

**CAREER  
OPPORTUNITIES  
In  
B.Sc. (Hons.)  
Agriculture  
&  
M.Sc. Ag. (Agronomy)**



# **Galgotias University**

## **School of Agriculture**



# Agriculture: Programs

**B.Sc.  
(Hons.)  
Agriculture**

**M.Sc. Ag.  
(Agronomy)**

# Vision

**To be recognized globally for value based, socially driven learning through innovation and research in the field of agricultural sciences.**

# Mission

**Mission 1: To establish state of the art facilities for education and research using advanced technologies.**

**Mission 2: The efficient delivery of high quality content by experienced faculties who ensure the concept of lifelong learning.**

**Mission 3: To develop unique academic curriculum designed throughout the interaction with the major stakeholders like industry and professional societies.**



# **Programme Educational Objectives**

**PEO1: Graduates of agriculture shall lead in the agriculture and allied industries during the services and entrepreneurship.**

**PEO2: Graduates of agriculture shall effectively identify and design sustainable solution to address responsibilities and Global opportunities.**

**PEO3: Graduates of agriculture shall be successful professional careers in agro industries, government organization, educational and research Institutions.**

# Programme Specifics Outcome

**PSO1: To Develop the ability to know farming practices and their scope to improve the rural development through technology based approaches.**

**PSO2: Embellish the students with specialization in smart agricultural systems through integrated farming system, skill based program should be added. vertical farming, hydroponics, multi-layer farming, aeroponics, use of information and communication technologies, agriculture automation, robotics, Weather forecasting systems, remote sensing and GIS techniques etc.**

# VII - SEMESTER

## Rural Agricultural Work Experience & Agro-Industrial Attachment (RAWE & AIA)

# VIII - SEMESTER

S. No.	Course Code	Course Title	Week	L	T	P	C
1.	AGRI4001	General orientation & On campus training by different faculties	1	0	0	4	2
2.	AGRI4002	Village attachment	8	0	0	1 0	5
3.	AGRI4003	Unit attachment in Univ./ KVK/ Research Station/Agro-Industrial Attachment	8	0	0	1 0	5
4.	AGRI4004	Plant clinic	2	0	0	8	4
5.	AGRI4005	Project Report Preparation, Presentation and Evaluation	1	0	0	8	4
6.	Total weeks and credit for RAWE & AIA		20	0	0	4 0	2 0

S. No.	Course Code	Title of the module	Number of weeks	L	T	P	C
1.	AGRI4006	Mushroom Cultivation Technology	12	0	0		
2.	AGRI4007	Seed Production Technology	12				
Total weeks and Credits			24	0	0		



# Elective Courses - 4<sup>th</sup>, 5<sup>th</sup> & 6<sup>th</sup> Semesters

S. No.	Courses	Credit Hours
1.	Agribusiness Management	3(2+1)
2.	Agrochemicals	3(2+1)
3.	Commercial Plant Breeding	3(2+1)
4.	Landscaping	3(2+1)
5.	Food Safety and Standards	3(2+1)
6.	Bio pesticides & Bio fertilizers	3(2+1)
7.	Protected Cultivation	3(2+1)
8.	Micro propagation Technologies	3(2+1)
9.	Hi-tech. Horticulture	3(2+1)
10.	Weed Management	3(2+1)
11.	System Simulation and Agro-advisory	3(2
12.	Agricultural Journalism	3(2

# Examination and Evaluation System (Theory)

Sl. No.	Examination	Minimum	Maximum	Scale Down
1.	Mid - Term Examination	0	40	40
2.	Assignment	0	10	10
3.	End-Term Examination	0	50	50
Total	100			

## Practical

Sl. No.	Examination	Minimum	Maximum	Scale Down
1.	Internal Practical	0	100	100
Total	100			

## Theory and Practical

Sl. No.	Examination	Minimum	Maximum	Scale Down
1.	Mid - Term Examination	0	30	30
2.	Assignment	0	05	05
3.	Practical	0	50*	15
4.	End-Term Examination	0	50	50
Total	100			

# **Marks Distribution in End - Term Practical Examination\***

- 1. Field based activities in crop cafeteria - 20 marks**
- 2. Viva - voice - 05 marks**
- 3. Practical records - 10**
- 4. Reports (Academic visit) - 05**
- 5. Written examination in practical - 10A**

