

**Detailed Course Scheme**  
**Bachelor of Science (Hons.)**  
**Agriculture**

**Semester- III**  
**(2020- 21)**

DOC202002250017



**RNB GLOBAL UNIVERSITY**

RNB Global City, Ganganagar Road,  
Bikaner, Rajasthan 334601

## **OVERVIEW**

RNB Global University follows Semester System along with Choice Based Credit System as per latest guidelines of University Grants Commission (UGC). Accordingly, each academic year is divided into two semesters, **Odd (July-December) and Even (January-June)**. Also, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The Curriculum for B. Sc Agriculture Program along with examination pattern is as follows:

### **Course Scheme**

#### **Semester -III**

<b>S.No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1.	20012200	Crop Production Technology – I (Kharif Crops)	1	0	0	1
2.	20012300	Crop Production Technology – I Lab (Kharif Crops)	0	0	2	1
3.	20012400	Soil & water Conservation Engineering	2	0	0	2
4.	20012500	Soil & water Conservation Engineering Lab	0	0	2	1
5.	20012600	Agricultural Finance and Cooperation	2	0	0	2
6.	20012700	Agricultural Finance and Cooperation Lab	0	0	2	1
7.	20012800	Agri- Informatics	1	0	0	1
8.	20012900	Agri- Informatics Lab	0	0	2	1
9.	20013000	Farm Machinery and Power	1	0	0	1
10.	20013100	Farm Machinery and Power lab	0	0	2	1
11.	20013200	Production Technology for Vegetables and Spices	1	0	0	1
12.	20013300	Production Technology for Vegetables and Spices Lab	0	0	2	1
13.	20013400	Fundamentals of Crop Physiology	2	0	0	2
14.	20013500	Fundamentals of Crop Physiology Lab	0	0	2	1
15.	20013600	Fundamentals of Plant Pathology	3	0	0	3
16.	20013700	Fundamentals of Plant Pathology Lab	0	0	2	1
17.	20013800	Livestock and Poultry Management	3	0	0	3
18.	20013900	Livestock and Poultry Management Lab	0	0	2	1
19.	20014000	Agriculture Heritage & Human Values & Ethics	0	0	0	2
20.	20014100	Ability and Skill Enhancement -III	2	0	0	2
21.	99002800	Workshops & Seminars	-	-	-	1
22.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
<b>Total</b>			<b>18</b>	<b>0</b>	<b>18</b>	<b>31</b>

## **EVALUATION SCHEME - THEORY**

The evaluation of the theory paper of B.Sc. Agriculture program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

### **Internal Assessment**

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+: 5 marks	5
<b>TOTAL</b>	<b>50</b>	

### **External Assessment**

Type	Marks
Theory	50

## **EVALUATION SCHEME - PRACTICAL**

The evaluation of the practical paper of B.Sc. Agriculture program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

### **Internal Assessment**

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	45
Attendance	75%+: 5 marks	5
<b>TOTAL</b>	<b>50</b>	

### **External Assessment**

Type	Marks
Practical	50

### **EVALUATION SCHEME- WORKSHOPS & SEMINARS & NCC/NSS**

1. NCC/NSS will be completed from Semester I – Semester IV. It will be evaluated internally by the institute. The credit for this will be given at the end of Semester.
2. The students have to join club/clubs with the active participation in different activities of club. The students would be continuously assessed from Semester-I to Semester-IV and credits and marks would be given after the end of Semester.

### **CURRICULUM**

**Course Name: Crop Production Technology – I (Kharif Crops)**

**Course Code: 20012200**

#### **Course Outline**

##### **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.

## **Course Name: Crop Production Technology – I Lab (Kharif Crops)**

**Course Code: 20012300**

### **Course Outline**

1. 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.
2. 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.
3. Study of forage experiments, morphological description of kharif season crops, visit to research centres of related crops.

## **Course Name: Soil & Water Conservation Engineering**

**Course Code: 20012400**

### **Course Outline**

#### **Unit I**

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.

#### **Unit II**

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.

## **Course Name: Soil & Water Conservation Engineering Lab**

**Course Code: 20012500**

### **Course Outline**

1. Study of different types and forms of water erosion. Exercises on computation of rainfall erosivity index. Computation of soil erodibility index in soil loss estimation.

