

5. Familiarise the students in understanding the role of different climatic, biotic & management factors on the plant growth developments, yield and nutritional quality.

6. Provides opportunity to study different monitory and non monitory factors of crop production and their quantification.

7. Develop skill among students for analysis of growth in reference to applied biometrical situations.

8. Creates practical ability among students for identification of different weeds, manure, fertilizers and Agrichemicals.

9. Computation of input requirements (manures, fertilizers, seeds, weedicide etc) for given areas.

10. Yield and expected profit estimation with the help of post harvest data from large areas.

**Course Title     :  *Kharif* Crops**
**Code            :  J-1006**
**Class           : M. Sc. Ag I Sem.**
**Course credit   : 4-0-1**
**Course outcome:**

1. For developing understanding regarding area, distribution, geography and  common biology of *Kharif* crops in  Indian states and India in particular and world in general.

2. .For creating specific awareness among students regarding climatic and edaphic requirements of crops and their cultivars.

3. Helpful in creating ability among students for realizing /understanding agronomic and socioeconomic constraints in the production of Kharif crops and developing strategies to overcome the various crop specific constraints.

4. To familiarize students regarding scientific production techniques of *Kharif* crops. For achieving higher quantity and quality of produce.

5. Helps the students in providing comprehensive knowledge regarding diagnosis /identification of crop disease, harmful insect, pests and weeds and developing appropriate management strategies.

6. Practical awareness about weeds found in different *Kharif* crops.

7. Familiarize the students about the field symptoms of *Kharif* crop diseases.

8. To develop practical approach in identification of harmful *Kharif* crop insect pests.

9. Helps in developing ability among students about calculation of seed, weedicide, insecticide, requirement for given areas.

10. Helps in developing ability for crops related survey and data base generation regarding production, productivity with the help of post harvest data.

**Course Title** : **Management of Problem Soils**
**Code** : **J-1006**
**Class** : **M. Sc. Ag I Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. Familiarise knowledge regarding different forms of soil problems their causes of formation and their area and distribution in India and Indian states.

2. Helps the students to learn about basic physico-chemical phenomena/processes governing soil physico-chemical and biological health, fertility and productivity.

3. Familiarise the knowledge regarding soil flora and fauna and their role in maintaining hospitability of soil environment for crop plants.

4. Helpful in developing ability among students in understanding transformation of different nutrient elements and the factors affecting these transformations.

5. Provides opportunity to learn about management of saline, alkaline, acidic, water logged and ravines in reference to economic and sustained crop production.

6. Provides practical knowledge to run glass electrode. pH meter, electrical conductivity meter *etc*. for the diagnosis of soil chemical problems.

7. Helpful in acquiring understanding about use of soil survey equipments for efficient land use and planning.

8. Creates ability to decide the kind and quantity of soil reclamants for the given set of agroclimatic situations and crops.

9. Creates practical ability to judge the quality of irrigation water and the strategies for the use of poor quality irrigation water.

10. Provides on farm practical ability to diagnose the soil sickness and problems through visible field appearances.

**Course Title** : **Statistical Methods and Experimental Designs**
**Code** : **J-2004**
**Class** : **M. Sc. Ag II Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. Familiarise the knowledge among students regarding different tests of statistics ( F, T and Chi square test) and their use in agricultural researches.

2. The course provides basic idea about sampling techniques and collection of experimental data, its tabulation and statistical representation.

3. Provides comprehensive knowledge regarding different experimental designs (CRD, RBD, LSD, Factorial RBD, SPD), their specific considerations and their use in agronomic researches.

4. Creates skill among students regarding developing ANOVA format and designing, layout and statistical representation of result for different experimental designs.

5. Helps in developing capability of using computer in research and data analysis.

6. Develops practical ability of sampling techniques, tabulation and statistical analysis manual as well as through computer.

7. To develop practical ability for graphical representation, statistical result explanation and scientific script writing.

8. Creates practical ability and expertise regarding EXEL sheet creation formula based computation, tabulation and graph preparations.

**Course Title** : **Principles and Practices of Water Management**
**Code** : **J-2005**
**Class** : **M. Sc. Ag II Sem.**
**Course credit** : **4-0-1**
**Course outcome**:

1. Provides comprehensive idea about water resources of world, India and Indian states.

2. Familiarise the knowledge of the students regarding behaviour of water in soil, plant and atmosphere system( SPAC system).

3. Develops skill among students in designing of situation specific irrigation methods and modules.

4. Helpful in developing understanding for answer of three ultimate questions when to irrigate? how to irrigate? and how much to irrigate?.