Degree	Percentage of Marks Obtained	Conversion into Points
All	100	10 Points
	90 to <100	9 to <10
	80 to <90	8 to <9
	70 to <80	7 to <8
	60 to <70	6 to <7
	50 to <60	5 to <6
	<50 (Fail)	<5
	eg. 80.76	8.076
	43.60	4.360
	72.50 (but shortage in attendance)	Fail (1 point)

OGPA	Division
5.000 - 5.999	Pass
6.000 - 6.999	II division
7.000 - 7.999	I division
8.000 and above	I division with distinction

**GPA = Total points scored / Total credits (for 1 semester)**

**CGPA =  $\Sigma$  Total points scored / Course credits**

**OGPA =  $\Sigma$  Total points scored (after excluding failure points)/ Course credits**

**Percentage of Marks = OGPA x 100/10**

# Why Study Agriculture

1. Ten acre crop cafeteria in the University Campus for research and development activities.
2. Interdisciplinary research approach.
3. Well established laboratory for practical exercise.
4. All faculties are doctorates and experienced.
5. The course curriculum as ICAR 5<sup>th</sup> Deans Committee Recommendations.
6. Better job placements.
7. Opportunity for Business in Agriculture.



## **JOB OPPORTUNITIES AFTER GRADUATION IN AGRICULTURE COURSE**

- 1. There are plenty of government as well as private sector jobs available for BSc Agriculture graduates.**
- 2. They can be appointed as Research Officer, Quality Assurance Officer, Agriculture Officer, Agriculture Loan Officer (in Banks), Production Manager, Operations Manager and Farm Manager with State agriculture departments.**
- 3. In the private sector, agriculture science graduates may find jobs as managers at plantations, as officers at fertilizer manufacturing firms, agriculture machinery industries, agricultural products marketing firms, food processing units etc.**
- 4. The average starting salary of these officers is generally between Rs 5 to 6 lakh per annum (including incentive).**
- 5. And as you gain years and experience, the scope for better remuneration is immense.**
- 6. After doing BSc Agriculture, one may also go for MSc in Agriculture and take up a teaching job, or even go for PhD and build a career in Agricultural Research.**

## Post-graduate Program: M.Sc. Ag. (Agronomy)

**M.Sc. Ag. (Agronomy)** is a two-year Post-graduate course that ingrains highly developed understanding of agronomic structure and advanced analytical skill.

### **Eligibility:**

**A bachelor's degree in the respective/related subjects.**

**1. 6.00/10 or equivalent OGPA/equivalent percentage of marks for general category candidates and 5.50/10 or equivalent OGPA/equivalent percentage of marks for SC/ST/PH category candidates at Bachelor's degree level. Those who are coming from the 3-year Bachelor Degree stream should undergo one year remedial programme before registering for regular courses.**

**Fees structure: INR 80,000/-**

**Duration: Two year (4 Semesters)**

## **Carrier prospectus:**

**Agronomist studies involve in the plant breeding and its application in terms of human being utilization.**

**The commercialization of horticulture and agriculture, career opportunities in both government and private sectors in the discipline have increased. The successful post-graduates of the course are hired in the different areas as:**

**1. Agriculture Loan Officers 2. Department of Land Affairs 3. Farm Services Agency 4. Bureau of Land Management 5. Cooperative Extension Service 6. Agricultural Technicians 7. Veterinarians 8. Graders 9. Farming Statisticians 10. Agricultural Consultants**

**11. Crop Consultants 12. Commodity Traders 13. Soil Scientists 14. Environmental Consultants 15. Fertilizer and Chemical Salespersons 16. Grain Elevator Managers 17. Precision Agriculture Specialists 18. Natural Resources Conservation Service 19. Production Specialists 20. Researchers 21. Farm Manager 22. Civil Services.**



- 1. On the recommendations of the National Core Group (NCG) the The Indian Council of Agricultural Research (ICAR) constituted 18 Broad Subject Matter Area Committees (BSMAC).**
- 2. Each BSMAC comprised of about 10 eminent subject-matter specialists/academicians, who were authorized to revise and rewrite the PG course curricula for updating, futuristic outlook and built-in possibility for re-strengthening as per need and appropriateness.**



