UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE' UNIVERSITY)
(Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section
Email: academicsectionju14@gmail.com

NOTIFICATION
(24/Aug./Adp./65)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the Syllabi and Courses of Studies of the subject of **B.Sc. Agriculture Technology** of Semester **I** for **Four Year Under Graduate Programme (FYUGP)** as per **NEP-2020 (as given in the annexure)** for the examinations to be held in the years **December 2024, 2025 and 2026.**

The Syllabi of the courses is also available on the University website: www.jammuuniversity.ac.in.

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/24/ 8859-73
Dated: 16/8/24

Copy for information and necessary action to:

1. Dean Faculty of Life- Science
2. Sr. P.A.to the Controller of Examinations
3. All members of the Board of Studies
4. Confidential Assistant to the Controller of Examinations
5. I/C Director, Computer Centre, University of Jammu
6. Deputy Registrar/Asst. Registrar (Conf. /Exams. UG)/(CDC)
7. Incharge, University Website for Uploading of the notification

Sumita Sharma 16/8/24
Deputy Registrar (Academic)

16/8/24 16/8/24

ANNEXURE-1b

University of Jammu

Course Scheme of Syllabus

Bachelor of Agricultur... Technology (General/Honors/Honors with Research)

(As per the Guidelines of National Education Policy-2020)

S No	Course Type	Course No.	Course Title	Credits	Marks				Total marks
					Theory		Practical		
					Mid Semester	End Exam	Assessment	Exam	
1.	Major	UMJATT101	Agricultural Microbiology	4(3T+1P)	15	60	10	15	100
2.	Minor	UMIATT102	Fundamentals of Agronomy	4(3T+1P)	15	60	10	15	100
3.	MDC	UMDATT103	Rural Sociology and Educational Psychology	3	15	60	NA	NA	75
4.	SEC	USEATT104	Nursery, Gardening and Horticulture Technology	2	5	40	NA	5	50

University of Jammu

Syllabi of Agricultural Technology for FYUGP under CBCS as per NEP-2020

SEMESTER-I

(Examination to be held in December 2024, 2025 & 2026)

Major Course

Course Code: UMJATT101
Credits: 04{03(Theory) + 01(Practical)}

Course Title: Agricultural Microbiology
Total no. of lectures: Theory: 45 hours
Practical: 30 hours

Maximum Marks: 100
Theory: 75
Practical/Tutorial: 25

Minor Course

Course Code: UMIATT102
Credits: 04{03(Theory) + 01(Practical)}

Course Title: Fundamentals of Agronomy
Total no. of lectures: Theory: 45 hours
Practical: 30 hours

Maximum Marks: 100
Theory: 75
Practical/Tutorial: 25

Multidisciplinary Course

Course Code: UMDATT103

Course Title: Rural Sociology and Educational Psychology
Total no. of lectures: Theory: 45

Credits: 03
hoursMaximum Marks: 75
Theory: 75

Skill Enhancement Course

Course Code: USEATT104

Course Title: Nursery, Gardening and Horticulture Technology

Credits: 02

Total no. of lectures: Theory/Practical: 45 hours
(15 hours)/(30 hours)

Maximum Marks: 50
Theory/Practical: 50

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN AGRICULTUR. TECHNOLOGY
UNDER CBCS AS PER NEP - 2020
(For the Examination to be held in Year 2024, 2025 & 2026)
(MAJOR COURSE)
UG SEMESTER-I

MAJOR CORE COURSE NO.	:	UMJATT101
MAJOR CORE COURSE TITLE	:	AGRICULTURAL MICROBIOLOGY
CREDITS	:	04 {03 (Theory) + 01 (Practical)}
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03 Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous assessment	:	10
II) Final examination	:	15

Objectives and Expected Learning Outcomes: The course is designed to familiarize the students with agriculture, agricultural technology and the role of microbes in agriculture. These microbial organisms are of great use in agriculture, horticulture, medical and biotechnology based industries. Therefore, students need to know about their structural diversity, biology and utilization.

Unit-I: Agriculture & its importance

1.1. History and origin of agriculture
1.2.Agriculture: its scope and importance in national economy.
1.3. Agricultural technology: Introduction; National & International agricultural research institutes in India.
1.4Agro climatic and agro-ecological zones of India; revolutions in agriculture.