5. Helpful in dissipating understanding about care and maintenance of irrigation resources as a planner and canal distributaries and field channels as a user.

6. To develop understanding regarding causes of poor efficiency of mega and minor irrigation projects.

7. Develops understanding about necessity of drainage for harnessing efficiency of irrigation projects and elimination of several soil problems.

8. Develops practical approach among students for measurement of water content in soil and water system.

9. Helpful in developing idea about quantity of water needed for a particular crop in a single irrigation as well as during entire crop period

10. Helpful in developing skill among students regarding designing and demonstration of irrigation methods at farm level.

11. Practical idea regarding quantification of discharge and delivery of water from different water sources and calculation of duty of water.

**Course Title** : **Soil Fertility Management and Fertilizer Use**
**Code** : **J-2006**
**Class** : **M. Sc. Ag II Sem.**
**Course credit** : **4-0-1**
**Course outcome**:

1. Develops capacity to understand the forces responsible for weathering and soil formation and its significance for maintenance of life forms on the earth planet.
2. Helps the students to learn about basic physico-chemical phenomena/processes governing soil fertility and productivity
3. Familiarise the knowledge regarding soil flora and fauna and their role in maintaining hospitability of soil environment for crop plants.
4. Helpful in developing ability among students in understanding transformation of different nutrient elements and the factors affecting these transformations.
7. Familiarise comprehensive knowledge about essential plants nutrients their metabolic roles in plants, their specific deficiency symptoms and strategies to maintain soil fertility for higher and sustained productivity.
8. Provide insight knowledge about IPNM (Integrated Plant Nutrient Management) and its necessity for sustenance of life and agricultural production system.
9. Helpful in creating practical ability among students regarding diagnosis of soil problems and developing situation specific plan for their reclamation.
10. Provides opportunity to the students to learn different scientific approaches of soil quality enhancement through visit to different research stations of national repute.
11. Creates practical ability for determination of nutrient content in soils and plants and calculation regarding uptake of nutrients.

**Course Title** : *Rabi* **Crops**
**Code** : **J-2007**
**Class** : **M. Sc. Ag II Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. For developing comprehensive understanding regarding area distribution and geography of *Rabi* crops among Indian states and India in particular and world in general.
2. For creating specific awareness among students about climatic and edaphic requirements of *Rabi* crops and their cultivars.
3. Helpful in creating ability to understand different agronomic and socioeconomic constraints in the production of different *Rabi* crops and developing core strategies to overcome various crop specific problems.
4. To familiarize the students regarding scientific production techniques of *Rabi* crops for achieving higher quantity and quality of produce.
5. Help the students in gaining comprehensive knowledge regarding diagnosis/identification of *Rabi* crop diseases harmful insects and weeds and developing appropriate management strategies to control them.
6. Creates practical awareness about prevalence of weeds in different *Rabi* crops.
7. Familiarize the students about visible field symptoms for the diseases of *Rabi* crops.
8. To develop practical approach in identification of harmful *Rabi* crop insects.

9. Helpful in developing skill among students about calculation of seeds, weedicide, insecticide etc requirement for given practical situations.

10. Helps in developing ability of macro crop related survey and database generation regarding area, production and productivity of crops.

11. Makes the student capable to develop entrepreneur attitude in boosting of national production and economy.

**Course Title**   : **Principles and Practices of Weed Management**
**Code**   : **J-3005**
**Class**   : **M. Sc. Ag III Sem.**
**Course credit**   : **4-0-1**
**Course outcome:**

1. Students would be able to identify weed species and understand their biological behaviour in reference to crop weed competition.

2. Familiarise the knowledge regarding control and management of weeds on crop lands as well as urban and industrial land scapes.

3. Creates ability among students in designing and development of cost and environment friendly integrated approach for weed management under different crops for different Agronomic situations.

4. To develop skill in students pertaining to scientific approach for evolution and evaluation of chemical weedicides for given set of crop and crop environment.

5. Also enables the students to understand the expected future challenges regarding weed control and management.

6. Helps in practical screening of season and crop wise weed flora.

7. Inculcate practical understanding regarding different weedicidal application equipments, their care and maintenance and precautions required while handling of equipments.

8. Creates practical ability in quantification of herbicidal dose for given set of weed control situations.

9. Helps in developing practical skill among students for studding extent of yield loss due to weeds.

10. Develops practical and scientific ability in designing of techniques for estimation of effectiveness of weed control treatments.

