FACULTY OF LIFE SCIENCES

CURRICULUM AND SCHEME OF EXAMINATIONS: 2020-21

For

B.Sc. (Hons.) Agriculture
(Semester-I, III &V)

(UnderContinuous Evaluation Grading System)

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR (Autonomous)

Kanya Maha Vidyalya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF FOUR YEAR DEGREE PROGRAMME

Bachelor of Science (Honours.) Agriculture (Session- 2020-21)Semester I

Course code	Course Name	Course Type	Marks				Examination time (in hrs)
			Total	Mode of Assessment			
				External		Internal	
				L	P	CA	
BACL-1421 BACL-1031 BACL-1431	Punjabi (Compulsory) Basic Punjabi Punjab History & Culture	C	50	40	-	10	3+3
BACL-1102	Communication Skills in English	C	50	40	-	10	3+3
BACM-1013	Fundamentals of Horticulture	C	50	25	15	10	3+3
BACM-1014	Fundamentals of Plant Pathology	C	100	60	20	20	3+3
BACM-1015	Fundamentals of Soil Sciences	C	75	40	20	15	3+3
BACM-1016	Introduction to Forestry	C	50	25	15	10	3+3
BACM-1017	Fundamentals of Agronomy	C	100	60	20	20	3+3
BACL-1018	Rural Sociology & Educational Psychology	C	50	40	-	10	3
BACM-1059/ BACL-1339	Introductory Biology/ Elementary Mathematics	C	50/ 50	25 40	15 -	10 10	3+3 3
BACL-1010	Agricultural Heritage	C	25	20	-	5	3
SECH-1543	*Human Values & Ethics	AC	25	20	-	5	3
AECD-1161	*Drug Abuse: Problem Management & Prevention (Compulsory)	AC	50	40	-	10	3
SECF-1492	*Foundation Programme	AC	25	25	-	-	3
Total			600				

C-Compulsory
AC-Audit Course
[1]Special paper in lieu of Punjabi (Compulsory).
[2]Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.
*** Marks of these papers will not be added in total marks and only grades will be provided.**

Kanya Maha Vidyalya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF FOUR YEAR DEGREE PROGRAMME
Bachelor of Science (Honours.) Agriculture (Session- 2020-21)Semester III

C-Compulsory

Course code	Course Name	Course Type	Marks				Examination time(in hours)
			Total	Mode of Assessment			
				External		Internal	
				L	P	CA	
BACM-3011	Crop Production Technology-I (*Kharif Crops*)	C	50	25	15	10	3+3
BACM-3012	Fundamentals of Plant Breeding	C	75	40	20	15	3+3
BACM-3013	Introductory Agro-meteorology & Climate Change	C	50	25	15	10	3+3
BACM-3014	Production Technology For Vegetables & Spices	C	50	25	15	10	3+3
BACM-3015	Principles of Seed Technology	C	75	20	40	15	3+3
BACL-3016	Problematic Soils & their Management	C	50	40	0	10	3+0
BACM-3177	Agricultural Finance & Co-operation	C	75	40	20	15	3+3
BACM-3138	Statistical Methods	C	50	25	15	10	3+3
AECE-3229	Environmental Studies and Disaster Management	AC	75	40	20	15	3+3
			550				

AC-Audit Course

Kanya Maha Vidyalya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF FOUR YEAR DEGREE PROGRAMME

Bachelor of Science (Honours.) Agriculture (Session- 2020-21)
Semester V

C-Compulsory
E-Elective

Course code	Course Name	Course Type	Marks				Examination time (in hours)
			Total	Mode of Assessment			
				External		Internal	
				L	P	CA	
BACM-5011	Crop Improvement-I (*Kharif Crops*)	C	50	25	15	10	3+3
BACM-5012	Principles of Integrated Pest and Disease Management	C	75	40	20	15	3+3
BACM-5013	Manures, Fertilizers and Soil Fertility Management	C	75	40	20	15	3+3
BACM-5014	Pests of Crops and Stored Grain and their Management	C	75	40	20	15	3+3
BACM-5015	Diseases of Field and Horticultural Crops and their Management -I	C	75	40	20	15	3+3
BACM-5016	Post-harvest Management and Value Addition of Fruits and Vegetables	C	50	25	15	10	3
BACM-5017	Principles of Organic Farming	C	50	25	15	10	3+3
BACP-5018	Practical Crop Production – I (*Kharif crops*)	C	50	-	40	10	3+3
BACM-5099	Entrepreneurship Development and Business Communication	C	50	25	15	10	3+3
	Elective Courses						
BACM-5010 (OPT-I)	Micro Propagation Technologies	E	75	40	20	15	3+3
BACM-5010 (OPT-II)	Mushroom Cultivation	E	75	40	20	15	3+3
			625				

B.Sc. (Hons.) Agriculture

(Session: 2020-21)

Programme Specific Outcomes (PSO)–

Upon successful completion of this course, students will be able to:

PSO1. acquire, integrate, and apply the plant-science knowledge in a holistic manner

needed for agriculturists.

PSO2. develop interdisciplinary knowledge and have the ability to actually perform

physical tasks that require practice and training .

PSO3. develop creative skills to solve problems and improve current systems and can

intervene to make improvements or correct deficiencies.

PSO4.developed leadership skills and exhibit a high level of professionalism and effective communication.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACL-1421

PUNJABI (COMPULSORY)

BACHELOR OF SCIENCE (HONOURS)AGRICULTURE/ BACHELOR OF SCIENCE (HONOURS)MATHEMATICS/ BACHELOR OF ARTS (HONOURS) ENGLISH/ BACHELOR OF SCIENCE (HONOURS) PHYSICS

SEMESTER–I

COURSE CODE- BOEL/BACL/BOML/BOPL-1421

COURSE OUTCOMES

Co1:'ਸਾਹਿਤ ਦੇ ਰੰਗ' ਪੁਸਤਕ ਦੇ ਕਵਿਤਾ ਭਾਗ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚਲ ਰਹੀਆਂ ਕਾਵਿ ਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਲ ਕਰ ਸਕਣ। ਇਸ ਦਾ ਹੋਰ ਮਨੋਰਥ ਕਵਿਤਾ ਦੀ ਵਿਆਖਿਆ, ਵਿਸ਼ਲੇਸ਼ਣ ਤੇ ਮੁਲੰਕਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ ਵੀ ਹੈ ਤਾਂ ਕਿ ਉਹ ਸਮਕਾਲੀ ਸਮਾਜ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਸਮਝ ਸਕਣ ਅਤੇ ਆਲੋਚਨਾਤਮਕ ਦ੍ਰਿਸ਼ਟੀ ਬਣਾ ਸਕਣ।

Co2:'ਸਾਹਿਤ ਦੇ ਰੰਗ' ਪੁਸਤਕ ਦੇ ਕਹਾਣੀ ਭਾਗ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਹਾਣੀ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਕਹਾਣੀ ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।

Co3:ਪੈਰ੍ਹਾ ਰਚਨਾ ਅਤੇ ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ ਦੇਣ ਦਾ ਮਨਰੋਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

Co4:ਧੁਨੀ ਵਿਉਂਤ ਪੜ੍ਹਣ ਨਾਲ ਵਿਦਿਆਰਥੀ ਧੁਨੀਆਂ ਦੀ ਉਚਾਰਨ ਪ੍ਰਣਾਲੀ ਤੋਂ ਵਾਕਫ਼ ਹੋਣਗੇ।

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACL-1421

PUNJABI (COMPULSORY)

ਸਮਾਂ : 3 ਘੰਟੇ

Maximum Marks: 50
Theory : 40
CA :10

ਪਾਠ ਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I

ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ.ਡਾ ਮਹਿਲ ਸਿੰਘ),ਭਾਗ ਪਹਿਲਾ(ਕਵਿਤਾ),
ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ,ਅੰਮ੍ਰਿਤਸਰ।
(ਸਾਰ,ਵਿਸ਼ਾ ਵਸਤੂ)
(ਡਾ. ਹਰਿਭਜਨ ਸਿੰਘ,ਪਾਸ਼,ਸੁਰਜੀਤ ਪਾਤਰ ਕਵੀ ਪਾਠਕ੍ਰਮ ਦਾ ਹਿੱਸਾ ਨਹੀਂ ਹਨ)8 ਅੰਕ

ਯੂਨਿਟ-II

ਸਾਹਿਤ ਦੇ ਰੰਗ (ਸੰਪਾ.ਡਾ ਮਹਿਲ ਸਿੰਘ),ਭਾਗ ਪਹਿਲਾ(ਕਹਾਣੀ),
ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ,ਅੰਮ੍ਰਿਤਸਰ।
(ਸਾਰ,ਵਿਸ਼ਾ ਵਸਤੂ)
(ਕੋਈ ਇਕ ਸਵਾਰ,ਘੋਟਣਾ, ਆਪਣਾ ਆਪਣਾ ਹਿੱਸਾ ਕਹਾਣੀਆਂ ਪਾਠਕ੍ਰਮ ਦਾ ਹਿੱਸਾ ਨਹੀਂ ਹਨ)8 ਅੰਕ

ਯੂਨਿਟ-III

ਪੈਰ੍ਹਾ ਰਚਨਾ

ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪਸ਼੍ਨਾਂ ਦੇ ਉਤਰ।8 ਅੰਕ

ਯੂਨਿਟ-IV

(ੳ) ਪੰਜਾਬੀ ਧੁਨੀ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ ਤੇਉਚਾਰਨ ਅੰਗ

(ਅ) ਸਵਰ, ਵਿਅੰਜਨ8 ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ। ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।

4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACL-1031

BASIC PUNJABI (ਮੁਢਲੀ ਪੰਜਾਬੀ)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1:ਮੁੱਢਲੀਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਸਿਖਾਉਣ ਦੀ ਪ੍ਰਕਿਰਿਆ ਵਿਚ ਪਾ ਕੇ ਇਕ ਹੋਰ ਭਾਸ਼ਾ ਸਿੱਖਣ ਦੇ ਮੌਕੇ ਪ੍ਰਦਾਨ ਕਰਨਾ ਹੈ।

CO2:ਇਸ ਵਿਚ ਵਿਦਿਆਰਥੀ ਨੂੰ ਬਾਰੀਕਬੀਨੀ ਨਾਲ ਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।

CO3:ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ ਤੋਂ ਜਾਣੂ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।

CO4:ਮੁੱਢਲੀਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਬਾਰੇ ਦੱਸਣਾ ਹੈ।

CO5:ਮੁੱਢਲੀਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦਾ ਸ਼ਬਦ ਘੇਰਾ ਵਿਸ਼ਾਲ ਕਰਨਾ ਹੈ।

CO6:ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਵਿਚਹਫ਼ਤੇ ਦੇ ਸਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕ ਤੋਂ ਸੌ ਤਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ ਸਿਖਾਉਣਾ ਹੈ।

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACL-1031

BASIC PUNJABI

In lieu of Punjabi(Compulsory)

COURSE CODE -BARL/BSML/BSNL/BCSL/BECL/BCRL/BBRL/BJML/BFDL/ BHSL/BCAL/BITL/BBTL/BOEL/BOML/BACL/BCOL/BOPL-1031

ਸਮਾਂ : 3 ਘੰਟੇ **Maximum Marks: 50**

Theory : 40

CA : 10

ਪਾਠ ਕ੍ਰਮ

ਯੂਨਿਟ-I

ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ, ਪੈਰ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ ਅਤੇ ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ ਅਤੇ ਮਾਤ੍ਰਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ) ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ ।

08ਅੰਕ

ਯੂਨਿਟ-II

ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ ਪਛਾਣ (ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ, ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ) **08ਅੰਕ**

ਯੂਨਿਟ-III

ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਆਦਿ ਨਾਲ ਸੰਬੰਧਤ। **08 ਅੰਕ**

ਯੂਨਿਟ-IV

ਹਫ਼ਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ, ਇਕ ਤੋਂ ਸੌ ਤਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ ।

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।

2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।

3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 08 ਅੰਕ ਹਨ।

4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ

ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACL-1431

PUNJAB HISTORY & CULTURE (FROM EARLIEST TIMES TO C 320)

(Special Paper in lieu of Punjabi compulsory)

COURSE OUTCOMES (CO):

After completing Semester I and course on Punjab History and Culture Students of History will be able to identify a complete grasp on the sources & writings of Ancient Indian History of Punjab.

CO1: Identify and describe the emergence of earliest civilizations in: Indus Valley

Civilization and Aryan Societies.

CO2: Identify and analyse the Buddhist, Jain and Hindu faith in the Punjab

CO3: Analyse the emergence of Early Aryans and Later Vedic Period, their Society, Culture,

Polity and Economy.

CO4: To make students understand the concepts of two faiths Jainism and Buddhism, its

principles and their application in present times.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACL-1431

Punjab History & Culture (From Earliest Times to C 320)

(Special Paper in lieu of Punjabi compulsory)

Time: 3 Hours **Max. Marks: 50**

Theory: 40
CA: 10

Instructions for the Paper Setters

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit A

1. Physical features of the Punjab and impact on history.
2. Sources of the ancient history of Punjab

Unit- B

3. Harappan Civilization: Town planning; social, economic and religious life of the India Valley People.
4. The Indo-Aryans: Original home and settlement in Punjab.