Unit 2: Sustainable agriculture and microbes

2.1 Concept of sustainable agriculture. Precision agriculture. Concept of secondary agriculture
2.2 Introduction to microbial world: Prokaryotic and eukaryotic microbes.
2.3. General characters of plant and animal viruses. prions
2.4 Bacteria: cell structure, bacterial growth and nutrition (chemoautotrophy,photoautotrophy); Genetic recombination- transformation, conjugation and transduction

Unit 3:Role of microbes in Agriculture and human welfare

3.1.Role of microbes in soil fertility and crop production: Carbon, Nitrogen cycles
3.2.Biological nitrogen fixation- symbiotic, associative and asymbiotic.
3.3.Rhizosphere and phyllosphere; *Azolla*-Cyanobacteria and mycorrhiza.
3.4.Microbes in human welfare: silage production,biofertilizers, biopesticides, biofuel production and biodegradation of agro-waste.

Unit 4: Economic importance of microbes

4.1. Microbial technology in food and pharmaceutical industry
4.2. Microbial technology in bioremediation.

4.3 Bacterial and fungal diseases of plants

4.4 Viral diseases in plants (Tobacco Mosaic Virus, Potato Leaf Roll, Tomato Bunchy Top, Banana Bunchy Top Virus) and their management.

Practicals:

1.Introduction to microbiology laboratory and its equipment; Microscope- parts, principles of microscopy, resolving power and numerical aperture.

2. Methods of sterilization. Nutritional media and their preparations.

3. Enumeration of microbial population in soil- bacteria, fungi, cyanobacteria, Actinomycetes.

4. Methods of isolation and purification of microbial cultures.

5. Isolation of *Rhizobium* from legume root nodule.

5. Isolation of *Azotobacter* from soil. Isolation of *Azospirillum* from roots.

6. Gram's Staining technique for gram positive and gram negative bacteria

6. Identification of available algal specimens

7. Identification of fungal organisms: *Aspergillus, Penicillium, Alternaria, Curvularia, Agaricus, Morchella*

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be covered in Examination	Time allotted for Exar	Marks
Internal Theory Assessment	50%	1 Hr and 30 Min	15
External Theory End Semester	100%	3 Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final examination	-	-	15

External End Semester Theory Examination will have two sections (A & B) {Total marks 60}

Section A: Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.

Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks

Internal Assessment {Total marks 15}

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings:

1. Gopal Chandra De. 1980., Fundamentals of Agronomy. Oxford and IBH Publishing Co. Ltd., Bangalore.
2. Panda, S.C., 2006.Agronomy Agribios Publication, New Delhi.
3. Sumbali, G. (2010). The fungi. Alpha Science International, New Delhi. Pp.356
4. Sumbali, G. and Mehrotra, R.S (2017). Principles of Microbiology. Tata McGraw-Hill Education

5. Reddy, S.R. Principles of Agronomy Kalyani Publishers, Ludhiana, India.
6. Sankaran, S and Subbiah Mudliyar, V.T., 1991. Principles of Agronomy. The Bangalore Printing and Publishing Co. Ltd., Bangalore.
7. Saha, T and Tiwary, B.K. (2020). Microbes, Environment and Human Welfare. Nova Science Publishers
8. Tilak, K.V.B.R., Pal, K.K. and Dey, R., 2010. Microbes for sustainable agriculture. New Delhi: IK International.
9. Agrios, G.N., Plant pathology, Elsevier Publishers.
10. Wheeler, B. E. 1976. An Introduction to Plant Disease. ELBS and John Wiley and Sons, Ltd.
11. Subba Rao, N. S. 1997. Biofertilizers in Agriculture and Forestry, III Ed., Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
12. Subba Rao, N. S. 1995. Soil microorganisms and plant growth. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN AGRICULTUR TECHNOLOGY
UNDER CBCS AS PER NEP - 2020
(For the Examination to be held in Year 2024, 2025 & 2026)
(MINOR COURSE)
UG SEMESTER-I

MINOR CORE COURSE NO.	:	UMIATT102
MINOR CORE COURSE TITLE	:	FUNDAMENTALS OF AGRONOMY
CREDITS	:	04 {03 (THEORY) + 01 (Practical)}
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
DURATION OF UNIVERSITY EXAM	:	03Hours
MAXIMUM MARKS PRACTICALS	:	25
I) Continuous Assessment	:	10
II) Final Examination	:	15

Objectives and Expected Learning Outcomes: The course is designed to provide a thorough understanding of agronomy, crop management, water and weed management, and crop growth. It will equip the students to optimize crop production, manage resources efficiently, and apply modern technologies. By course end, students will effectively implement agronomic practices, manage water and irrigation, control weeds, and enhance crop productivity, addressing practical agricultural challenges for sustainable farming.