11. Creates scientific arena, confidence and attitude for planning of weed control experiments.

**Course Title**   : **Agronomy of Fodder, Forage, Medicinal and Aromatic Plants**
**Code**   : **J-3006**
**Class**   : **M. Sc. Ag III Sem.**
**Course credit**   : **4-0-1**
**Course outcome:**

1. Developing comprehensive understanding regarding area, distribution and geography of different forage, fodder and medicinal plants among Indian states and India in particular and world in general.

2. For creating specific awareness among students about climatic and edaphic requirements of forage, fodder and medicinal plants and their cultivars and specific importance of medicinal and aromatic plants in human health and national economy.

3. Helpful in creating ability to understand different agronomic and socioeconomic constraints in the production of different forage, fodder and medicinal plants and developing core strategies to overcome various crop specific problems.

4. To familiarize the students regarding scientific production techniques of forage, fodder and medicinal crops for achieving higher quantity and quality of produce.

5. Help the students in gaining comprehensive knowledge regarding diagnosis/identification of forage, fodder and medicinal plant diseases, harmful insects and weeds and developing appropriate management strategies to control them.

6. Creates practical awareness about prevalence of weeds in different forage, fodder and medicinal crops.

7. Familiarize the students about visible field symptoms for the diseases of forage, fodder and medicinal plants.

8. To develop practical approach in identification of harmful forage, fodder and medicinal plants insects.

9. Helpful in developing skill among students about calculation of seeds, weedicide, insecticide etc requirement for given practical situations.

10. Helps in developing ability of macro crop related survey and database generation regarding area, production and productivity of crops.

11. Creates practical ability for the processing of medicinal and aromatic plants for their economic products.

**Course Title** : **Soil Conservation and Watershed Management**
**Code** : **J-3007**
**Class** : **M. Sc. Ag III Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. Develops capacity to understand the forces responsible for weathering and soil formation and its significance for soil genesis and development and maintenance of life forms on the planet.

2. Helps the students to learn about basic physico-chemical phenomena/processes governing soil fertility and productivity.

3. Helpful in developing ability among students for deep understanding about watershed and developing watershed based approach to solve various farm as well as community problems.

4. Familiarise knowledge regarding different forms of soil erosion, factors affecting erosions and strategies to control different forms of soil erosion.

5. Envisages the sense and tendency of watershed based approach among students to cope the problems of soil and water conservation, efficient marketing and rationalized resource utilization.

6. Familiarise the understanding of Land Capability Classification and its significance in land use and planning studies.

7. Develops practical ability among students in quantification of soil and water loss from an area.

8. Helps in designing and development of soil and water conservation structures and their management.

9. Helpful in acquiring understanding about use of soil survey equipments for efficient land use and planning.

10. Helpful in creating practical ability among students regarding diagnosis of soil erosions and developing situation specific plan for their control.

11. Provides opportunity to the students to learn different scientific approaches of soil quality enhancement through visit to different research stations of national repute.

**Course Title** : **Organic Farming**
**Code** : **J-3008**
**Class** : **M. Sc. Ag III Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. To familiarise the knowledge and understanding among students regarding future format of agriculture in India and world for sustainability of agricultural production system and environment.

2. To make students familiar about ill consequences of faulty agricultural practices performed during recent pasts and to develop ability to overcome them.

3. To develop a sense and attitude of sustainability through adoption of organic farming among student's mind set for achieving food, environment, employment, nutritional and resource security.

4. Helps in familiarising the scope of organic farming, its limitations future prospects in Indian sub continent.

5. To develop a comprehensive understanding about agriculture and its allied entrepreneurs as a whole.

6. To create an ability of designing and development of situation specific agri-entrepreneur combination to solve soil complications, improve farm and national income and to increase employment.

7. To develop an ability among students about to study the practical feasibility of different agri entrepreneurs in an area.

8. For developing practical proficiency among students for green manuring, vermi-composting, crop residue management city and farm composting techniques and biofertilizer applications.

9. Helpful in practical designing and evaluation of farming system modules for a given set of agro-ecological situation.

10. Makes students able to design organic production technology for different crops under different set of agro-environment.

**Course Title** : **Dry Land Agronomy**
**Code** : **J-4005**
**Class** : **M. Sc. Ag IV Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. The course provides basic idea about trend of land use pattern in the country.

2. Provides knowledge regarding limited availability of irrigation water in India and Indian states and helps in developing an ultimate sense to save water to meet our demand as well as demand of our future generations to come.