2. Determination of length of slope (LS) and cropping practice (CP) factors for soil loss estimation by USLE and MUSLE. Exercises on soil loss estimation/measuring techniques. Study of rainfall simulator for erosion assessment.
3. Estimation of sediment rate using Coshocton wheel sampler and multi slot devisor. Determination of sediment concentration through oven dry method.
4. Design and layout of contour bunds.
5. Design and layout of graded bunds.
6. Design and layout of broad base terraces.
7. Design and layout of bench terraces.
8. Design of vegetative waterways.
9. Exercises on rate of sedimentation and storage loss in tanks.
10. Computation of soil loss by wind erosion.
11. Design of shelterbelts and wind breaks for wind erosion control.
12. Visit to soil erosion sites and watershed project areas for studying erosion control and water conservation measures.

**Course Name: Agricultural Finance and Cooperation**

**Course Code: 20012600**

**Course Outline**

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 institutions – 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, marketing, consumer and multi-purpose cooperatives, farmers' service cooperative societies, processing cooperatives, farming cooperatives, cooperative warehousing; role of ICA, NCUI, NCDC, NAFED.

**Course Name: Agricultural Finance and Cooperation Lab**

**Course Code: 20012700**

**Course Outline**

**Practical**

1. Determination of most profitable level of capital use. Optimum allocation of limited amount of capital among different enterprise.

2. Analysis of progress and performance of cooperatives using published data. Analysis of progress and performance of commercial banks and RRBs using published data.
3. Visit to a commercial bank, cooperative bank and cooperative society to acquire firsthand knowledge of their management, schemes and procedures.
4. 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.
5. Appraisal of a loan proposal- A case study.
6. Techno-economic parameters for preparation of projects. Preparation of Bankable projects for various agricultural products and its value-added products. Seminar on selected topics.

## **Course Name: Agri- Informatics**

**Course Code: 20012800**

### **Course Outline**

#### **Unit I**

Introduction to Computers, Operating Systems, definition and types, Applications of MSOffice 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.

#### **Unit II**

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 price, postharvest management etc.

#### **Unit III**

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

### **Suggested Readings**

1. Sinha, P.K. Computer Fundamentals (BPB Publications).
2. Niranjana Mansal and Jayshri Saraogi Computer Made Easy For Beginners (Hindi).
3. Satish Jain, Shashank Jain and Madhullika Jain. It Tools and Applications (BPB Publications).
4. MS Office 2000. Joe Habraken.
5. Rapidex Computer Course (Pustak Mahal)
6. Davinder Singh Minhas- Dynamic Memory Computer Course (Fusin Books), New Delhi.

## **Course Name: Agri- Informatics Lab**

**Course Code: 20012900**

### **Course Outline**

1. Study of Computer Components, accessories, practice of important DOS Commands.
2. 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.
3. MS-EXCEL - Creating a spreadsheet, use of statistical tools, writing expressions, creating graphs, analysis of scientific data.
4. MS-ACCESS: Creating Database, preparing queries and reports, demonstration of Agri-information system.
5. Introduction to World Wide Web (WWW).
6. Introduction of programming languages.
7. Hands on Crop Simulation Models (CSM) such as DSSAT/Crop-Info/CropSyst/Wofost;
8. Computation of water and nutrient requirements of crop using CSM and IT tools.
9. Introduction of Geospatial Technology for generating valuable information for Agriculture.
10. Hands on Decision Support System.
11. Preparation of contingent crop planning.

## **Course Name: Farm Machinery and Power**

**Course Code: 20013000**

### **Course Outline**

#### **Unit I**

Status of Farm Power in India, Sources of Farm Power , I.C. engines, working principles of IC 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: 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.

#### **Unit II**

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.