Unit- C

5. Social, Religious and Economic life during later *Rig* Vedic Age.
6. Social, Religious and Economic life during later Vedic Age.

Unit- D

7. Teaching and impact of Buddhism
8. Jainism in the Punjab

SUGGESTED READINGS:

1. L. Joshi (ed): *History and Culture of the Punjab*, Art-I, Patiala, 1989 (3rd edition)
2. L.M. Joshi and Fauja Singh (ed); *History of Punjab*, Vol.I, Patiala 1977.
3. Budha Parkash: *Glimpses of Ancient Punjab*, Patiala, 1983.
4. B.N. Sharma: *Life in Northern India*, Delhi. 1966.

B.Sc. (Hons.) Agriculture (Semester –I)
(Session: 2020-21)

Course Code: BACL-1102

COMMUNICATION SKILLS IN ENGLISH
(Theory)
Course Code: BJML/BFDL/BHSL/BCAL/BITL/
BBTL/BACL/BOML/BOPL/BVRL/BVML/BVAL/BVTL/BVNL/BVBL/BVPL-1102

COURSE OUTCOMES

At the end of this course, the students will develop the following Skills:

CO 1: Reading skills that will facilitate them to become an efficient reader

CO 2: The ability torealise not only language productivity but also the pleasure of being able to articulate well

CO 3: The power to analyse, interpret and infer the ideas in the text

CO 4: The ability to have a comprehensive understanding of the ideas in the text and enhance their critical thinking

CO 5: Writing skills of students which will make them proficient enough to express ideas in clear and grammatically correct English

CO 6: Ability to plan, organise and present ideas coherently on a given topic

CO 7: The skill to use an appropriate style and format in writing letters (formal and informal)

B.Sc. (Hons.) Agriculture (Semester –I)
(Session: 2020-21)

Course Code: BACL/ BOPL/BOML/ -1102
COMMUNICATION SKILLS IN ENGLISH
(Theory)
Course Code: BJML/BFDL/BHSL/BCAL/BITL/
BBTL/BACL/BOML/BOPL/BVRL/BVML/BVAL/BVTL/BVNL/BVBL/BVPL-1102

The syllabus is divided in four units as mentioned below:

Unit I

Reading Skills: Reading Tactics and strategies; Reading purposes–kinds of purposes andassociated comprehension; Reading for direct meanings.

Unit II

Reading for understanding concepts, details, coherence, logical progression and meanings of phrases/ expressions.

Activities:

- Comprehension questions in multiple choice format
- Short comprehension questions based on content and development of ideas

Unit III

Writing Skills: Guidelines for effective writing; writing styles for application,personal letter, official/ business letter.

Activities:

- Formatting personal and business letters.
- Organising the details in a sequential order.

Unit IV

Resume, memo, notices etc.; outline and revision.

Activities:

- Converting a biographical note into a sequenced resume or vice-versa
- Ordering and sub-dividing the contents while making notes.
- Writing notices for circulation/ boards

SUGGESTED READINGS:

1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
2.*Business Communication,* by Sinha, K.K. Galgotia Publishers, 2003.
3. *Business Communication* by Sethi, A and Adhikari, B., McGraw Hill Education 2009.
4. *Communication Skills* by Raman, M. & S. Sharma, OUP, New Delhi, India (2011).
5. *English Grammar in Use: A Self Study Reference and Practice Book Intermediate Learners Book* by Raymond Murphy, Cambridge University Press.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1013

FUNDAMENTALS OF HORTICULTURE

(THEORY)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1: understand horticulture, its branches, importance and scope.

CO2: understand botanical classification; climate, soil, irrigation methods and fertilizer application of horticultural plants.

CO3: understand plant propagation-methods and propagating structures.

CO4: understand plant physiological aspects from seed germination to seed formation

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1013

FUNDAMENTALS OF HORTICULTURE

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**

Theory: 25

Practical: 15

C.A:10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit – I

Horticulture - Its definition and branches, importance and scope; horticultural and botanical classification; climate and soil for horticultural crops.

Unit – II

Plant propagation-methods and propagating structures; Seed dormancy, Seed germination, principles of orchard establishment; Principles and methods of training and pruning.

Unit – III

Juvenility and flower bud differentiation; unfruitfulness; pollination, pollinizers and pollinators; fertilization and parthenocarpy.

Unit – IV

Medicinal and aromatic plants; importance of plant bio-regulators in horticulture. Irrigation – methods, Fertilizer application in horticultural crops.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1013

FUNDAMENTALS OF HORTICULTURE

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1: apply concepts of horticulture science to select, manage, and improve plants and their products.

CO2: demonstrate competence with laboratory and/or field-based technologies used in modern horticulture.

CO3: gain skills for nursery and orchard establishment.

CO4:.quantify economic importance of plants in managed ecosystems and the impact of horticultural crops in food system.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1013

FUNDAMENTALS OF HORTICULTURE

(PRACTICAL)

Time: 3Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners.Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, and Jalandhar.

LIST OF EXPERIMENTS

1. Identification of garden tools.
2. Identification of horticultural crops.
3. Preparation of seed bed/nursery bed and sowing of vegetable seeds.
4. Practice of sexual and asexual methods of propagation
5. Exc.4 Continued
6. Micro-propagation.
7. Layout and planting of orchard.
8. Layout of nutrition garden
9. Training and pruning of fruit trees.
10. Preparation of potting mixture.
11. Fertilizer application in different crops.
12. Layout of model nursery
13. Visits to commercial nurseries/orchard.

SUGGESTED READINGS:

1. Chadha, K.L. , Handbook of Horticulture , ICAR, NewDelhi, 2002
2. Dhaliwal M.S., Handbook of vegetable crops, Kalyani Publishers, Ludhiana, 2008.
3. Jitendra Singh, Basic Horticulture, Kalyani Publishers, Ludhiana, 2011.
4. Gopalaswami, I. *Complete Gardening in India* - ICAR New Delhi, 2009.
5. Perter, K.V. (2018). Basic of horticulture. NIPA

Selected Websites:

1. http://aggie-horticulture,tamu.edu/propagation/propagation.html
2. http://www/britannica.com/
3. http://www.horticulture.com.au/export/hmac.asp
4. http://www.horticultureworld.net/hort-india.htm

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1014

FUNDAMENTALS OF PLANT PATHOLOGY

(THEORY)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1: understand different disease causal agents, their characteristics and identification and classification.

CO2: understand how to identify and sustainability manages plant diseases in various production systems.

CO3: understand binomial system of nomenclature, rules of nomenclature, classification of fungi.

CO4: understand epidemiology -factors affecting disease development as well as principles and methods of plant disease management.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1014

FUNDAMENTALS OF PLANT PATHOLOGY

(THEORY)

Time: 3Hrs **Max. Marks: 100**

Theory: 60

Practical: 20

C.A. : 20

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

Introduction: Importance of plant diseases, scope and objectives of Plant Pathology. History of Plant Pathology with special reference to Indian work.Terms and concepts in Plant Pathology and Pathogenesis. Causes / factors affecting disease development: disease triangle and tetrahedron and classification of plant diseases. Important plant pathogenic organisms, differentgroups: fungi, bacteria, fastidious vascular bacteria, phytoplasmas, spiroplasmas, viruses, viroids, algae, protozoa, phanerogamic parasites and nematodes with examples of diseasescaused by them. Diseases and symptoms due to abiotic causes.

Unit-II

Fungi: general characters, definition of fungus, somatic structures, types of fungal thalli, fungal tissues, modifications of thallus, reproduction (asexual and sexual). Nomenclature, Binomial system of nomenclature, rules of nomenclature, classification of fungi. Key to divisions, sub-divisions, orders and classes.Bacteria and mollicutes: general morphological characters. Basic methods of classification and reproduction.Viruses: nature, structure, replicationand transmission. Study of phanerogamic plant parasites.

Unit-III

Growth and reproduction of plant pathogens.Liberation/dispersal and survival of plant pathogens.Types of parasitism and variability in plant pathogens.Pathogenesis.Role of enzymes, toxins and growth regulators in disease development.Defense mechanism in plants.

Unit-IV

Epidemiology: Factors affecting disease development. Principles and methods of plant disease management.Nature, chemical combination, classification, mode of action and formulations of fungicides and antibiotics.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1014

FUNDAMENTALS OF PLANT PATHOLOGY (PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1: understand different laboratory equipments and microscopy.

CO2:understand the principles of host-pathogen interactions and how diseases occur in plants.

CO3: understand the defense mechanisms plants have against plant pathogens and how to manipulate the host-pathogen interaction to reduce and manage diseases.

CO4: differentially diagnose the actual cause or pathogen and suggest management practices.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1014

FUNDAMENTALS OF PLANT PATHOLOGY (PRACTICAL)

Time: 3Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners.Two copies of the same should be submitted for the record to COE Office Kanya Maha Vidyalaya, Jalandhar.

LIST OF EXPERIMENTS

1. Acquaintance with various laboratory equipments and microscopy.
2. Collection and preservation of disease specimen.
3. Preparation of media, isolation and Koch's postulates.
4. General study of different structures of fungi.
5. Study of symptoms of various plant diseases.
6. Study of representative fungal genera.
7. Transmission of plant viruses.
8. Study of phanerogamic plant parasites.
9. Study of fungicides and their formulations.
10. Methods of pesticide application and their safe use.
11. Calculation of fungicide sprays concentrations.

SUGGESTED READINGS:

1. Pandey, B.P. (2001) Plant Pathology, S Chand
2. M.J. Carlile, S.C. Watkinson & G.W. Gooday (2001), The Fungi 2nd Ed., Academic Press.
3. G.N. Agrios (1997), Plant Pathology 4th Ed., Academic Press.
4. R.S. Mehrotra (1980) Plant Pathology Tata McGraw Hill New Delhi

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2019-20)

Course Code: BACM-1014

FUNDAMENTALS OF SOIL SCIENCE

(THEORY)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1: evaluate basic nature of soil, its physical and chemical properties in the context of soil health.

CO2: assess the importance of special variability on soil type.

CO3: determine soil fertility andidentify nutrientdeficiency.

CO4: apply knowledge in reclamation of problematic soil.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1015

FUNDAMENTALS OF SOIL SCIENCE

(THEORY)

Max. Marks: 75

Time: 3 Hrs. **Theory: 40**

Practical: 20

C.A. : 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit – I

Soil as a natural body, Pedological and edaphological concepts of soil; Soil genesis: soil forming rocks and minerals; weathering, processes and factors of soil formation; Soil Profile, components of soil.

Unit – II

Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity; Elementary knowledge of soil taxonomy classification and soils of India; Soil water retention, movement and availability; Soil air, composition, gaseous exchange, problem and plant growth,

Unit – III

Soil temperature; source, amount and flow of heat in soil; effect on plant growth, Soil reaction-pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability; soil colloids inorganic and organic; silicate clays: constitution and properties; sources of charge; ion exchange, cation exchange capacity, base saturation;

Unit – IV

Soil organic matter: composition, properties and its influence on soil properties; humic substances - nature and properties; soil organisms: macro andmicroorganisms, their beneficial and harmful effects; Soil pollution - behaviour of pesticides and inorganic contaminants, prevention and mitigation of soil pollution.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1015

FUNDAMENTALS OF SOIL SCIENCE

(PRACTICALS)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1:understand the basic and applied chemical, physical, andbiological concepts in soil.

CO2: quantify the soil characteristics and identify the nutrient deficiencies.

CO3:evaluate basic soil chemical properties in the context of soil.

CO4: evaluate soil physical parameter important for plant growth.

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B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1015

FUNDAMENTALS OF SOIL SCIENCE

(PRACTICALS)

Time: 3Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners.Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

LIST OF EXPERIMENTS

1. Study of soil profile in field.
2. Study of soil sampling tools, collection of representative soil sample, its processing and storage.
3. Study of soil forming rocks and minerals.
4. Determination of soil density, moisture content and porosity.
5. Determination of soil texture by feel and Bouyoucos Methods.
6. Studies of capillary rise phenomenon of water in soil column and soil.water movement.
7. Determination of soil pH and electrical conductivity.
8. Determination of cation exchange capacity of soil.
9. Study of soil map.
10. Determination of soil colour.
11. Demonstration of heat transfer in soil.
12. Estimation of organic matter content of soil.

SUGGESTED READINGS

1 Brady, N.C. and Weil, R.R., *The Nature and Properties of Soil:* Pearson Edn. Pvt. Ltd. New Delhi, 2002.

2 Oswal, M.C., *Soil Physics*, Oxford & IBH publishing Co.Pvt.Ltd.New Delhi, 1994.

3. Biswas, T.D., and Mukherjee, S.K., *Text book of soil science,* Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1997.

4. Troch, F.R. and Thompson, L.M*Soils and Soil Fertility*, Oxford Press.

Selected Websites:

1. http://newprairiepress.org/ebooks/15/
2. Soils Laboratory Manual, K-State Edition**Authors:** Colby J. Moorberg, David A. Crouse**Publication:** ***NPP eBooks***
3. An Open-Source Laboratory Manual for Introductory, Undergraduate ...
4. https://dl.sciencesocieties.org/publications/nse/pdfs/46/1/170013by CJ Moorberg - 2

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2019-20)

Course Code: BACM-1016

INTRODUCTION TO FORESTRY

(THEORY)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1:describe basic concept of forestry and Indian Forest Policies.