3. Familiarise the students about to understand different crop related constraints under dry land, water logged and rainfed situations.

4. Helps in developing situation specific crop management strategies to meet nation's goal of food security and resource sustainability.

5. To develop capability among students for evolution and adoption of contingent crop plans against extremes of weather.

6. Envisages the sense and tendency of watershed based approach among students to cope the problems of soil and water conservation, efficient marketing and rationalized resource utilization.

7. Helps in practical understanding about constraints in crop production observed under drought and water logging prone areas.

8. To develop practical ability for quantification of soil loos, soil moisture retention and determination of bulk and particle density in the soils.

9. Practical development and demonstration of soil and water conservation structures, their maintenance and estimation of construction cost.

10. Creates practical ability among students to determine critical growth stages of crops and the extent of yield loss and gain under shortage of irrigation.

**Course Title** : **Agroforestry and Sustainable Agriculture**
**Code** : **J-4006**
**Class** : **M. Sc. Ag IV Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. Emphasizes the importance of trees and forestry in meeting farm family multiple needs and conservation and restoration of soils and environment for sustained agricultural proiduction.

2. Helps to develop a sense focusing importance of trees described through a sloke in *Rigveda*

" *Dus Kup sama Wapi, dus Wapi sama Hadah,*

*Dus Had Vanshputro, Vansputra sama Taruh*" .

3. Familiarises knowledge regarding raising forest nursery, its maintenance and plantation techniques of forests on farm boundaries and social sites.

4. To make students familiar about ill consequences of faulty agricultural practices performed during recent pasts and to develop ability to overcome them.

5. To develop a sense and attitude of sustainability among students mind set for achieving food, environment, employment, nutritional and resource security.

6. Helps in developing ability to identify appropriate agroforestry trees under different agro ecological situations.

7. Provides basic understanding regarding rejuvenation of natural forests and rationalized delivery and discharge of services from forests to meet our as well as our future generation's needs.

8. Develops self reliance of entrepreneur among students through adoption of forest nursery raising and agro-forestry.

9. Practical identification of agroforestry trees and study of their biological behaviour.

10. Creates ability among students for economic analysis and comparison of agro-forestry systems with existing farming systems.

11. Helpful in developing practical skill of cutting, grafting, layring for maintenance and development of desired tree characters.

**Course Title   :  Crop Ecology and Geography**
**Code            : J-4007**
**Class           : M. Sc. Ag IV Sem.**
**Course credit   : 4-0-1**
**Course outcome:**

1. To gain in-depth knowledge among students on natural processes involved in our environment, that sustain life and economy.

2. To develop an understanding about consequences of faulty human activities on the environment and web of life, economy and quality of human life.

3. Familiarises comprehensive knowledge regarding geographical distribution of different crops and their cultivars in India and world.

4. To familiarize the students about succession and adoption of different crop species under different agro ecological situations.

5. For acquiring values and attitude towards understanding environmental, socioeconomic changes and participation actively in solving environmental problems for the benefit of our as well as future generations to come.

6. To make the students capable to understand situation specific crop production related environmental issues and to develop core strategies.

7. Practical understanding about different ecosystems and their components.

8. Familiarise the students about lithospheric and water pollution in particular and creates ability for appropriate means to handle the problem.

9. Help the students in developing techniques about studying succession of weed, and crop species in different agro environmental situations.

10. Helps in developing soil and water pollution controlling modules at farm as well as at community level.

11. Develops ability in the quantification of pollutants presence in the system.

**Course Title** : **Seed Production Agronomy**
**Code** : **J-4008**
**Class** : **M. Sc. Ag IV Sem.**
**Course credit** : **4-0-1**
**Course outcome:**

1. To gain in-depth knowledge and understanding about histology and morphology of mono and dicot seeds.

2. To develop an understanding about importance of quality seeds and achievements due to introduction of high yielding varieties in India and world.

3. Provides basic understanding about classes of different seeds, and their agronomic production and quality maintenance.

4. Familiarises comprehensive knowledge regarding commercial seed production of different crops and their cultivars.

5. Creates ability among students for analysis of seed quality with the help of parameter *i.e.* physical purity, germination percent, real value of seeds etc.

6. Makes the students capable for histological studies of seeds.

7. Practical ability among students about seed production through mass selection, and indepth knowledge of production of hybrid and composite seeds.

8. Creates ability among students for practical quality analysis of seed testing parameters for large number of seed samples and data maintenance.

9. Develops practical skill of seed viability testing, accelerated aging test for determination of seed quality.