1. **Major subject:** The subject (School of Agriculture) in which the students takes admission.
2. **Minor subject:** The subject closely related to students major subject (e.g., if the major subject is Entomology, the appropriate minor subjects should be Plant Pathology & Nematology).
3. **Supporting subject:** The subject not related to the major subject. It could be any subject considered relevant for student's research work.
4. **Non-Credit Compulsory Courses:** Please see the relevant section for details. Six courses (PGS 501-PGS 506) are of general nature and are compulsory for Master's program. Ph.D. students may be exempted from these courses if already studied during Master's degree.

# AGRONOMY

## Course Structure – at a Glance

CODE	COURSE TITLE	CREDITS
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	AGROMETEOROLOGY AND CROP WEATHER FORECASTING	2+1
AGRON 506	AGRONOMY OF MAJOR CEREALS AND PULSES	2+1
AGRON 507	AGRONOMY OF OILSEED, FIBRE AND SUGAR CROPS	2+1
AGRON 508	AGRONOMY OF MEDICINAL, AROMATIC AND UNDER UTILIZED CROPS	2+1
AGRON 509	AGRONOMY OF FODDER AND FORAGE CROPS	2+1
AGRON 510	AGROSTOLOGY AND AGROFORESTRY	2+1
AGRON 511	CROPPING SYSTEMS	2+0
AGRON 512	DRYLAND FARMING	2+1
AGRON 513	PRINCIPLES AND PRACTICES OF ORGANIC FARMING	2+1
AGRON 591	MASTER'S SEMINAR	
AGRON 599	MASTER'S RESEARCH	

# **AGRONOMY**

## **Course Contents**

**AGRON 501                      MODERN CONCEPTS IN CROP PRODUCTION                      3+0**

### **Objective**

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

### **Theory**

#### **UNIT I**

Crop growth analysis in relation to environment; agro-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.

#### **UNIT V**

Integrated farming systems, organic farming, and resource conservation technology including modern concept of tillage; dry farming; determine the nutrient needs for yield potentiality of crop plants, concept of balanced nutrition and integrated nutrient management; precision agriculture.



## Suggested Readings

- Balasubramaniyan P & Palaniappan SP. 2001. *Principles and Practices of Agronomy*. Agrobios.
- Fageria NK. 1992. *Maximizing Crop Yields*. Marcel Dekker.
- Havlin JL, Beaton JD, Tisdale SL & Nelson WL. 2006. *Soil Fertility and Fertilizers*. 7<sup>th</sup> Ed. Prentice Hall.
- Paroda R.S. 2003. *Sustaining our Food Security*. Konark Publ.
- Reddy SR. 2000. *Principles of Crop Production*. Kalyani Publ.
- Sankaran S & Mudaliar TV. 1997. *Principles of Agronomy*. The Bangalore Printing & Publ.
- Singh SS. 2006. *Principles and Practices of Agronomy*. Kalyani.



## COMPULSORY NON-CREDIT COURSES

(Compulsory for Master's programme in all disciplines; Optional for Ph.D. scholars)

CODE	COURSE TITLE	CREDITS
PGS 501	LIBRARY AND INFORMATION SERVICES	0+1
PGS 502	TECHNICAL WRITING AND COMMUNICATIONS SKILLS	0+1
PGS 503 (e-Course)	INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE	1+0
PGS 504	BASIC CONCEPTS IN LABORATORY TECHNIQUES	0+1
PGS 505 (e-Course)	AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMMES	1+0
PGS 506 (e-Course)	DISASTER MANAGEMENT	1+0