CO2: practice the regeneration of forest species.

CO3: perform measurement of various growth parameters of forest species.

CO4: apply concept of agri-silviculture for ensuring food security.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1016

INTRODUCTION TO FORESTRY

(THEORY)

Max. Marks: 50

Time: 3 Hrs. **Theory: 25**

Practical: 15

C.A. : 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

THEORY:

Unit – I

Introduction – definitions of basic terms related to forestry, objectives of silviculture, forest classification, salient features of Indian Forest Policies.

Unit – II

Forest regeneration, Natural regeneration - natural regeneration from seed and vegetative parts, coppicing, pollarding, root suckers; Artificial regeneration – objectives, choice between natural and artificial regeneration, essential preliminary considerations.

Unit – III

Crown classification.Tending operations – weeding, cleaning, thinning – mechanical, ordinary, crown and advance thinning. Forest mensuration – objectives, diameter measurement, instruments used in diameter measurement; Non instrumental methods of height measurement - shadow and single pole method; Instrumental methods of height measurement - geometric and trigonometric principles, instruments used in height measurement; tree stem form, form factor, form quotient, measurement of volume of felled and standing trees, age determination of trees.

Unit – IV

Agroforestry – definitions, importance, criteria of selection of trees in agroforestry, different agroforestry systems prevalent in the country, shifting cultivation, taungya, alley cropping, wind breaks and shelter belts, home gardens. Cultivation practices of two important fast growing tree species of the region.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1016

INTRODUCTION TO FORESTRY

(PRACTICALS)

COURSE OUTCOMES (CO):

After passing this course the student will be able to

CO1: understand forest mensuration: objectives, diameter measurement, instruments used in diameter measurement.

CO2: understand instrumental methods of height measurement - geometric and trigonometric principles, instruments used in heightmeasurement.

CO3: understand tree stem form, form factor, form quotient, measurement of volume of felled and standing trees, age determination of trees.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1016

INTRODUCTION TO FORESTRY

(PRACTICALS)

Time: 3Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners.Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

LIST OF EXPERIMENTS

1. Identification of tree-species.
2. Diameter measurements using calipers and tape.
3. Tree diameter measurements of forked, buttressed, fluted and leaning trees.
4. Exercise 3 continued
5. Height measurement of standing trees by shadow method, single pole method and hypsometer.
6. Exercise 5 continued
7. Volume measurement of logs using various formulae.
8. Nursery lay out, seed sowing,
9. Exercise 8 continued
10. Vegetative propagation techniques.
11. Forest plantations and their management. Visits of nearby forest based industries.
12. Visits of nearby forest based industries

SUGGESTED READINGS

1. Kothari, A.S., A Celebration of Indian Trees, Marg Pub, New York, 2007.
2. Bore, N.L., A Manual of Indian Forest Botany, International Book Dist.New Delhi, 2008.
3. Diwivedi, A.P., A Text Book of Silviculture, International Book Distributor. New Delhi, 1993.
4. Negi. S.S. Hand Book of Forestry, IBD Publishers, Dehra Dun, 2008

5. Reddy, S.R and Nagamani, C. (2017). Introduction to forestry. Kalyani Publishers, New Delhi.

Selected Websites:

1.www.ITTI.com

2. www.swsc.com

3.www.Candia.co

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1017

FUNDAMENTALS OF AGRONOMY

(THEORY)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1:explain the basic concepts of agronomic practices.

CO2: classify different agronomical crops and explain the tillage implements.

CO3: understand the production of technologies of major crops

CO4: identify the different types of cropping systems and constraints to efficient production of crops.

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B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1017

FUNDAMENTALS OF AGRONOMY

(THEORY)

Time: 3 Hrs. **Max. Marks: 100**

Theory: 60

Practical: 20

C.A. : 20

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit – I

Agronomy and its scope, seeds and sowing, tillage and tilth, crop density and geometry, Crop nutrition, manures and fertilizers, nutrient use efficiency,

Unit – II

Water resources, soil-plant-water relationship, crop water requirement, water use efficiency, irrigation- scheduling criteria and methods, quality of irrigation water, logging.

Unit – III

Weeds- importance, classification, crop weed competition, concepts of weed management principles and methods, herbicides- classification, selectivity and resistance, allelopathy.

Unit – IV

Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, crop management technologies in problematic areas, harvesting and threshing of crops.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1017

FUNDAMENTALS OF AGRONOMY

(PRACTICALS)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1: develop skills to identify the soil moisture levels, seed germination factors

CO2: develop skills to use tillage equipments, herbicide and fertilizer application

CO3: understand weeds their importance, classification, crop weed competition, concepts of weed management, principles and methods.

CO4: herbicides their classification, selectivity and resistance, allelopathy.

.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1017

FUNDAMENTALS OF AGRONOMY

(PRACTICAL)

Time: 3Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners.Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya,Jalandhar.

LIST OF EXPERIMENTS

1. Identification of crops, seeds, fertilizers,
2. Pesticides, herbicidess and implements.
3. Study of yield contributing characters and yield estimation,
4. Seed germination and viability test
5. Use of tillage implements-reversible plough, one way plough, harrow, leveler, seed drill,
6. Identification of weeds in crops.
7. Methods of herbicide and fertilizer application,
8. Study of yield contributing characters and yield estimation.
9. Seed germination and viability test.
10. Numerical exercises on fertilizer requirement, plant population, herbicides andwater requirement.
11. Use of tillage implements- plough, harrow, leveler and seed drill.
12. Study of soil moisture measuring devices and measurement of field capacity.
13. Measurement of soil infiltration rate and irrigation water.

SUGGESTED READINGS

1. Reddy S.R., *Principles of Crop Husbandry,* Kalyani Publishers, Ludhiana, 2009.
2. Handbook of Agriculture, I.C.A.R. Publications, New Delhi, 2008.
3. *Weeds of North India* I.C.A.R. Publications, New Delhi, 2008.
4. *Package of Practices for Rabi and kharif crops,* P.A.U. Publications Ludhiana, corresponding year

Selected Websites:

www.tnau.com

krishikosh.egranth.ac.in

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACL-1018

RURAL SOCIOLOGY & EDUCATIONAL PSYCHOLOGY

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1:comprehend the concept and principles of effective extension.

CO2: identify the organizational set up of agricultural extension.

CO3: become a team leader and be a project management specialist.

CO4: understand the concept of adoption diffusion of motivation, planning and evaluation.

B.Sc. (Hons.) Agriculture (Semester –I)
(Session: 2019-20)

Course Code: BACL-1018

RURAL SOCIOLOGY & EDUCATIONAL PSYCHOLOGY

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**

Theory: 40

C.A:10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit – I

Sociology and Rural sociology: Definition and scope, its significance in agriculture extension, Social Ecology.

Unit – II

Rural society, Social Groups, Social Stratification, Culture concept,

Unit – III

Social Institution, Social Change & Development. Educational psychology: Meaning & its importance in agriculture extension.

Unit – IV

Behavior: Cognitive, affective, psychomotor domain, Personality, Learning, Motivation, Theories of Motivation, Intelligence.

SUGGESTED READINGS

1.Dubey, S.C., Tradition and Development. Vikas Publishing Home Pvt. Ltd. Jangpura, New Delhi.,2008
2.Gupta, D., Social Stratification. Oxford University Press, Delhi, 2004.

Selected Websites:

1. http://www.agriinfo.in/default.aspx?page=topic&superid=7&topicid=516

2. http://www.yourarticlelibrary.com/sociology/rural-leadership-meaning-and-characteristics-of-rural-leadership/34944/
3. www.hillagric.ac.in/edu/coa/AgriEcoExtEduRSocio/lectures/Ext121.pd

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACM-1059

INTRODUCTORY BIOLOGY

(THEORY)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1:understand the living world, diversity and characteristics of life, origin of life, evolution and eugenics.

CO2: understand binomial nomenclature and classification cell and cell division.

CO3: understand morphology of flowing plants. Seed and seed germination.

CO4: understand plant systematic Brassicaceae, Fabaceae and Poaceae.

CO5: understand role of animals in agriculture.

B.Sc. (Hons.) Agriculture (Semester – I)
(Session 2019-20)
INTRODUCTORY BIOLOGY

Course Code: BACM-1059

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the living world, diversity and characteristics of life, origin of life, evolution and eugenics.

CO2: Understand binomial nomenclature and classification cell and cell division.

CO3: Understand morphology of flowing plants. Seed and seed germination.

CO4: Understand plant systematic Brassicaceae, Fabaceae and Poaceae.

CO5: Understand role of animals in agriculture.

B.Sc. (Hons.) Agriculture (Semester – I)
(Session: 2020-21)
INTRODUCTORY BIOLOGY

Course Code: BACM-1059

Time: 3 Hrs. **Max. Marks: 50**

Theory: 25
Practical: 15
C.A:10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit – I

Introduction to the living world, diversity and characteristics of life, origin of life, Evolution and Eugenics.

Unit – II

Binomial nomenclature and classification Cell and cell division.

Unit – III

Morphology of flowing plants.Seed and seed germination.

Unit – IV

Plant systematic- viz; Brassicaceae, Fabaceae and Poaceae.Role of animals in agriculture. Report of the ICAR Fifth Deans' Committee

B.Sc. (Hons.) Agriculture (Semester – I)
(Session: 2020-21)
INTRODUCTORY BIOLOGY

Course Code: BACM-1059

Time: 3 Hrs. **Marks: 15**

Instructions for the Practical Examiners: Question paper is to set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar

PRACTICAL

1. Morphology of flowering plants – root, stem and leaf and their modifications.
2. Inflorescence, flower and fruits.
3. Cell, tissues & cell division.
4. Internal structure of root, stem and leaf. Study of specimens and slides. Description of plants - Brassicaceae, Fabaceae and Poaceae.

SUGGESTED READINGS

1.Dutta, C., Text book of Botany, Oxford University Press- India, 2000.
2.Bhatia K.N. and Widge, R., Introduction of Botany, Truman Publishers, Jalandhar, 2010.
3.Vidyarthi, S., Text book of Botany, S. Chand and Company, New Delhi, 2002.
4.Frederick V.T., A Text book of Agricultural Zoology, General Books Publications, London, 2010.

B.Sc. (Hons.) Agriculture (Semester –I)
(Session: 2020-21)

Course Code: BACL-1339

Course Title: ELEMENTARY MATHEMATICS

COURSE OUTCOMES (CO):

After the successful Completion of this program the students will be able to:

CO1: Understand the concept of Distance formulae, equation of coordinate axes, equation of lines parallel to axes, slope and intercept form of equation of line and manage to find angles between the straight lines.

CO2: Explain general equation of a circle and demonstrate equation of a circle passing through three given points.

CO3: Understand the basis of matrices and algebra of matrices and apply determinants and its properties to find inverse of matrix up to 3^{rd} order.

CO4: Recognize algebraic, exponential, logarithmic function and will come to know how to calculate their differentiation and apply derivatives of sum, difference, product and quotient of two functions.

B.Sc. (Hons.) Agriculture (Semester–I)
(Session: 2020-21)
ELEMENTARY MATHEMATICS
Course Code: BACL-1339

Time: 3 Hours **Max. Marks: 50**
Theory: 40
CA:10

Instructions for the Paper Setters:
Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Straight lines : Distance formula, section formula (internal and external division), Equation of co-ordinate axes, Equation of lines parallel to axes, Slope-intercept form of equation of line, Slope-point form of equation of line, Two point form of equation of line,
Intercept form of equation of line, Normal form of equation of line, General form of equation of line, Point of intersection of two straight lines, Angles between two straight lines, Parallel lines, Perpendicular lines.

UNIT-II

Circle: Equation of circle whose centre and radius is known, General equation of a circle, Equation of circle passing through three given points, Equation of circle whose diameters is line joining two points (x_1, y_1) & (x_2,y_2).

UNIT-III

Differential Calculus: Definition of function, limit and continuity of algebraic functions. Differentiation of algebraic functions, exponential functions and logarithmic differentiation (excluding trigonometric functions). Derivative of sum, difference, product and quotient of two functions. Integral Calculus: Integration of Product of two functions, Integration by substitution method, Definite Integrals of algebraic functions.

UNIT-IV

Matrix: Definition of Matrices, Addition, Subtraction, Multiplication, Transpose of matrix up to 3^{rd} order.Determinants: Properties of determinants and their evaluation, Inverse of matrix up to 3^{rd} order. Matrix method.

SUGGESTED READINGS:

1. Hussain I. et. al. Mathematics, A textbook for class XI, NCERT.

2.Joshi, D.D. et. al. Mathematics, A textbook for class XII, NCERT.
3. Mathematical Hand Book: M. Vygodsky, Mir, Mascow, 1975.
4. Differential Calculus: Shanti Narayan, New Delhi, Shyam Lal, 1983.
5. Integral Calculus: Shanti Narayan, Delhi, S. Chand, 1968.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: BACL-1010

AGRICULTURAL HERITAGE

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1: understand the traditional Indian agriculture.

CO2: distinguish between past and current agriculture conditions.

CO3: differentiate between traditional and modern agricultural technologies.

CO4: elaborate the scope and future prospects of agricultural sciences.