Unit 1:Principles of Agronomy and Crop Management

1.1 Agronomy and its scope, seeds and sowing, tillage and tilth
1.2 Crop density and geometry
1.3 Crop nutrition, manures and fertilizers
1.4 Nutrient use efficiency

Unit 2:Water Management in Agriculture

2.1 Water resources, soil-plant-water relationship
2.2 Crop water requirement, water use efficiency
2.3 Irrigation- scheduling criteria
2.4 Methods, quality of irrigation water, water logging

Unit 3:Weed Science and Management in Agriculture

3.1 Weeds- importance, classification
3.2 Crop weed competition, Top ten weeds of India and the world
3.3 Concepts of weed management; principles and methods,
3.4 Herbicides- classification, selectivity and resistance, allelopathy

Unit 4:Crop Growth, Development, and Management Strategies

4.1 Growth and development of crops, factors affecting growth and development, plant ideotypes
4.2 Crop rotation and its principles, adaptation and distribution of crops

4.3 Crop management technologies in problematic areas
4.4 Harvesting and threshing of crops (cereals, pulses and oilseeds).

Practicals:

1. To test the seed viability and germination rates under various conditions.
2. Testing various types and rates of fertilizers on crop nutrition and growth.
3. Measuring soil moisture levels and understanding soil-water relationships.
4. Identification and classification of common weeds in various crops.
5. Testing different herbicides for effectiveness, selectivity, and resistance.
6. Investigating the effects of allelopathic plants on weed growth.
7. Tracking and recording growth stages and development of various crops.

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be Covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1Hr& 30 Minutes	15
External Theory End Semester	100%	3Hrs	60
Continuous assessment	-	-	10 (Based on Daily Performance only)
Final Examination	-	-	15

External End Semester Theory Examination will have two sections (A&B) {Total marks: 60}
Section A : Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.
Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}
Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings:

1. Chhidda Singh, Modern techniques of raising field corps. Oxford and IBH Publishing Co. Ltd., Bangalore.
2. Gopal Chandra De. 1980., Fundamentals of Agronomy. Oxford and IBH Publishing Co. Ltd., Bangalore.
3. Hand book of Agriculture, ICAR Publication.
4. Palaniappan, S.P., Cropping Systems in the tropics – Principles and Practices. Willey Eastern Ltd., New Delhi
5. Panda, S.C., 2006.Agronomy Agribios Publication, New Delhi.
6. Reddy, S.R. Principles of Agronomy Kalyani Publishers, Ludhiana, India.
7. Sankaran, S and Subbiah Mudliyar, V.T., 1991. Principles of Agronomy. TheBangalore Printing and Publishing Co. Ltd., Bangalore.
8. Vaidya, V.G., Sahasrabuddhe, K.R. and Khuspe, V.S. Crop production and field experimentation. Continental Prakashan, Vijaynagar, Pune.
9. Rao V.S. (2006), Principles of Weed Science. Oxford and IBH Publishing Co., New Delhi, India.
10. Gupta, O.P. (2008), Modern Weed Management Agribios India Publication

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN AGRICULTUR TECHNOLOGY UNDER CBCS AS PER NEP - 2020
(For the Examination to be held in Year 2024, 2025 & 2026)
(MULTIDISCIPLINARY COURSE)
UG SEMESTER-I

MULTIDISCIPLINARY COURSE NO.	:	UMDATT103
MULTIDISCIPLINARY COURSE TITLE	:	RURAL SOCIOLOGY AND EDUCATIONAL PSYCHOLOGY
CREDITS	:	03
MAXIMUM MARKS	:	75
I) External (University Exam)	:	60
II) Internal Assessment	:	15
TIME DURATION	:	03 Hours

Objectives and Expected Learning Outcomes

The course is designed to provide students with a comprehensive understanding of sociological and psychological concepts relevant to agricultural extension and to apply these insights effectively. Students will gain the ability to analyze and integrate social and psychological factors to improve agricultural practices. By the end of the course, they will be able to apply theoretical knowledge to real-world challenges, critically assess the impact of these factors on rural societies, and develop practical solutions to enhance agricultural extension strategies.