## **AGRONOMY**

### **List of Journals**

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>• Advances in Agronomy</li><li>• Agriculture, Ecosystems and Environment</li><li>• Agricultural Systems</li><li>• Agricultural Water Management</li><li>• Agronomy Journal</li><li>• Annual Review of Plant Physiology</li><li>• Applied Ecology and Environment Research</li><li>• Australian Journal of Agricultural Research</li><li>• Australian Journal of Experimental Agriculture</li><li>• Crop Protection</li><li>• Environment and Ecology</li><li>• European Journal of Agronomy</li><li>• Fertilizer Research</li><li>• Field Crops Research</li><li>• Indian Journal of Agricultural Sciences</li><li>• Indian Journal of Agronomy</li><li>• Indian Journal of Ecology</li><li>• Indian Journal of Weed Science</li></ul> | <ul style="list-style-type: none"><li>• Irrigation Science</li><li>• Japanese Journal of Crop Science</li><li>• Journal of Agronomy</li><li>• Journal of Applied Ecology</li><li>• Journal of Experimental Botany</li><li>• Journal of Farming Systems Research</li><li>• Journal of Range Management</li><li>• Journal of Agricultural Science Cambridge</li><li>• Journal of Sustainable Agriculture</li><li>• Netherlands Journal of Agricultural Sciences</li><li>• Nutrient Cycling in Agroecosystems</li><li>• Pesticide Biochemistry and Physiology</li><li>• Plant and Soil</li><li>• Plant Production Science</li><li>• Soil and Tillage Research</li><li>• Swedish Journal of Agricultural Research</li><li>• Tropical Agriculture</li><li>• Weed Research</li></ul> |
|--|--|



## **Suggested Broad Topics for Master's and Doctoral Research**

- Crop diversification under different agricultural situations
- Development of farming systems for marginal, small and other farmers
- Agricultural information at door step/click of mouse
- Farm-specific nutrient management
- Weed management in different cropping/farming systems
- Nutrient studies in different cropping/farming systems
- Biodiversity of farming systems for conservation
- Organic farming systems for different regions
- Modeling for different crop situations
- Conservation agriculture for yield sustainability
- Role of edaphic factors on weeds proliferation and management
- Implications of global warming on weed growth and herbicide behaviour
- Ecological implications of using thresholds for weed management
- Effect of cultivation practices and herbicides on weed flora shift
- GM crops and weed management strategies
- Weed management under reduced moisture regime in major summer/kharif
- Avoidance of herbicide resistance using IWM



# Examination and Evaluation System

## Maximum permissible course workload per semester

Master's Programme	18 credits
Doctoral Programme	18 credits

## Attendance requirements

Minimum 75%, to be counted separately for theory and practical both at M. Sc. and Ph. D. levels

## Course evaluation

Theory – Internal

Practical – Internal, to be conducted by the course teacher + one more teacher to be nominated by the HOD

## Comprehensive Examination

Should be allowed after completion of 75% course work separately in major and minor subjects)

	Master's Programme	Doctoral Programme
Major subject	One paper	Two papers
Minor subject	One paper	One paper
Paper setting	Internal	Internal
Evaluation	External	External
Qualifying marks	60%	60%
Viva Voce	No	External
Grading	Satisfactory/Unsatisfactory	

## Approval of synopsis

Should be accomplished in the first semester both for Masters' and Doctoral Programmes.

## Time between Synopsis and Thesis submission

Master's Programme: One semester  
Doctoral Programme: Two years

## Thesis

	Master's Programme	Doctoral Programme
i. Submission	After thesis seminar	(i) After thesis seminar (ii) One research paper should have been accepted and second submitted or one patent filed out of thesis work
ii. Evaluation	External (One examiner)	External (Two examiners)
iii. Viva Voce	By Advisory Committee	By Advisory Committee and one external examiner
iv. Assessment	Satisfactory/Unsatisfactory	Satisfactory/Unsatisfactory





# SCOPE FOR AGRIBUSINESS IN INDIA

1. India is endowed with varied agro-climate, which facilitates production of temperate, sub-tropical and tropical agricultural commodities.
2. There is growing demand for agricultural inputs like feed and fodder, inorganic fertilizers, biofertilizers.
3. Biotechnology applications in agriculture have vast scope in production of seed, bio-control agents, industrial harnessing of microbes for bakery products.
4. Export can be harnessed as a source of economic growth. As a signatory of World Trade Organization, India has vast potential to improve its present position in the World trade of agricultural commodities both raw and processed form.
5. The products line include cereals, pulses, oilseeds and oils, oil meal, spices and condiments, fruits and vegetables, flowers, medicinal plants and essential oils, agricultural advisory services, agricultural tools and implements, meat, milk and milk products, fish and fish products, ornamental fish, forestry products.