B.Sc. (Hons.) Agriculture (Semester –I)
(Session: 2020-21)

Course Code: BACL-1010

AGRICULTURAL HERITAGE

Time: 3 Hrs. **Max. Marks: 25**
Theory: 20
C.A.:5

Instructions for the Paper Setter
Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit – I

Introduction of Indian agricultural heritage; Ancient agricultural practices, Relevance of heritage to present day agriculture;

Unit – II

Past and present status of agriculture and farmers in society; Journey of Indian agriculture and its development from past to modern era;

Unit – III

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;

Unit – IV

Crop significance and classifications; National agriculture setup in India; Current scenario of Indian agriculture; Indian agricultural concerns and future prospects.

SUGGESTED READINGS

1. Nene,Y.L.,Choudhary ,S.L. Agricultural Heritage in India.(2004)
2. Saxena,R.C.,Choudhary S.L. and Nene Y.L. A Textbook on Ancient History of Indian Agriculture. (2009).
3. Kumari, D. and Veerpal M. Agricultural Heritage in India AGROTECH, India. (2012)
4. Choudhary,S.L. ,Asean Agri.History Foundation India (AHFI),(2004)

Selected Websites:

1. eagri.tnau.ac.in/eagri50/AGRO102/lec11.pdf ,
2. http://www.kiran.nic.in/Agri-Heritage.html
3. https://en.wikipedia.org/wiki/Traditional_knowledg

B.Sc. (Hons.) Agriculture (Semester –I)
(Session: 2020-21)

Course Code: SECH-1543

HUMAN VALUES AND ETHICS

(THEORY)

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1: understand universal human aspirations happiness and prosperity, human values and ethics.

CO2: understand fundamental values, ethics, ICT, sensitization towards others - senior citizens, developmentally challenged and gender.

CO3: understand spirituality, positive attitude and scientific temper, team work and volunteering.

CO4: understand rights andresponsibilities, human relations, family harmony, drug abuse problem and other social evils.

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B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: SECH-1543

HUMAN VALUES AND ETHICS

(THEORY)

Time: 3 Hours **Max. Marks: 25**

Theory: 20
C.A.:5

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Universal human aspirations: Happiness and prosperity; Human values and ethics: Concept,definition, significance and sources.

UNIT-II

Fundamental values: Right conduct, peace, truth, love andnon-violence; Ethics: professional, environmental, ICT; Sensitization towards others particularlysenior citizens, developmentally challenged and gender.

UNIT-III

Spirituality, positive attitude and scientific temper; Team work and volunteering; Rights andresponsibilities; Road safety; Human relations and family harmony; Modern challenges and value conflict.

UNIT-IV

Sensitization against drug abuse and other social evils; Developing personal code ofconduct (SWOT Analysis); Management of anger and stress.

SUGGESTED READINGS:

1. Dr. Rajan Mishra, Human Values. Laxmi Publications Pvt. Ltd.
2. S. Dinesh Babu, Professional Ethics and Human Values. Laxmi Publications Pvt. Ltd.
3. P.S. Rathore, Business Ethics and Communication. S. Chand Publishing.
4. Dr. K. Alex. Manegerial Skills. S. Chand Publishing.
5. Dr. M. Adithan. Study skills for professional students for higher education. S. Chand Publishing.
6. R. R. Gaur and R. Sangal. A foundation course in Human Values and Professional Ethics.

Selected Websites:

- www.tatamcgrawhill.com/digital Solutions/monopoly
- www.schandedutech.com
- www.laxmipublications.com

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: AECD-1161

DRUG ABUSE: PROBLEM MANAGEMENT AND PREVENTION

COURSE OUTCOMES (CO):

After passing this course the student will be able to:

CO1. This information can include factual data about what substance abuse is; warning signs of addiction; information about how alcohol and specific drugs affect the mind and body;

CO2. How to be supportive during the detoxification and rehabilitation process.

CO3. Main focus of substance abuse education is teaching individuals about drug and alcohol abuse and how to avoid, stop, or get help for substance use disorders.

CO4. Substance abuse education is important for students alike; there are many misconceptions about commonly used legal and illegal substances, such as alcohol and marijuana.

B.Sc. (Hons.) Agriculture (Semester –I)

(Session: 2020-21)

Course Code: AECD-1161

DRUG ABUSE: PROBLEM MANAGEMENT AND PREVENTION

Time: 3 Hrs **Max.Marks: 50**

Theory: 40

CA: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

1)Meaning of Drug Abuse: Concept and Overview, Historical Perspective of Drug Abuse, Drug Dependence, Drug Addiction, Physical and Psychological Dependence: Drug Tolerance and withdrawal symptoms.

Unit II

2) Types of Abused Drugs and their Effects -I

1) Stimulants: Amphetamines – Benzedrine, Dexedrine, Cocaine.
2) Depressants: Alcohol Barbiturates: Nembutal, Seconal, Phenobarbital and Rohypnol.
3) Narcotics: Heroin, Morphine, Oxycodone.

Unit III

3) Types of abused drugs and their effects - II

1) Hallucinogens: Cannabis, Marijuana, Hashish, Hash Oil, MDMA, LSD.
2) Steroids.

Unit IV

4) Nature and Extent of the Problem: Magnitude or prevalence of the menace of Drug Abuse in India and Punjab, Vulnerable groups by age, gender and economic status, Signs and Symptoms of Drug Abuse: Physical, Academic, Behavioural and Psychological Indicators.

References:

1.Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3.Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
6. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
7. Sain, Bhim 1991, *Drug Addiction Alcoholism*, Smoking obscenity New Delhi: Mittal

Publications.
8. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.
9. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3011

CROP PRODUCTION TECHNOLOGY-I (*KHARIF CROPS*)

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Learn about basic principles of crop production practices of *kharif* crops.

CO2: Understand about cultural operations for raising *kharif* crops.

CO3: Precisely understand about qualitative and quantitative input requirements for *Kharif* crop production.

CO4: Learn about various management practices for commercial crop production.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3011

CROP PRODUCTION TECHNOLOGY-I (*KHARIF CROPS*)

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**

Theory: 25

Practical: 15

C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

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.

Unit – II

Cultural practices and yield of kharif crops – pulses – pigeonpea, mungbean and urdbean.

Unit – III

Cultural practices and yield of kharif crops – oilseeds – groundnut and soybean; fibre crops – cotton & jute.

Unit – IV

Cultural practices and yield of kharif crops – forage crops – sorghum, cowpea, cluster bean and napier bajra.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3011

CROP PRODUCTION TECHNOLOGY-I (*KHARIF CROPS*)

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Raise nursery of rice crop and do transplanting.

CO2: Learnabout sowing, nutrient requirements of various *kharif* crops.

CO3: Realize the effect of seed size and sowing depth on germination of seeds and develop the idea of yield contributing factors and its calculation. .

CO4: Identify various problematic weeds of *kharif* crops and their management.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3011

CROP PRODUCTION TECHNOLOGY-I (*KHARIF CROPS*)

(PRACTICALS)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1 Rice nursery preparation.
2 Transplanting of rice.
3 Sowing of soybean, pigeonpea & mungbean. Maize, groundnut & cotton.
4 Effect of seed size on germination and seedling vigour of kharif season crops.
5 Effect of sowing depth on germination of kharif crops.
6 Identification of weeds in kharif season crops.
7 Top dressing & foliar feeding of nutrients.
8 Study of yield contributing characters and yield calculation of kharif season.
9 Study of crop varieties and important agronomic experiments at experimental farm.
10 Study of forage experiments, morphological description of kharif season crop.
11 Visit to research centres of related crops.

SUGGESTED READINGS

1. Anonymous (2018) Package of practices for cultivation of Kharif Crops, Punjab Agricultural University, Ludhiana.
2. Indian Council of Agricultural Research (2017). Handbook of Agriculture, ICAR, New Delhi.
3. Jeyaraman S (2018). Field crops production and management Vol. 1. CBS.
4. Panda S.C. (2018). Agronomy of fodder & forage crop, Kalyani Publishers, New Delhi.
5. Reddy, S.R. Agronomy of Field Crops, Kalyani Publishers, Ludhiana.
6. Reddy S R (2016). Introduction to agronomy and principles of crop production. Kalyani Publishers, New Delhi.
7. Singh S S and Singh R (2018). Crop management. Kalyani Publishers, New Delhi.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3012

FUNDAMENTALS OF PLANT BREEDING

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Understand about the genetic basis and methods of breeding of self-pollinated & cross pollinated crops.

CO2: Understand the concept of polyploidy, mutation, DNA markers and marker assisted selection in plant breeding.

CO3: Learn the application of plant breeding techniques for crop improvement.

CO4: Learn about IPR, patenting, Plant Breeders & Farmer's Rights.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3012

FUNDAMENTALS OF PLANT BREEDING

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**

Theory: 40

Practical: 20

C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Historical development, concept, nature and role of plant breeding, major achievements and future prospects; Genetics in relation to plant breeding, modes of reproduction and apomixis, self – incompatibility and male sterility- genetic consequences, cultivar options. Domestication, Acclimatization, introduction; Centres of origin/diversity, components of Genetic variation; Heritability and genetic advance.

Unit – II

Genetic basis and breeding methods in self- pollinated crops; mass and pure line selection, hybridization techniques and handling of segregating population; Multiline concept. Concepts of population genetics and Hardy-Weinberg Law, Genetic basis and methods of breeding cross pollinated crops, modes of selection.

Unit – III

Heterosis and inbreeding depression, development of inbred lines and hybrids, composite and synthetic varieties; Breeding methods in asexually propagated crops, clonal selection and hybridization; Wide hybridization and pre-breeding.

Unit – IV

Polyploidy in relation to plant breeding, mutation breeding methods and uses; Biotechnological tools-DNA markers and marker assisted selection. Participatory plantbreeding; Intellectual Property Rights, Patenting, Plant Breeders and Farmer’s Rights.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3012

FUNDAMENTALS OF PLANT BREEDING

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Understand floral morphology of self and cross pollinated crops and germplasm variations.

CO2: Learn emasculation & hybridization techniques in self & cross pollinated crops

CO3: Study different breeding methods for crop improvement and procedures for evaluating performance of crops

CO4: Utilize statistical methods, various designs used in plant breeding.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3012

FUNDAMENTALS OF PLANT BREEDING

(PRACTICALS)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1 Plant Breeder's kit.
2 Study of germplasm of various crops.
3 Study of floral structure of self-pollinated and cross pollinated crops.
4 Emasculation and hybridization techniques in self & cross pollinated crops. Consequences of inbreeding on genetic structure of resulting populations.
5 Study of male sterility system. Handling of segregation populations.
6 Methods of calculating mean, range, variance, standard deviation, heritability.
7 Designs used in plant breeding experiment, analysis of Randomized Block Design.
8 To work out the mode of pollination in a given crop and extent of natural out crossing. Prediction of performance of double cross hybrids.

SUGGESTED READINGS

1. Allard, Robert W (2018). Principles of plant breeding. John Wiley & Sons.
2. Singh B.D. (2017). Plant breeding: principles and methods. Kalyani Publishers, New Delhi.
3. Phundan Singh (2018). Essentials of plant breeding. Kalyani Publishers, New Delhi.
4. Phundan Singh (2017). Plant Breeding: Molecular and new approaches. Kalyani Publishers, New Delhi.
5. Bahl P. N, Salimath P. M (1997). Genetics, cytogenetics and breeding of crop plant Vol. II. Oxford & IBH.
6. Ram, Hari Har (2016). Crop breeding and biotechnology. Kalyani Publishers, New Delhi.
7. Sharma A.K and Sharma Ramavt (2014). Crop improvement and mutation breeding. Scientific Publishers.

B.Sc. (Hons.) Agriculture (Semester-III)

(Session: 2020-21)

Course Code: BACM-3013

INTRODUCTORY AGROMETEOROLOGY & CLIMATE CHANGE

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Have understanding about earth's atmosphere, climate and weather parameters.

CO2: Learn about precipitation, monsoon status of India and concept of artificial rainmaking.

CO3: Learn about the significance of weather and weather hazards in crop production.

CO4: Understand the process of weather forecasting, climate change and its widespread impact on agriculture.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3013

INTRODUCTORY AGROMETEOROLOGY & CLIMATE CHANGE

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**
Theory: 25
Practical: 15
C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Meaning and scope of agricultural meteorology, Earth atmosphere- its composition, extent and structure, Atmospheric weather variables, Atmospheric pressure- its variation with height, Wind, types of wind, daily and seasonal variation of wind speed, cyclone, anticyclone, land breeze and sea breeze.

Unit – II

Nature and properties of solar radiation, solar constant, depletion of solar radiation, short wave, longwave and thermal radiation, net radiation, albedo, Atmospheric temperature, temperature inversion, lapse rate, daily and seasonal variations of temperature, vertical profile of temperature, Energy balance of earth; Atmospheric humidity, concept of saturation, vapor pressure, process of condensation, formation of dew, fog, mist, frost, cloud.

Unit – III

Precipitation, process of precipitation, types of precipitation such as rain, snow, sleet, and hail, cloud formation and classification, Artificial rainmaking. Monsoon- mechanism and importance in Indian agriculture, Weather hazards - drought, floods, frost, tropical cyclones and extreme weather conditions such as heat-wave and cold-wave.