### **Suggested Readings:**



1. Principles of Farm Machinery – Roy Bainer, R.A. Kepner, E.L. Barger
2. Farm Machinery and Equipment – C.P. Nakra
3. Elements of Farm Machinery – J. Sahay

**Course Name: Farm Machinery and Power Lab**

**Course Code: 20013100**

**Course Outline**

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

**Course Name: Production Technology for Vegetables and Spices**

**Course Code: 20013200**

**Course Outline**

Importance of vegetables & spices in human nutrition and national economy, kitchen gardening, brief about origin, area, climate, soil, improved varieties and cultivation practices such as time of sowing, transplanting techniques, planting distance, fertilizer requirements, irrigation, weed management, harvesting and yield, physiological disorders, of important vegetable and spices (Tomato, Brinjal, Chilli, Capsicum, Cucumber, Melons, Gourds, Pumpkin, French bean, Peas; Cole crops such as Cabbage, Cauliflower, Knol-khol; Bulb crops such as Onion, Garlic; Root crops such as Carrot, Raddish, Beetroot; Tuber crops such as Potato; Leafy vegetables such as Amaranth, Palak. Perennial vegetables).

**Course Name: Production Technology for Vegetables and Spices Lab**

**Course Code: 20013300**

**Course Outline**

1. Identification of vegetables & spice crops and their seeds. Nursery raising.
2. Direct seed sowing and transplanting.
3. Study of morphological characters of different vegetables & spices.
4. Fertilizers applications. Harvesting & preparation for market. Economics of vegetables and spices cultivation.

**Course Name: Fundamentals of Crop Physiology**

**Course Code: 20013400**

**Course Outline**

Introduction to crop physiology and its importance in Agriculture; Plant cell: an Overview; Diffusion and osmosis; Absorption of water, transpiration and Stomatal Physiology; Mineral nutrition of Plants: Functions and deficiency symptoms of nutrients, nutrient uptake mechanisms; Photosynthesis: Light and Dark reactions, C3, C4 and CAM plants; Respiration: Glycolysis, TCA cycle and electron transport chain; Fat Metabolism: Fatty acid synthesis and Breakdown; Plant growth regulators: Physiological roles and agricultural uses, Physiological aspects of growth and development of major crops: Growth analysis, Role of Physiological growth parameters in crop productivity.

**Course Name: Fundamentals of Crop Physiology Lab**

**Course Code: 20013500**

**Course Outline**

1. Study of plant cells, structure and distribution of stomata, imbibitions, osmosis, plasmolysis, measurement of root pressure, rate of transpiration, Separation of photosynthetic pigments through paper chromatography.
2. Rate of transpiration, photosynthesis, respiration, tissue test for mineral nutrients, estimation of relative water content, Measurement of photosynthetic CO<sub>2</sub> assimilation by Infra-Red Gas Analyzer (IRGA).

**Course Name: Fundamentals of Plant Pathology**

**Course Code: 20013600**

**Course Outline**

Introduction to the science of phytopathology, its objectives, scope and historical background. Classification of plant diseases, symptoms, signs, and related terminology. Parasitic causes of plant diseases (fungi, bacteria, viruses, phytoplasma, protozoa, algae and flowering parasitic plants), their characteristics and classification. Non-parasitic causes of plant diseases. Infection process. Survival and dispersal of plant pathogens. Plant disease epidemiology, forecasting and disease assessment. Principles and methods of plant disease management. Integrated plant disease management. Fungicides classification based on chemical nature, Commonly used fungicides, bactericides and nematocides.

### **Suggested Readings:**

1. N.G. Ravichandra, 2013. Fundamentals of Plant Pathology. PHI Hall of India, New Delhi
2. R.S. Mehrotra, Ashok Agarwal. Fundamental of Plant Pathology.
3. Sambamurthy A textbook of Plant Pathology.
4. R.S. Singh Introduction to principles of plant pathology
5. Alexopoulos, C.J. Mims, C.W. and Blackwell, M. 1996. Introduction to Mycology Wiley Eastern Ltd., New York.
6. Eastern Ltd., New York.
7. Mandahar, C.L. 1987. Introduction to Plant Viruses. Chand and Co. Pvt. Ltd., New Delhi
8. Mehrotra, R.S. and Aneja, K.R. 1990. An Introduction to Mycology. New Age International (P) Ltd., New Delhi.
9. Singh, R.S. 1982. Plant Pathogens - The Fungi. Oxford and IBH Publishing Co., New Delhi
10. Singh, R.S. 1989. Plant Pathogens - The Prokaryotes. Oxford and IBH Publishing Co., New Delhi.
11. Dhingra and Sinclair 1993. Basic Plant Pathology Methods. CBS, Publishers & Distributors, New Delhi.
12. Agrios, G.N. 2006. Plant Pathology. Elsevier Academic press, London

### **Course Name: Fundamentals of Plant Pathology Lab**

**Course Code: 20013700**

#### **Course Outline**

1. Familiarity with general plant pathological laboratory and field equipments.
2. Study of disease symptoms and signs and host parasite relationship.
3. Identification and isolation of plant pathogens. Koch's postulates.
4. Preparation of fungicidal solutions, slurries, pastes and their applications.