Unit 1:Sociology and its Role in Agricultural Extension

1.1 Sociology: Definition and scope
1.2 Rural sociology: Definition and scope
1.3 Importance of Rural sociology in agricultural extension
1.4 Interrelationship between rural sociology and Agricultural Extension

Unit 2:Social Structure and Institutions in Rural Societies

2.1 Social groups- Meaning, definition, classification
2.2 Rural societies: Important characteristics, difference and relationship between rural and urban societies
2.3 Social Stratification- Meaning, Definition, Forms of social stratification,
2.4 Social Institutions- Meaning, Definition, Major institutions in rural society,

Unit 3:Educational Psychology in Agricultural Extension

3.1 Educational psychology: Definition and scope
3.2 Importance of educational psychology in Agricultural Extension
3.3 Behaviour: Cognitive, affective, psychomotor domain
3.4 Personality development and Learning types

Unit 4:Psychological Concepts in Agricultural Extension

4.1 Perception:- definition, role of perception in agricultural extension
4.2 Motivation:- definition, role of motivation in agricultural extension
4.3 Motivation, Theories of Motivation, Intelligence
4.4 Role of Social values and attitude in Agricultural Extension

NOTE FOR PAPER SETTING

Examination Theory/Practical	Syllabus to be Covered in Examination	Time allotted for Exam	Marks
Internal Theory Assessment	50%	1Hr& 30 Minutes	15
External Theory End Semester	100%	3Hrs	60

External End Semester Theory Examination will have two sections (A&B) {Total marks 60}
Section A: Four short answer questions representing all units/syllabi i.e., one question from each unit. Each question shall be of 3 marks.
Section B: Eight long answer questions (Four to be attempted) representing whole of the syllabi i.e., two questions from each unit. Each question shall be of 12 marks.

Internal Assessment {Total marks 15}
Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

Suggested Readings:

1. Ray, G.L. 2006. Extension Communication and Management. Naya Prakashan, Kolkata.
2. Dahama O. P. and Bhatnagar, O. P. - Education and Communication for Development
3. Sandhu A. S. -Textbook on Agricultural Communication
4. Chitambar, J. B.- Introductory rural sociology
5. R. Desai -Rural Sociology
6. Adivi Reddy, A. 2001. Extension Education. Sri Lakshmi Press, Bapatla.
7. Chitamber, J.B. 1997. Introductory Rural Sociology. Wiley Eastern Limited, New Delhi.
8. Daivadeenam, P. 2002. Educational Psychology in Agriculture. Agrotech Publishing Academy, Udaipur.
9. Mangal, S.K. 2000. Educational Psychology. Prakash Brothers, Ludhiana.
10. Vidyabhushan and Sach Dev, D.R. 1998. An Introduction to Sociology. Kitab Mahal Agencies, Allahabad.

UNIVERSITY OF JAMMU
SYLLABI AND COURSE OF STUDY IN AGRICULTUR TECHNOLOGY UNDER CBCS AS PER NEP - 2020
(For the Examination to be held in Year 2024, 2025 & 2026)
(SKILL ENHANCEMENT COURSE)
UG SEMESTER-I

SKILL ENHANCEMENT COURSE NO.	:	**USEATT104**
SKILL ENHANCEMENT COURSE TITLE	:	**NURSERY GARDENING AND HORTICULTURE TECHNOLOGY**
CREDITS	:	**02**
MAXIMUM MARKS THEORY	:	**50**
I) External (University Exam)	:	**40**
II) Internal Assessment	:	**10**
DURATION OF UNIVERSITY EXAM	:	**02 Hours30Minutes**

Objectives and Expected Learning Outcomes: The course is designed to equip students with a comprehensive understanding of nursery and gardening fundamentals, including plant nutrition, protection, and advanced propagation techniques. Students will learn to effectively manage nurseries and gardens, apply modern technologies, and enhance plant health and productivity. By the end of the course, they will be able to integrate practical knowledge and technological innovations to optimize operations and address challenges in plant care and management.