Unit – IV

Agriculture and weather relations; Modifications of crop microclimate, climatic normals for crop and livestock production. Weather forecasting- types of weather forecast and their uses. Climate change, climatic variability, global warming, causes of climate change and its impact on regional and national Agriculture.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3013

INTRODUCTORY AGROMETEOROLOGY & CLIMATE CHANGE

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: develop understanding about various meteorological instruments and their working.

CO2: Acquire skills in measuring radiation, air and soil temperature, atmospheric pressure, wind speed and direction.

CO3: Learn about determination of vapor pressure and relative humidity, dew point temperature.

CO4: understand about evapotranspiration, soil water balance and rainfall variation and heat units and measuring precipitation

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3013

INTRODUCTORY AGROMETEOROLOGY & CLIMATE CHANGE

(PRACTICALS)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. Visit of Agrometeorological Observatory, site selection of observatory, exposure of instruments and weather data recording.
2. Measurement of total, shortwave and longwave radiation, and its estimation using Planck's intensity law.
3. Measurement of albedo and sunshine duration, computation of Radiation Intensity using BSS.
4. Measurement of maximum and minimum air temperatures, its tabulation, trend and variation analysis.
5. Measurement of soil temperature and computation of soil heat flux.
6. Determination of vapor pressure and relative humidity.
7. Determination of dew point temperature.
8. Measurement of atmospheric pressure and analysis of atmospheric conditions.
9. Measurement of wind speed and wind direction, preparation of wind rose.
10. Measurement, tabulation and analysis of rain.
11. Measurement of open pan evaporation and evapotranspiration.
12. Computation of PET and AET.

SUGGESTED READINGS:

1. Lenka D (2015). Climate, weather and crops in India. Kalyani Publishers, New Delhi.
2. Mavi, H.S. (2016). Introduction to agrometerology. Oxford & IBH Publishing.
3. Gouindan K (2016). Agricultural meteorology and dry farming. Kalyani Publishers, New Delhi.
4. Mahi G.S. and Kingra P.K. (2016). Fundamentals of Agrometeorology. Kalyani Publishers, New Delhi.
5. Sahu, D.D, Chopra, M.C and Kac. (2015). Practical agrometeorology. Agrobios

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3014

PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Understand importance of vegetables & spices in human nutrition and national economy.

CO2: Learn about origin, area, production, cultural practices and seed production of important vegetable groups.

CO3: Learn about origin, area, production, cultural practices and seed production of important spices.

CO4: Learn about harvesting technique and post-harvest handling and economics of commercial vegetable and spice cultivation.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3014

PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**

Theory: 25

Practical: 15

C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

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 and seed production of tomato, brinjal, chilli, capsicum.

Unit – II

Origin, area, climate, soil, improved varieties and cultivation practices and seed production of root crops viz. carrot, radish, beetroot etc, bulb crops viz. onion, garlic etc and cole crops viz. cabbage, cauliflower, knol-khol etc.

Unit – III

Origin, area, production, improved varieties and cultivation practices and seed production of cucurbitaceous crops viz. cucumber, melons, gourds, pumpkin etc, leafy crops viz. amaranth, palak, perennial vegetables etc and leguminous crops viz. peas, french bean and tuber crops viz. potato, sweet potato, colocasia etc.

Unit – IV

Origin, area, production, improved varieties and cultivation practices and seed production of important spices.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3014

PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Identify various vegetable crops & their seeds.

CO2: Learn about nursery raising & transplanting techniques.

CO3: Plan and lay out vegetable garden and production practices

CO4: Learn about harvesting technique and post-harvest handling and economics of commercial vegetable and spice cultivation.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3014

PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES

(PRACTICALS)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1 Identification of vegetables & spice crops and their seeds.
2 Nursery raising of vegetable crops.
3 Direct seed sowing and transplanting.
4 Study of morphological characters of different vegetables & spices.
5 Fertilizers applications.
6 Offseason production of nursery
7 Vegetables & spices seed extraction.
8 Harvesting & preparation for market.
9 Economics of vegetables and spices cultivation.

SUGGESTED READINGS

1 Anonymous (2018). Package of practices for cultivation of vegetable crops. Punjab Agricultural University, Ludhiana.
2 Dhaliwal, Major Singh (2017). Handbook of vegetable crops. Kalyani Publishers, New Delhi.
3 Gopalakrishnan, T.R. (2007). Vegetable crops. New India Publishing Agency.
4 Hazra P and Som M. G. (2016). Vegetable seed production and hybrid technology. Kalyani Publishers, New Delhi.
5 Prasad S and Bhardwaj Raju L. (2016). Production technology of spices, aromatic, medicinal and plantation crops. Agrobios (India), Jodhpur.
6 Rana, M.K. (2015). Technology for Vegetable Production. Kalyani Publishers, New Delhi.
7 Thamburaj, S and Narendra Singh (2016). Vegetables, tuber crops and spices. ICAR, New Delhi.

B.Sc. (Hons.) Agriculture (Semester-III)

(Session: 2020-21)

Course Code: BACM-3015

PRINCIPLES OF SEED TECHNOLOGY

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Learn about maintenance of genetic purity and quality seed production.

CO2: Have sound knowledge of different breeding tools used in seed production

CO3: Learn about different seed testing methods, the process of seed certification and seed act.

CO5: Learn about seed processing, packing, storage, pest control and marketing.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3015

PRINCIPLES OF SEED TECHNOLOGY

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**

Theory: 20

Practical: 40

C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Seed and seed technology: introduction, definition and importance. Deterioration causes of crop varieties and their control; Maintenance of genetic purity during seed production. Seed quality- Definition, Characters of good quality seed, different classes of seed.

Unit – II

Foundation and certified seed production of important cereals, pulses, oilseeds, fodder and vegetables. Seed certification, phases of certification, procedure for seed certification, field inspection. Seed Act and Seed Act enforcement. Duty and powers of seed inspector, offences and penalties. Seeds Control Order 1983. Varietal Identification through Grow Out Test and Electrophoresis, Molecular and Biochemical test.

Unit – III

Detection of genetically modified crops, Transgene contamination in non-GM crops, GM crops and organic seed production.Seed drying, processing and their steps, seed testing for quality assessment, seed treatment, its importance, method of application and seed packing. Seed storage; general principles, stages and factors affecting seed longevity during storage.

Unit – IV

Measures for pest and disease control during storage. Seed marketing: structure and organization, sales, generation activities, promotional media. Factors affecting seed marketing, Role of WTO and OECD in seed marketing. Private and public sectors and their production and marketing strategies.

B.Sc. (Hons.) Agriculture (Semester-III)

(Session: 2020-21)

Course Code: BACM-3015

PRINCIPLES OF SEED TECHNOLOGY

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Learn seed production in major cereals, pulses, oilseeds and vegetable crops.

CO2: Experience seed sampling and testing technique.

CO3: Acquire information about seed certification process.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3015

PRINCIPLES OF SEED TECHNOLOGY

(PRACTICALS)

Time: 3 Hrs **Marks: 40**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1 Seed production in major cereals: Wheat, Rice, Maize, Sorghum, Bajra and Ragi.
2 Seed production in major pulses: Urd, Mung, Pigeonpea, Lentil, Gram, Field bean, pea.
3 Seed production in major oilseeds: Soybean, Sunflower, Rapeseed, Groundnut and Mustard.
4 Seed production in important vegetable crops.
5 Seed sampling and testing: Physical purity, germination, viability, etc.
6 Seed and seedling vigour test.
7 Genetic purity test: Grow out test.
8 Seed certification: Procedure, Field inspection, Preparation of field inspection report.
9 Trizolium chloride test for seed viability.
10 Modification of storage environment for temperature and relative humidity.

SUGGESTED READINGS

1. Agarwal, R.L.1995. Seed Technology. Oxford and IBH Publication Co., New Delhi.
2. Dhrendra Khare and Mohan S. Bhale. 2007. Seed Technology. Scientific Publishers (India), Joghpur.
3. Phundan Singh (2016). Objective seed technology. Kalyani Publishers, New Delhi.
4. Phundan Singh (2017). Principles of seed technology. Kalyani Publishers, New Delhi.

B.Sc. (Hons.) Agriculture (Semester-III)

(Session: 2020-21)

Course Code: BACL-3016

PROBLEMATIC SOILS AND THEIR MANAGEMENT

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Learn about the soil quality, health, wasteland and problematic soils in India.

CO2: Learnabout reclamation procedures of problematic soils and bioremediation.

CO3: Have knowledge about quality & standards of irrigation water and utilization of saline water in Agriculture.

CO4: Understand the importance of Remote Sensing & GIS in diagnosing and managing problem soils.

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B.Sc. (Hons.) Agriculture (Semester-III)

(Session: 2020-21)

Course Code: BACL-3016

PROBLEMATIC SOILS AND THEIR MANAGEMENT

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**

Theory: 40

C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Soil quality and health, Distribution of Waste land and problem soils in India. Their categorization based on properties.

Unit – II

Reclamation and management of Saline and sodic soils, Acid soils, Acid Sulphate soils, Eroded and Compacted soils, Flooded soils, Polluted soils.

Unit – III

Irrigation water – quality and standards, utilization of saline water in agriculture. Remote sensing and GIS in diagnosis and management of problem soils.

Unit – IV

Multipurpose tree species, bio remediation through MPTs of soils, land capability and classification, land suitability classification. Problematic soils under different Agro-ecosystems.

SUGGESTED READINGS

1. Indian Society of Soil Science (2012). Fundamentals of Soil Science. IARI, New Delhi.
2. Das, D.K. (2015). Introductory Soil Science, 4th edition, Kalyani Publishers, New Delhi.
3. Bhattacharya, Lata (2018). Textbook of soil chemistry. Discovery.
4. Saha, Arun Kumar (2014). Methods of physical and chemical analysis of soil. Kalyani Publishers, New Delhi.
5. Brady Nyle C and Weil Ray R. (2017). Nature and properties of soils. Pearson Publications.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3177

AGRICULTURAL FINANCE AND CO-OPERATION

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Understand the concept of Agricultural Finance& Agricultural credit.

CO2: Have knowledge about various sources of agricultural finance and micro-financing.

CO3: Learn about various finance institutions like NABARD, RBI, ADB, IMF, World Bank etc

CO4: Describe the concept of Agricultural Co-operation in India.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3177

AGRICULTURAL FINANCE AND CO-OPERATION

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**

Theory: 40

Practical: 20

C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

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.

Unit – II

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.

Unit – III

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.

Unit – IV

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.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3177

AGRICULTURAL FINANCE AND CO-OPERATION

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Analyse the progress and performance of co-operatives from published data.

CO2: Acquire knowledge about management, schemes and procedures of commercial banks, co-operative banks and societies.

CO3: Estimate the credit requirement of farm business, analyze balance sheet and income statement.

CO4: Understand techno-economic parameters for preparation of projects and appraisal procedures of loan proposal.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3177

AGRICULTURAL FINANCE AND CO-OPERATION

(PRACTICALS)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. Determination of most profitable level of capital use.
2. Optimum allocation of limited amount of capital among different enterprise.
3. Analysis of progress and performance of cooperatives using published data.
4. Analysis of progress and performance of commercial banks and RRBs using published data.
5. Estimation of credit requirement of farm business – A case study.
6. Preparation and analysis of balance sheet – A case study.
7. Preparation and analysis of income statement – A case study.
8. Appraisal of a loan proposal – A case study.
9. Visit to a commercial bank, cooperative bank and cooperative society to acquire firsthand knowledge of their management, schemes and procedures.

SUGGESTED READINGS:

1. Subba Reddy, S. and P. Raghuram, P., Sastry, T.V.N. and Bhavani Devi, I. (2016). Agricultural Economics. Oxford &IBH Publishing Company Private Ltd. New Delhi.
2. Mukhi, H.R. (1983). Cooperation in India and Abroad. New Heights Publishers, New Delhi.
3. Muniraj,R. (1987). Farm Finance for Development. Oxford &IBH Publishing Company Ltd., New Delhi.
4. John, J. Hamptron. (1983). Financial decision making: Concepts, Problems and Cases of India. New Delhi John,

B.Sc. (Hons.) Agriculture (Semester-III)

(Session: 2020-21)

Course Code: BACM-3138

STATISTICAL METHODS

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Get introduced with Statistics and its application in Agriculture.

CO2: Learn about graphical representation of data, measures of central tendancy & dispersion, correlation & regression.

CO3: Get familiarize with test of significance, chi-square test, ANOVA test etc.

CO4: Know about various sampling methods.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3138

STATISTICAL METHODS

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**
Theory: 25
Practical: 15
C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Introduction to Statistics and its Applications in Agriculture, Graphical Representation of Data, Measures of Central Tendency & Dispersion.

Unit – II

Definition of Correlation, Scatter Diagram. Karl Pearson's Coefficient of Correlation. Linear Regression Equations. Introduction to Test of Significance, One sample & two sample test t for Means

Unit – III

Chi-Square Test of Independence of Attributes in 2 X 2 contingency table. Introduction to Analysis of Variance, Analysis of One Way Classification.

Unit – IV

Introduction to Sampling Methods, Sampling versus Complete Enumeration, Simple Random Sampling with and without replacement.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3138

STATISTICAL METHODS

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Learn about graphical representation of data.