### **Course Name: Livestock and Poultry Management**

**Course Code: 20013800**

#### **Course Outline**

Role of livestock in the national economy. Reproduction in farm animals and poultry. Housing principles, space requirements for different species of livestock and poultry. Management of calves, growing heifers and milch animals. Management of sheep, goat and swine. Incubation, hatching and brooding. Management of growers and layers. Important Indian and exotic breeds of cattle, buffalo, sheep, goat, swine and poultry. Improvement of farm animals and poultry. Digestion in livestock and poultry. Classification of feedstuffs. Proximate principles of feed. Nutrients and their functions. Feed ingredients for ration for livestock and poultry. Feed supplements and feed

additives. Feeding of livestock and poultry. Introduction of livestock and poultry diseases. Prevention (including vaccination schedule) and control of important diseases of livestock and poultry.

**Course Name: Livestock and Poultry Management Lab**

**Course Code: 20013900**

**Course Outline**

1. External body parts of cattle, buffalo, sheep, goat, swine and poultry. Handling and restraining of livestock. Identification methods of farm animals and poultry.
2. Visit to IDF and IPF to study breeds of livestock and poultry and daily routine farm operations and farm records. Judging of cattle, buffalo and poultry.
3. Culling of livestock and poultry. Planning and layout of housing for different types of livestock.
4. Computation of rations for livestock. Formulation of concentrate mixtures.
5. Clean milk production, milking methods. Hatchery operations, incubation and hatching equipments.
6. Management of chicks, growers and layers. Debeaking, dusting and vaccination. Economics of cattle, buffalo, sheep, goat, swine and poultry production.

**Course Name: Agriculture Heritage & Human Values & Ethics**

**Course Code: 20014000**

**Course Outline**

**Unit I**

Introduction of Indian agricultural heritage; Ancient agricultural practices, Relevance of heritage to present day agriculture; Past and present status of agriculture and farmers in society; Journey of Indian agriculture and its development from past to modern era; Plant production and protection through indigenous traditional knowledge; Crop voyage in India and world; Agriculture scope; Importance of agriculture and agricultural resources available in India; Crop significance and classifications; National agriculture setup in India; Current scenario of Indian agriculture; Indian agricultural concerns and future prospects

**Course Name: Ability and Skill Enhancement III**

**Course Code: 20014100**

**Course Outline - Final Assessment – Preparing a documentary**

**Unit I: Book & Movie Reviews**

What is Book Review, Purpose & Importance of Book Review, Types of Book Review, Elements & Steps of Writing Book Review, What is Movie Review, Purpose & Importance of Movie Review, Types of Movie Review, Elements & Steps of Writing Movie Review.

**Unit II: LSWR Skills**

Reading Comprehension, Rewriting Mythology/Folklore, Debate, News Analysis, Role Plays.

**Unit III: Emotional Intelligence & Handling Emotions**

What is emotional intelligence, E.Q. Tests, performing under pressure, how to take right decisions under pressure keeping balance in difficult emotional situations. The science of emotional intelligence, characteristics of emotional intelligence, Emotions handling- identifying good and bad emotions, how to control emotions, how to manage negative emotions keeping balance of mental stability, stress and distress.

**Unit IV: Group Discussion Skills**

What is GD, Types of Group Discussions, Do's & Don'ts, Participation, Thinking, Structuring, Group Behaviour, Leadership Skills, Interpersonal Skills, Persuasive Skills, Conceptualization Skills.

**Unit V: Documentary Making**

What is documentary, aims & objectives, documentary for social cause, Documentary/Movie Screening & Reviews, preparing a documentary, Narration.

**Note:** The review of Syllabus happens on periodic basis for the benefit of the students. In case there are changes in curriculum due to review, students would be intimated in writing.

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