UNIT-I INTRODUCTION TO NURSERY AND GARDENING

1.1 Definition and types of nurseries. Physical resources for nurseries.
1.2. Selection of Nursery Site, Ecological Facts, Equipment and Implements used in nurseries and gardening, important nursery operations.
1.3. Components of gardens, types of gardening (landscape and home gardening), gardening operations (soil laying, manuring and watering).
1.4 Some famous gardens with specific reference to Kew Botanical Garden, United Kingdom and Acharya Jagadish Chandra Bose Indian Botanic Garden, Kolkata.

UNIT-II PLANT NUTRITION AND PLANT PROTECTION IN NURSERIES AND GARDENS

2.1 Plant nutrition, role of micro- and macronutrients.
2.2 Inorganic fertilizers, organic manures, Biofertilizers.
2.3. Integrated Pest management, pesticides, biopesticides, advantages and disadvantages.
2.4 Cultural and chemical methods of controlling fungal diseases and weeds.

UNIT-III PLANT PROPAGATION METHODS AND MANAGEMENT PROCEDURES

2.1 Sowing/raising of seeds and seedlings, transplanting of seedlings, causes and methods of breaking seed dormancy; seed germination, types and factors affecting it.
2.2 Vegetative propagation, artificial and natural methods; hydroponics and aeroponics technology.

2.3 Track and trace technologies such as Bar codes, Radio Frequency Identification (RFID), QR codes and GPS tags track plants through the production cycle to record seed germination and seedling survival rates; Technological innovations in packing, transport and marketing of nursery plants.

2.4 Smart technologies in the nursery industry: irrigation types, Water quality sensors; irrigation sensors, autonomous drones and robots

NOTE FOR PAPER SETTERS

Total Marks of the USEVTT-104 is 50 of which 50% marks shall be reserved for internal assessment (25 marks).

Remaining 50% of the marks (25 marks) shall be reserved for external examination to be conducted by the University/Colleges.

Internal Assessment Test (25 Marks) **Internal Assessment Paper** of 25 Marks shall consist of Theory Question/s of 20 Marks from Unit I/II and 5 Marks of Practical Exercise from Unit III.

External End semester University / College Examination External Theory Exam shall be of 25 Marks and consist of 2 sections:

Section A: Three (3) short answer questions atleast one question from each unit. Each question shall be of 2marks (All Compulsory)

Section B: Three (3) long answer questions: two questions (one from Unit-I and one from Unit-II), each of 6 marks; one question (practical-based/exercise from Unit-III), carrying 7 marks.

Suggested Readings:

- Floriculture in India by G.S. Randhava and Amitabha Mukhopadhyay Allied Publishers, PVT. Ltd. 1986.
- Plant Propagation Principles and Practices by Hartman H.T. Prentice-Hall International: London, 1959.
- Encyclopedia of Gardening by Christopher Brukell. Dorling Kindersley, Ltd. 2007.
- Propagation Hand Book; basic Techniques for Gardeners Mechanicsburg, Pas; stackpok Books, 1995. Horticulture,PrinciplesandPracticesbyGeorgeAcquaah.4thedition,PearsonPublisher,PrenticeHall, 2009.
- GardeninginIndiabyBose,T.KandMukerjee,D.NewDelhiOxford&IBHPub.Co.Pvt.Ltd,1977.Textbook of Horticulture by Mani Bhushan Rao. Macmillan India Ltd. 2005 (2nd edition).
- Introduction to Horticulture by Kumar, N. 7th edition, Oxford & IBH Publishing Company Pvt. Ltd. 2010.
- Introduction to ornamental Horticulture by J.S. Arora, 1999.
- KalyaniPublishers,Ludhiana,India.PlantpropagationbySandhuM.K.NewAgeInternationalPublishers Ltd. 1989.
- Ornamental plants and Garden design in Tropics and Subtropics (Vol 1 & 2) by T.K. Bose, L.J. Singh, M.K.SandhuandT.KMaity.Publisher:DayaPublishingHouse;AdivisionofAstralInternationalPVt.Ltd.2015.