CO2: Practice measures of central tendancy and dispersion of various forms of data.

CO3: Get introduced with moments, correlation & regression analysis.

CO4: Acquaint with the knowledge of one-sample and two-sample t-test, chi-square test.

CO5: Learn about One way ANOVA.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: BACM-3138

STATISTICAL METHODS

(PRACTICALS)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1 Graphical Representation of Data.
2 Measures of Central Tendency (Ungrouped data) with Calculation of Quartiles, Deciles & Percentiles.
3 Measures of Central Tendency (Grouped data) with Calculation of Quartiles, Deciles & Percentiles.
4 Measures of Dispersion (Ungrouped Data).
5 Measures of Dispersion (Grouped Data).
6 Moments, Correlation & Regression Analysis.
7 Application of One Sample t-test and Two Sample Fisher's t-test.
8 Chi-Square test of Goodness of Fit and Chi-Square test of Independence of Attributes for 2 X 2 contingency table.
9 Analysis of Variance One Way Classification. Analysis of one way.
10 Analysis of variance in two-way (Factorial analysis).

SUGGESTED READINGS

1 Chandel SRS. Hand Book of Agricultural Statistics. Achal Prakashan Mandir Publications, New Delhi.
2 Dhamu K.P. & Ramamoorthy K. (2009). Fundamentals of Agricultural Statistics. Scientific Publishers.
3 Nageswara Rao, G (2007). Statistics for Agricultural Sciences. B.S Publications, Hyderabad.
4 Rangaswamy R (1995). A Text Book of Agricultural Statistics. New Age International (P) Ltd., Publishers, Hyderabad.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: AECE-3229

ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Understand about value of natural resources like forest, water, minerals, energy, land and associated problems

CO2: Basic ecological principles, ecosystem and its functions

CO3: Learn about conservation of biodiversity, environmental pollution in relation with human population and other social issues.

CO4: Learn all about natural as well as man made disasters and their management practices.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: AECE-3229

ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**
Theory: 40
Practical: 20
C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Multidisciplinary nature of environmental studies Definition, scope and importance. Natural Resources: Renewable and non-renewable resources, Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources. Case studies. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit – II

Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem. Ecological succession, Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) 106 107 Report of the ICAR Fifth Deans' Committee Report of the ICAR Fifth Deans' Committee Biodiversity and its conservation: - Introduction, definition, genetic, species & ecosystem diversity and biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels, India as a mega-diversity nation. Hot-sports of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit – III

Environmental Pollution: definition, cause, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards. Solid Waste Management: causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management. Environmental ethics: Issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. dies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human Population and the Environment: population growth, variation among nations, population explosion, Family Welfare Programme. Environment and human health: Human Rights, Value Education, HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health.

Unit – IV

Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves, Climatic change: global warming, Sea level rise, ozone depletion. Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, air pollution, water pollution, deforestation, industrial waste water pollution, road accidents, rail accidents, air accidents, sea accidents. Disaster Management- Effect to migrate natural disaster at national and global levels. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community –based organizations and media. Central, state, district and local administration; Armed forces in disaster response; Disaster response; Police and other organizations.

B.Sc. (Hons.) Agriculture (Semester-III)

(Session: 2020-21)

Course Code: AECE-3229

ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Understand pollution problems through case studies and field work.

CO2: Acquire skills in documentation of various environmental assets.

CO3: Learn about biodiversity in relation to different habitats and study different ecosystem.

CO4: Learn about dealing in emergency about with natural calamities.

B.Sc. (Hons.) Agriculture (Semester-III)
(Session: 2020-21)

Course Code: AECE-3229

ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

(PRACTICALS)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1 Visit to the Agricultural field and study the components of agroecosystem.
2 Visit to the Pond/River ecosystem to study biotic and abiotic components.
3 Study the bioindicators of agro/pond/river ecosystem.
4 Visit to Botanical Garden or undisturbed forest.
5 Pollution case studies and pollution indicator plants/insects or birds.
6 Visit to the sewage treatment plants.
7 Estimation of chlorides in the effluent treatment.
8 Collection, processing and storage of industrial effluent samples.
9 Case Studies- Field work: Visit to a local area to document environmental assets river/ forest/ grassland/ hill/ mountain
10 Visit to a local polluted site-Urban/Rural/Industrial/ Agricultural.

SUGGESTED READINGS

1 Benny Joseph (2017). Environmental studies simplified. Tata McGraw Hill.
2 Cunningham W (2016). Principles of Environmental Science; Inquiry and application. McGraw Hill.
3 Moo-young M. (2007). Environmental biotechnology: principles and application. Springer.
4 Nagar Ranita (2010). Disaster Management. APH Publishing Corporation.
5 Narayan B. (2000). Disaster Management. APH Publishing Corporation.
6 Wong M.H. (2013). Environmental Contamination: Health risks & ecological restoration. CRC Press.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5011

CROP IMPROVEMENT-I (*KHARIF CROPS*)

(THEORY)

COURSE OUTCOMES (CO):

After the course students will be able to:

CO1: recognize the biodiversity in *kharif*crops and understand the floral morphology.

CO2: identify characteristics of self- and cross-pollinated plants.

CO3: master various techniques in varietal development in *kharif* crops.

CO4: maintain the germplasm for the improvements in varieties.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5011

CROP IMPROVEMENT-I (*KHARIF CROPS*)

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**

Theory: 25

Practical: 15

C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Centers of origin, distribution of species, wild relatives in different cereals; pulses; oilseeds; fibres; fodders and cash crops; vegetable and horticultural crops.

Unit – II

Plant genetic resources, its utilization and conservation, study of genetics of qualitative and quantitative characters; Important concepts of breeding self-pollinated, cross pollinated and vegetatively propagated crops

Unit – III

Major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional).

Unit – IV

Hybrid seed production technology in Maize, Rice, Sorghum, Pearl millet and Pigeonpea, etc. Ideotype concept and climate resilient crop varieties for future.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5011

CROP IMPROVEMENT-I (*KHARIF CROPS*)

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Understanding floral biology of major commercial crops & various hybridization techniques.

CO2: identify characteristics of self- and cross-pollinated plants.

CO3: master various techniques in varietal development in *kharif* crops.

CO4: maintain the germplasm for the improvements in varieties.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5011

CROP IMPROVEMENT-I (*KHARIF CROPS*)

(PRACTICAL)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1**.** Floral morphology of kharif cereals crop (rice, maize, sorghum and pearl millet).
2**.** Floral biology in kharif pulse and oilseed crops (pigeon pea, mung bean, cowpea and groundnut).
3.Emasculation and hybridization in cereals - rice and maizesorghum and bajra
4. Emasculation and hybridization in major pulses and oilseed crops. (pigeonpea, urd bean, mung bean and cowpea)
5.Floral morphology in cotton and vegetables crop species (brinjal, okra and cucurbitaceous crops).
6.Emasculation and hybridization in vegetables crop species(brinjal, okra and cucurbitaceous crops)
7.Handling of germplasm and segregating populations by different methods like pedigree,bulk and single seed decent .
8.Estimation of heterosis, inbreeding depression and heritability.
9. Study of field techniques for seed production and hybrid seeds production in *Kharif* crops
10. Study of donor parents for quality characters
11.To visit to seed production plots of different field crops

SUGGESTED READINGS

1. Chahal G S and Gosal S S 2002. Principles and procedure of plant breeding: biotechnological and conventional approaches. CRC Press, Florida.
2. Chopra, V L 2000. *Breeding of field crops (*edt.). Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Manjit S. Kang 2004. *Crop improvement: challenges in the twenty-first century* (edt). International Book Distributing Co., Lucknow.
4. Sharma, A K 2005. *Breeding technology of crop plants* (edt.). Yash Publishing house, Bikaner.
5. Ram. H H. 2005. *Vegetable breeding — principles and practices.* Kalyani publishers, New Delhi.

Selected websites:

https://www.agrimoon.com/breeding-of-field-horticultural-crops-icar-ecourse-pdf-book/
http://www.battaly.com/science/flowerlab_no.htm
http://www.agriquest.info/hybrid_seed.php
http://en.citizendium.org/wiki/Crop_origins_and_evolution
http://www.encyclopedia.com/sc/107249-agriculture-and-horticulture.htm

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5012

PRINCIPLES OF INTEGRATED PEST AND DISEASE MANAGEMENT

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: develop an expertise in identification ofcrop pests, disease causing organisms and lossescaused by them.

CO2: analyze varied measures for management of pest and diseases in *kharifcrops*.

CO3: develop aplan for ecologically sound pest management tactics.

CO4: justify the short and longer benefits of blended management approach for pests and diseases productivity.

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B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5012

PRINCIPLES OF INTEGRATED PEST AND DISEASE MANAGEMENT

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**
Theory: 40
Practical: 20
C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Categories of insect pests and diseases, IPM: Introduction, history, importance, concepts, principles and tools of IPM. Economic importance of insect pests, diseases and pest risk analysis.Methods of detection and diagnosis of insect pest and diseases.

Unit – II

Calculation and dynamics of economic injury level and importance of Economic threshold level. Methods of control: Host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control.

Unit – III

Introduction to conventional pesticides for the insect pests and disease management. Survey surveillance and forecasting of Insect pest and diseases. Development and validation of IPM module.

Unit – IV

Implementation and impact of IPM (IPM module for Insect pest and disease. Safety issues in pesticide uses. Political, social and legal implication of IPM. Case histories of important IPM programmes. Case histories of important IPM programmes.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5012

PRINCIPLES OF INTEGRATED PEST AND DISEASE MANAGEMENT

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: identify major insect pests and diseases of different crops.

CO2: estimate plant diseases and yield losses of crops.

CO3: develop strategies and tactics of IPM, pest monitoring and decision making.

CO4:compare the benefits of pest and diseases management with IPM.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5012

PRINCIPLES OF INTEGRATED PEST AND DISEASE MANAGEMENT

(PRACTICAL)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. To identify insect pests of different crops
2. To identify plant diseases of different crops
3. To study koch's postulates for the confirmation of plant pathogens
4. To study pest surveillance and forecasting of insect pests and plant diseases.
5. Crop monitoring and assessment of crop yield losses.
6. Identification of biocontrol agents, different predators and natural enemies.
7. Mass multiplication of *Trichoderma*, *Pseudomonas*, *Trichogramma*, NPV etc.
8. Identification and nature of damage of important insect pests and diseases and their management.
9. Population dynamics of a selected insect pest and diseases.
10. IPM and decision making.
11. Awareness campaign at farmers fields.

SUGGESTED READINGS

1. Rangaswamy, G and Mahadevan, A. 2001. Diseases of crop plants in India. Prentice Hall of India Pvt Ltd., New Delhi.

2. Dhaliwal G S, Ram Singh & Jindal Vikas 2013. A textbook of integrated pest management.Kalyani Publ, Ludhiana.

3. Dhaliwal G S & Arora Ramesh 2004.Principles of insect pest management by. KalyaniPubl, Ludhiana.

4. Agrios G N 2005. *Plant pathology*. 5th ed. Academic Press, New York. (Indian ed.)

5. Mehrotra, R S and AggarwalA. 2007. Plant pathology. Tata Mcgraw Hill Publishing Co. Ltd., New Delhi

Selected websites:

http://vikaspedia.in/agriculture/crop-production/integrated-pest-managment/ipm-for-cerels/ipmstrategies-for-wheat/wheat-pests

http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_insectpest%20_cereals_paddymain.html

http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_insect_agri_pest.html

http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_insect_horti_pest_spices_plant.html

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5013

MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: identify soil types and ways to improve soil fertility.

CO2: interpret soil analytical data with a view to assess fertilizer requirements.

CO3: chalk out strategies for using this information to guide farmers for soil management.

CO4: work out the details for integrated soil nutrient management optimizing organic, inorganic and biological components.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5013

MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**
Theory: 40
Practical: 20
C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Introduction and importance of organic manures, properties and methods of preparation of bulky and concentrated manures. Green/leaf manuring. Fertilizer recommendation approaches. Integrated nutrient management.

Unit – II

Chemical fertilizers: classification, composition and properties of major nitrogenous, phosphatic, potassic fertilizers, secondary & micronutrient fertilizers, Complex fertilizers, nano fertilizers Soil amendments, Fertilizer Storage, Fertilizer Control Order. History of soil fertility and plant nutrition. criteria of essentiality.

Unit – III

Role, deficiency and toxicity symptoms of essential plant nutrients, Mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants. Chemistry of soil nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and micronutrients.

Unit – IV

Soil fertility evaluation, Soil testing. Critical levels of different nutrients in soil. Forms of nutrients in soil, plant analysis, rapid plant tissue tests. Indicator plants. Methods of fertilizer recommendations to crops. Factor influencing nutrient use efficiency (NUE), methods of application under rainfed and irrigated conditions.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5013

MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: interpret soil analytical data with a view to predicting fertilizer requirements.

CO2:demonstrate advanced knowledge of the soil-plant system to improve plant growth and yield.

CO3: interpret soil analytical data with a view to predicting fertilizer requirements.