6. At present processing is done at primary level only and the rising standard of living expands opportunities for secondary and tertiary processing of agricultural commodities.
7. The vast coastal line and internal water courses provides enormous opportunity for production of marine and inland fish and ornamental fish culture gaining popularity with increase in aesthetic value among the citizens of India.
8. The livestock wealth gives enormous scope for production of meat, milk and milk products, poultry products etc.
9. The forest resources can be utilized for production of byproducts of forestry.
10. Beekeeping and apiary can be taken up on large scale in India.
11. Mushroom production for domestic consumption and export can be enhanced with improvement in the state of art of their production.
12. Organic farming has highest potential in India as the pesticide and inorganic fertilizer application are less in India compared to industrial nations of the world. The farmers can be encouraged and educated to switch over for organic farming.

13. There is wide scope for production and promotion of bio-pesticides and bio-control agents for protection of crops.
14. Seeds and hybrid crops, have the highest potential in India in the future, since the productivity of high yielding varieties have reached a plateau.
15. Micro-irrigation systems and labor saving farm equipments have good potential for the years to come due to declining groundwater level and labor scarcity for agricultural operations like weeding, transplanting and harvesting.
16. Production of vegetables and flowers under green house conditions can be taken up to harness the export market.
17. Trained human resources in agriculture and allied sciences will take on agricultural extension system due to dwindling resources of state finance and downsizing the present government agricultural extension staff as consulting services.
18. The enhanced agricultural production throws open opportunities for employment in marketing, transport, cold storage and warehousing facilities, credit, insurance and logistic services.

# Emerging Agriculture Technologies



1. Soil and Water Sensors
2. Weather Tracking
3. Satellite Imaging
4. Pervasive Automation
5. Mini chromosomal Technology
6. RFID Technology
7. Vertical Farming
8. Artificial Intelligence (AI) and Machine Learning
9. Plant Genomics
10. Harvest Strategies During Peak Nutrient Growth
11. Food Tracking to Reduce Recalls
12. Vertical Farming in the Urban Backyard
13. Agri - techture: The Next Big Thing
14. Drones
15. Livestock Tracking Software
16. Soil moisture sensors (irrigation) plant and soil health
17. Ever-evolving processing technology
18. Remote Monitoring
19. Security



# FUTURE TRENDS IN AGRICULTURE

01



## Data Analytics

With the help of Data Analysis, farmers can make decisions based upon the data like, which crops to plant for next harvest

02



## Biotechnology

With the help of genetic engineering, molecular diagnostics and tissue culture living organisms like plants and microorganisms can be modified to increase productivity.

03



## Sensors

With help of sensing technologies and gathered data can help farmers monitor and optimize the crops as well as adapt to changing environmental factors.



04



## Using Internet of Things (IoT)

With the help of IoT technologies growers and farmers can reduce waste and enhance productivity

05



## Crop Monitoring using Drones

Drones can be used to monitor crops from an aerial source as a means to combat drought and other harmful environmental factors.

06



## Machine Learning

Machine learning can predict which traits will be best for crop production, giving farmers the best breed for their location and climate.

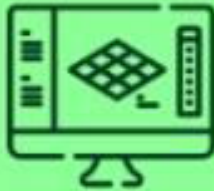
07



## Blockchain Technology

Blockchain technology can be used to record and update the status of crops from planting to harvest to storage to delivery.

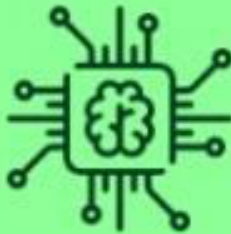
08



## 3D Printing

3D Printing can help farmers manufacture traditional tools and equipment. This is exactly a technique used by farmers in Myanmar.

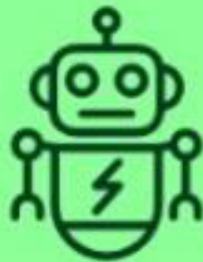
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## Artificial Intelligence

Artificial Intelligence can be used for crop monitoring, predictive agricultural analytics and supply chain efficiencies.

10



## Robotics

Robots can be used as laser and camera guidance for identifying and removing weeds without human intervention

**THANK YOU ALL FOR  
YOUR VALUABLE  
SUGGESTIONS**

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