CO4: work out the details for integrated soil nutrient management optimizing organic, inorganic and biological components.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5013

MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT

(PRACTICAL)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. Introduction of analytical instruments and their principles.
2. Colorimetry and flame photometry.
3. Determination of soil organic carbon.
4. Estimation of alkaline hydrolysable N in soils.
5. Estimation of soil extractable P in soils.
6. Estimation of exchangeable K, Ca and Mg in soils
7. Estimation of soil extractable S in soils.
8. Estimation of DTPA extractable Zn in soils.
9. Estimation ofN in plants.
10. Estimation of P in plants.
11. Determination ofK in plants.

SUGGESTED READINGS

1. Rajesh Singh and Singh S S 2014. Soil fertility and nutrient management. Kalyani Publ, Ludhiana.
2. Brady N C & Weil R R 2017. The nature and properties of soils. Pearson Education, India.
3. BiswasT D& MukherjeeS K 2006.Text book of soil science. Tata Mcgraw Hill Publishing Co. Ltd, New Delhi.
4. Rai M M 2002.Principal of soil science. Mac Millan India Ltd, New Delhi.
5. ISSS 2002. Fundamental of soil science. Div. of Soil Science, IARI, New Delhi.

Selected websites:

1. http://agritech.tnau.ac.in/agriculture/agri_nutrientmgt_integrntrientmgt.html
2. agritech.tnau.ac.in/org farm/orgfarm_manure.html
3. http://www.agriinfo.in/default.aspx?page=topic&superid=1&topicid=360
4. https://www.jove.com/.../soil-nutrient-analysis-nitrogen-phosphorus-and-potassium Chemistry of major nutrients
5. http://krishi.bih.nic.in/Acts-Rules/Fert_Order_1985.pdf

B.Sc. (Hons.) Agriculture (Semester-V)

(Session: 2020-21)

PESTS OF CROPS AND STORED GRAIN AND THEIR MANAGEMENT

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: identify the insect pests on various crops and stored grains

CO2: be judgmental in deciding about proper time of pest management based on bionomics and their nature of damage.

CO3: select appropriate safe pesticide and calculate doses and techniques for pesticides applications.

CO4: devise the pest management techniques in storage of grain and food products.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5014

PESTS OF CROPS AND STORED GRAIN AND THEIR MANAGEMENT

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**
Theory: 40
Practical: 20
C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

General account on nature and type of damage by different arthropods pests. Scientific name, order, family, host range, distribution, biology and bionomics, nature of damage, and management of major pests.

Unit – II

Scientific name, order, family, host range, distribution, nature of damage and control practice other important arthropod pests of various field crop, vegetable crop, fruit crop, plantation crops, ornamental crops, spices and condiments.

Unit – III

Factors affecting losses of stored grain and role of physical, biological, mechanical and chemical factors in deterioration of grain.

Unit – IV

Insect pests, mites, rodents, birds and microorganisms associated with stored grain and their management. Storage structure and methods of grain storage and fundamental principles of grain store management.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5014

PESTS OF CROPS AND STORED GRAIN AND THEIR MANAGEMENT

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: identify the insect pests on various crops and stored grains.

CO2: select appropriate safe pesticide and calculate doses and techniques for pesticides applications.

CO3: devise pest management strategies for agricultural and horticultural crops.

CO4: devise the pest management techniques in storage of grain and food products.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5014

PESTS OF CROPS AND STORED GRAIN AND THEIR MANAGEMENT

(PRACTICAL)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1 Identification of types of damage caused by insect pests.
2 Identification of insect pests of rice and sorghum and their management.
3 Identification of insect pests of f wheat and maize and their management
4 To study the pests of sugarcane and cotton and their management
5 To study the pests of pulses and oil seeds crops and theirManagement
6 Estimation of crop losses caused by pests
7 Calculations on the doses of insecticides application technique.
8 Identification of pests of vegetable crops and their management
9 Identification of pests of fruit crops and their management
10 Fumigation of grain store / godown.
11 Identification of rodents and rodent control operations in godowns.
12 Visit to nearest FCI godowns.

SUGGESTED READINGS

1. AtwalA S. and Dhaliwal, G S 2002. Agricultural pests of South Asia and their management.Kalyani Publishers, Ludhiana.
2. SrivastavaK P 2004. A text book of applied entomology vol 1 & 2. Kalyani Publishers, Ludhiana.
3. Sehgal P K &Mir M A2014. A text book of agricultural entomology.Kalyani Publishers, Ludhiana.
4. Dhaliwal G S&Ramesh A 2014. Integrated pest management.Kalyani Publishers, Ludhiana.
5. Awasthi V B 2017. Agricultural insect pests and their control 2nd ed. Scientific Publishers, Jodhpur.

Selected websites:

http://gardeningsolutions.ifas.ufl.edu/care/pests-and-diseases/pests/management/different-pestsdifferent-damage.html
http://vikaspedia.in/agriculture/crop-production/integrated-pest-managment/ipm-for-cerels/ipmstrategies-for-wheat/wheat-pestshttp://agritech.tnau.ac.in/crop_protection/crop_prot_crop_insectpest%20_cereals_paddymain.html
http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_insect_agri_pest.html
http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_insect_horti_pest_spices_plant.html

B.Sc. (Hons.) Agriculture (Semester-V)

(Session: 2020-21)

Course Code: BACM-5015

DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT –I

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: acquire scientific knowledge about diseases and disorders of field & fruit crops.

CO2: apply knowledge to identify and solve problems based on disease symptoms produced during different stages of field & fruit crops plant development.

CO3: gain awareness about disease cycle of various pathogens associated with field & fruit crop disease.

CO4: extend their knowledge over disease associated with tropical and temperate fruit crops.

B.Sc. (Hons.) Agriculture (Semester-V)

(Session: 2020-21)

Course Code: BACM-5015

DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT –I

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**

Theory: 40

Practical: 20

C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Symptoms, etiology, disease cycle and management of major diseases of following crops: Field Crops: Rice: blast, brown spot, bacterial blight, sheath blight, false smut, khaira and tungro;Maize: stalk rots, downy mildew, leaf spots; Sorghum: smuts, grain mold and anthracnose, Bajra:downy mildew and ergot; Groundnut: early and late leaf spots, wilt.

Unit – II

Soybean: Rhizoctonia blight, bacterial spot, seed and seedling rot and mosaic; Pigeonpea: Phytophthora blight, wilt and sterility mosaic; Finger millet: Blast and leaf spot; black & green gram. Cercospora leaf spot and anthracnose, web blight and yellow mosaic; Castor: Phytophthora blight;Tobacco: black shank, black root rot and mosaic.

Unit – III

Horticultural Crops: Guava: wilt and anthracnose; Banana: Panama wilt, bacterial wilt, Sigatoka and bunchy top;Papaya: foot rot, leaf curl and mosaic, Pomegranate: bacterial blight; Coconut: wilt and bud rot; Tea: blister blight; Coffee: rust.

Unit – IV

Cruciferous vegetables: Alternaria leaf spot and black rot. Brinjal: Phomopsis blight and fruit rot and Sclerotinia blight; Tomato: damping off, wilt, early and late blight, buck eye rot and leaf curl and mosaic; Okra: Yellow Vein Mosaic; Beans: anthracnose and bacterial blight; Ginger: soft rot; Colocasia: Phytophthora blight.

B.Sc. (Hons.) Agriculture (Semester-V)

(Session: 2020-21)

Course Code: BACM-5015

DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT –I

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: acquire scientific knowledge about diseases and disorders of field & fruit crops.

CO2: apply knowledge to identify and solve problems based on disease symptoms produced during different stages of field & fruit crops plant development.

CO3: gain awareness about disease cycle of various pathogens associated with field & fruit crop disease.

CO4: Gain familiarity with regard to field- and lab-based approaches for the diagnosis of diseases and pathogens in field & fruit crops.

(Session: 2020-21)

Course Code: BACM-5015

DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT –I

(PRACTICAL)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. Collection and preservation of plant diseased specimens for Herbarium
2. **Symptoms, etiology, disease cycle and management of diseases of :** Rice
3. ---------- do ---------- Maize
4. ---------- do ---------- Pearl & finger millet
5. ---------- do ---------- Soybean, Groundnut and Castor
6. ---------- do ---------- Black gram and Green gram
7. ---------- do ---------- Papaya and Guava
8. ---------- do ---------- Banana and Mango
9. ---------- do ---------- Tomato, Okra and Brinjal
10. ---------- do ---------- of Cruciferous Crops
11. ---------- do ---------- Ginger and Bean crops
12. To visit Field for diagnosis of plant diseases

SUGGESTED READINGS

1. Singh, R S 2006. Diseases of fruit crops. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.
2. Singh R S 2007. Plant diseases (8th ed). Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.
3. Gupta V K &PaulY S 2008. Diseases of field crops (2nded.). Kalyani publishing co. ND.
4. Mehrotra R S&Aggarwal A 2012. Plant pathology (12thed.).Tata Mcgraw Hill Publishing Co Ltd. ND.
5. Rangaswamy G&MahadevanA 2012. Diseases of crop plants in India (4th ed.). Prentice Hall of India Pvt Ltd, New Delhi.

Selected websites:

https://www.agro.basf.co.za/agroportal/za/media/basf_ap_training_presentations/BASF_Cereal_Disease_Encyclopedia.pdf
http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_diseases.html Diseases ofcereal crops
http://ecourses.iasri.res.in/e-Leaarningdownload3_new.aspx?Degree_Id=01
http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_diseases_agri.html
http://www.croppro.com.au/crop_disease_manual/ch01s01.php

B.Sc. (Hons.) Agriculture (Semester-V)

(Session: 2020-21)

Course Code: BACM-5016

POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: understand the causes of postharvest loss and changes in fruits and vegetables.

CO2: describe different storage techniques for horticultural produce.

CO3: discuss principle and methods of processing or value addition.

CO4: prepare value added product from fruit and vegetable.

B.Sc. (Hons.) Agriculture (Semester-V)

(Session: 2020-21)

Course Code: BACM-5016

POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES

(THEORY)

Time: 3 Hrs.

Max. Marks: 50
Theory: 25
Practical: 15
C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Importance of post-harvest processing of fruits and vegetables, extent and possible causes of post harvest losses; Pre-harvest factors affecting postharvest quality, maturity, ripening and changes occurring during ripening

Unit – II

Respiration and factors affecting respiration rate; Harvesting and field handling; Storage (ZECC, cold storage, CA, MA, and hypobaric); Value addition concept

Unit – III

Principles and methods of preservation; Intermediate moisture food- Jam, jelly, marmalade, preserve, candy – Concepts and Standards; Fermented and non-fermented beverages.

Unit – IV

Tomato products- Concepts and Standards; Drying/ Dehydration of fruits and vegetables – Concept and methods, osmotic drying. Canning -– Concepts and Standards, packaging of products.

B.Sc. (Hons.) Agriculture (Semester-V)

(Session: 2020-21)

Course Code: BACM-5016

POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: understand the causes of postharvest loss and changes in fruits and vegetables.

CO2: describe different storage techniques for horticultural produce.

CO3: discuss principle and methods of processing or value addition.

CO4: prepare value added product from fruit and vegetable.

B.Sc. (Hons.) Agriculture (Semester-V)

(Session: 2020-21)

Course Code: BACM-5016

POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES

(PRACTICAL)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. Identification of important tools/equipments/ machines and chemicals required for PHT laboratory
2. Applications of different types of packaging, containers for shelf life extension.
3. Effect of temperature on shelf life and quality of produce(drying and dehydration).
4. Demonstration of chilling and freezing injury in vegetables and fruits.
5. Extraction and preservation of pulps and juices.
6. Preparation of jam, jelly, RTS, nectar, squash,
7. tomato products, pickles and canned products.
8. Osmotically dried products,
9. Fruit bar and Candy
10. Quality evaluation of products -- physico-chemical and sensory.
11. Visit to processing unit/ industry.

SUGGESTED READINGS

1. Pantastiko E B 1975. Post-harvest Physiology, Handling and Utilization of Tropical and Sub-tropical Fruits and Vegetables, Westport (Connecticut).
2. Pandey P H 2007. Principles and Practices of Post-harvest Technology. Kalyani Publ, N. Delhi.
3. Sharma S K and Nautiyal M C 2009. Post-harvest technology of Horticultural Crops. New India Publishing Agency, Pitampura, New Delhi.
4. Bhutan R C 2012. Fruits and Vegetable Preservation. Biotech Book, N. Delhi.
5. Srilaxmi B 2016. Food Science. New Age International Publ., N. Delhi.

Selected Websites

http://agritech.tnau.ac.in/postharvest/pht_intro.htmlS

http://eagri.org/eagri50/HORT381/pdf/lec01.pdf

http://www.fao.org/docrep/005/y4358e/y4358e05.htm Post-harvest handling considerations for fresh fruits and vegetables

https://extension.umn.edu/preserving-and-preparing/making-jams-marmalades-preserves-and-conserves

https://content.ces.ncsu.edu/packaging-requirements-for-fresh-fruits-and-vegetables Packaging of fruit and vegetable.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5017

PRINCIPLES OF ORGANIC FARMING

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Learn about basic principles of organic farming.

CO2: optimize the soil nutrients utilizing organic and biological means for raising kharif*crops*.

CO3: Precisely understand about qualitative and quantitative input requirements for *Kharifcrop* production and ecologically sound.

CO4: Learn about various management practices for commercial crop production with more dependence on organic inputs.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5017

PRINCIPLES OF ORGANIC FARMING

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**

Theory: 25
Practical: 15
C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Organic farming, principles and its scope in India; Initiatives taken by Government (central/ state), NGOs and other organizations for promotion of organic agriculture.

Unit – II

Organic ecosystem and their concepts; Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming

Unit – III

Choice of crops and varieties in organic farming; Fundamentals of insect, pest, disease and weed management under organic mode of production; Operational structure of NPOP

Unit – IV

Certification process and standards of organic farming; Processing, leveling, economic considerations and viability, marketing and export potential of organic products.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5017

PRINCIPLES OF ORGANIC FARMING

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: identify the key components of organic farming.

CO2: optimize the soil nutrients utilizing organic and biological means for raising *kharifcrops*.

CO3: Precisely understand about qualitative and quantitative input requirements for*kharifcrop* production and ecologically sound.

CO4:analyze the information about the Operational structure of NPOP.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5017

PRINCIPLES OF ORGANIC FARMING

(PRACTICAL)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. Visit of organic farms to study the various components and their utilization.
2. Preparation of enrich compost, vermicompost, bio-fertilizers/bio-inoculants and their quality analysis.
3. Indigenous technology knowledge (ITK) for nutrient, insect, pest disease and weed management.
4. Cost of organic production system.
5. Post-harvest management.
6. Quality aspect, grading, packaging and handling.

SUGGESTED READINGS

1. Rai N & Yadav D S 2005. 'Approaches for Organic Farming'. *Advances in Vegetable Production*.Research Book Centre, N. Delhi.

2. Joshi Mukand & Parbhakarashetty 2005. Sustainability through Organic Farming. Kalyani Publ, Ludhiana.

3. Trivedi P C 2011. Organic Farming for Sustainable Agriculture. Aavishkar Publ. Jaipur.

4. Singh S S & Singh Rajesh 2007. Sustainable Agriculture for Secured Survival. Kalyani Publ, Ludhiana.

5. Veeresh G K 2006. Organic Farming. Cambridge University Press India Pvt. Ltd, N. Delhi.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACP-5018

PRACTICAL CROP PRODUCTION – I (*KHARIF CROPS*)

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: describe intercultural operations of different *kharif crops*.

CO2: grasp bout cultural operations for raising *kharif crops*.

CO3: demonstrate plant protection measures of different crops.

CO4: calculate economics of different crops for commercial crop production.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACP-5018

PRACTICAL CROP PRODUCTION – I (*KHARIF CROPS*)

(PRACTICAL)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1 Crop planning.
2 Raising field crops in multiple cropping systems.
3 Field preparation, application of manures and fertilizers
4 Selection of crop and varieties, seed treatment and sowing of crops
5 Observation of germination
6 Thinning and gap filling
7 Intercultural operations-hoeing and weeding
8 Water management- application of irrigation water and demonstrating methods of irrigation
9 Top dressing of fertilizer (urea) and insect-pest and disease management technologies
10 Harvesting, threshing, winnowing and storage
11 Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.

SUGGESTED READINGS

1. Das N R 2007. Introduction to crops of India. Scientific Publishers, Jodhpur.
2.Yawalkar K S AggarwalJ P& BokdeS 2008. Manures and fertilizers (10th ed.).Agri-horticultural Publishing House, Nagpur.
3. Balasubramaniyam P& Palaniappan, S P 2016. Principles and practices of Agronomy. Agrobios, Jodhpur.
4. Reddy S R 2016. Principles of Agronomy (5th ed.). Kalyani Publishers, Ludhiana.
5. Singh S S& Singh Rajesh2015. Principles and practices of Agronomy (5th re-set). Kalyani Publishers, Ludhiana.

Selected Websites:

http://www.icar.org.in/en/node/9072
agricoop.nic.in/programmesandschemes/integrated-nutrient-management Integrated nutrient management
http://www.eolss.net/sample-chapters/c10/E5-15-02-04.pdf
http://www.fao.org/docrep/006/Y4360E/y4360e0a.htm Field preparation.
http://ppqs.gov.in/PDF/Seed%20Treatment%20Rabi123.htm

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5099

ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS COMMUNICATION

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: understand entrepreneurship and business start-up planning.

CO2:prepare a concept to identify the business skills, potential team members, partners, customers and investors.

CO3:develop a sound knowledge about legal and ethical business.

CO4:analyze basic skills to start their enterprises communicate effectively both orally and in business writings as well deliver effective presentations.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5099

ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS COMMUNICATION

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**
Theory: 25
Practical: 15
C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Concept of Entrepreneur, Entrepreneurship Development, Characteristics of entrepreneurs; SWOT Analysis & achievement motivation, Government policy and programs and institutions for entrepreneurship development

Unit – II

Impact of economic reforms on Agribusiness/ Agri-enterprises, Entrepreneurial Development Process; Business Leadership Skills; Developing organizational skill (controlling, supervising, problem solving, monitoring & evaluation).

Unit – III

Developing Managerial skills, Business Leadership Skills (Communication, direction and motivation Skills), Problem solving skill.

Unit – IV

Supply chain management and Total quality management, Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agri-entrepreneurship and rural enterprise.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5099

ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS COMMUNICATION

(PRACTICAL)

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B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5099

ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS COMMUNICATION

(PRACTICAL)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1– 2 Assessing entrepreneurial traits, problem solving skills, managerial skills and achievement motivation.
3- -4 Exercise in creativity, time audit through planning, monitoring and supervision.
5- -6 Identification and selection of business idea.
7- -9 Preparation of business plan and proposal writing.
10 -11 Visit to entrepreneurship development institute and entrepreneurs.

SUGGESTED READINGS

1. Harold Koontz & Heinz Weihrich 2004. Essentials of management: an international perspective,(2nd ed.) Tata Mc-graw Hill Publishing Pvt Ltd., New Delhi.
2. Mohanty S K 2007. Fundamentals of entrepreneurship. Prentice Hall India Ltd., New Delhi.
3. Poornima Charantimath 2006. Entrepreneurship development: small business enterprise.Pearson Education, New York.
4 Jayashree,K, Anil Kumar, Mini K. Abhraham &Poornima S C 2015. Entrepreneurship development.New Age International, New Delhi.
5. Nandan H 2011. Fundamentals of entrepreneurship. Phi Learning Pvt Ltd, India.

Selected websites:

http://ecoursesonline.iasri.res.in/mod/page/view.php?id=49544
https://shodhganga.inflibnet.ac.in/bitstream/10603/103242/11/11_chapter%204.pdf
https://www.geospatialworld.net/article/impact-of-economic-reforms-on-indian-agricultural-sector-application-ofgeomatics
https://www.indiatrust.org/docs/22%20INTRODUCTION%20LESSION%20AS%20ENTREPRENEURSHIP.pdf
https://en.wikipedia.org/wiki/Total_quality_management

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5010

MICRO PROPAGATION TECHNOLOGIES

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: Learn about basic principles of crop production practices of *kharifcrops*.

CO2: Understand about cultural operations for raising *kharifcrops*.

CO3: Precisely understand about qualitative and quantitative input requirements for *kharifcrop* production.

CO4: Learn about various management practices for commercial crop production.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5010

MICRO PROPAGATION TECHNOLOGIES

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**
Theory: 40
Practical: 20
C.A: 15

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Introduction, History, Advantages and limitations; Types ofcultures (seed, embryo, organ, callus, cell)

Unit – II

Stages of micropropagation, Axillary bud proliferation (Shoot tip and meristemculture, bud culture)

Unit – III

Organogenesis (callus and direct organ formation), Somatic embryogenesis,cell suspension cultures

Unit – IV

Production of secondary metabolites, Somaclonal variation,Cryopreservation

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5010

MICRO PROPAGATION TECHNOLOGIES

(PRACTICAL)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1: demonstrate the knowledge of the tissue culture maintenance techniques.

CO2: use lab equipment and develop expertise in culture media preparation sterilization and raising callus from organ explants.

CO3: successfully maintain cultures with good viability, minimal contamination and appropriate documentation.

CO4: recognize and troubleshoot problems common to routine cell culture.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5010

MICRO PROPAGATION TECHNOLOGIES

(PRACTICAL)

Time: 3 Hrs **Marks: 20**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. Identification and use of equipments in tissue culture Laboratory.
2. Composition. and preparation of Nutrition media
3. Sterilization techniques for media, containers and small instruments.
4. Sterilization techniques for explants.
5. Preparation of stocks and working solution.
6. Preparation of selective medium.
7. Culturingof explants: Seeds, shoot tip and single node.
8. Callus induction.
9. Induction of somatic embryosregeneration of whole plants from different explants.
10. Hardening procedures.

SUGGESTED READINGS

1. Chawala H S 2000. Introduction to Plant Biotechnology. Oxford & IBH, New Delhi

2. Gupta, P. K. 2008. Elements of Biotechnology. Rastogi Publications, Meerut

3. Shekhawat M. S. 2011.Plant Biotechnology: In vitro Principles, Techniques and Applications. MJP Publishers, Chennai

4. Mascarenhas A. F. 2008. Hand Book of Plant Tissue Culture. ICAR,New Delhi

5. Singh B D 2005. Biotechnology, Expanding Horizons.Kalyani Publishers, Ludhiana.

Selected Websites

http://agritech.tnau.ac.in/bio-tech/biotech_tc_notes.html

https://en.wikipedia.org/wiki/Micropropagation
https://www.researchgate.net/publication/236028153_Advanced_technology_in_micropropagation_of_some_important_plants
https://www-pub.iaea.org/MTCD/publications/PDF/te_1384_web.pdf
https://www.isaaa.org/resources/publications/pocketk/14/default.asp

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5010

MUSHROOM CULTIVATION

(THEORY)

COURSE OUTCOMES (CO):

After passing this course student will be able to:

CO1:will gain necessary competencies for isolating and culturing the different species of edible fungus.

CO2: develop mushroom spawn under lab conditions as pure culture.

CO3:become skillful for mushroom cultivation under natural environmental conditions.

CO4: identify the various pest and disease conditions in mushroom houses.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5010

MUSHROOM CULTIVATION

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**
Theory: 25
Practical: 15
C.A: 10

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections (A-D) should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit – I

Introduction to mushroom fungi, Identification of edible and poisonous type, edible mushrooms -- *Pleurotus, Volvariella* and *Agaricus*, medicinal value of mushrooms, preparation of culture, mother spawn production, multiplication of spawn.

Unit – II

Cultivation Technology of button, oyster,paddy straw; and milky mushrooms harvesting, packing and storage; problems in cultivation --- diseases, pests and nematodes, weed moulds and their management strategies. Economics of cultivation, postharvest technologies.

Unit – III

Equipment and sterilization techniques for culture media, isolation of mother culture, spawn preparation and maintenance of mushroom beds,oyster mushroom, *Volvariella* and *Agaricus.*

Unit – IV

Processing and preservation of mushrooms, economics of spawn and mushroom production and Project cost - analysis for mushroom cultivation

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5010

MUSHROOM CULTIVATION

(PRACTICAL)

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CO1: will gain necessary competencies for isolating and culturing the different species of edible fungus.

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CO4: identify the various pest and disease conditions in mushroom houses.

B.Sc. (Hons.) Agriculture (Semester-V)
(Session: 2020-21)

Course Code: BACM-5010

MUSHROOM CULTIVATION

(PRACTICAL)

Time: 3 Hrs **Marks: 15**

Instructions for Practical Examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalya, Jalandhar.

LIST OF EXPERIMENTS

1. Identification of common, edible and poisonous mushrooms
2. To study preparation of media for mycelial culture of mushroom.
3. Preparation of mushroom spawn.
4. Compost preparation for button mushroom production.
5. Button mushroom cultivation conditions for small medium and large scale.
6. Harvesting and packaging techniques of mushroom.
7. Pests and diseases of mushrooms.
8. Oyster mushroom cultivation
9. Cultivation technology of paddy straw and milky mushroom
10. Cost benefit ratio of mushroom cultivation and project formulation
11. Visit to mushroom industrial unit

SUGGESTED READINGS

1. Agrimoon Team 2016. Mushroom culture -horticulture ICAR pdf book.
2. Suman B C & Sharma V P 2007. Mushroom cultivation in India. Daya Publishing House, New Delhi.
3. Biswas S, Datta M & Ngachan S V 2012. Mushrooms: A Manual for Cultivation, PHI Learning Pvt. Ltd., New Delhi, India.
4. Manjit Singh, Bhuvnesh Vijay, Shwet Kamal and Wakchaure G C 2011.Mushrooms cultivation, marketing and consumption. Publisher: Directorate of Mushroom Research, Solan, Himachal Pradesh-India.
5. Bahl Neeta 2006. Handbook on Mushrooms, Oxford and IBH Publishing

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http://ecoursesonline.iasri.res.in/mod/page/view.php?id=103099
http://agricoop.nic.in/sites/default/files/ICAR_8.pdf
http://www.extension.psu.edu/plants/vegetable-fruit/mushrooms/mushroomsubstrate/substrate-preparation-for-white-button-mushrooms
http://www.agritech.tnau.ac.in/farm_enterprises/Farm%20enterprises_%20Mushroom_Post%20harvest.html