

FACULTY OF AGRICULTURE & FORESTRY

SYLLABUS

For

B.Sc. (Hons.) Agriculture (SEMESTER: I-II)
(Credit Based Evaluation and Grading System)

Session: 2019-20



GURU NANAK DEV UNIVERSITY
AMRITSAR

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- (ii) Subject to change in the syllabi at any time.
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B.Sc. (Hons.) Agriculture Semester – I
(Credit Based Evaluation Grading System)

Course No.	Core/ Elective	Course Opted	Course Title	L	T	P	Total
AGL 101	C	Core Course-I	Agricultural Microbiology	1	0	0	1
AGL 102	C	Core Course-II	Fundamentals of Genetics	2	0	0	2
AGL 103	C	Core Course-III	Fundamentals of Soil Science	2	0	0	2
AGL 104	C	Core Course-IV	Introduction to Forestry	1	0	0	1
AGL 105	C	Core Course-V	Fundamentals of Agronomy	3	0	0	3
AGL 106	C	Core Course-VI	Rural Sociology and Educational Psychology	2	0	0	2
AGL 107/ AGL 108	C	Core Course-VII	Introductory Biology / Elementary Mathematics	1 2	0 0	0 0	1 2
AGL 109	C	Core Course-VIII	Agricultural Heritage	1	0	0	1
AGP 121	C	Core Course-I (Practical)	Lab in Agricultural Microbiology	0	0	1	1
AGP 122	C	Core Course-II (Practical)	Lab in Fundamentals of Genetics	0	0	1	1
AGP 123	C	Core Course-III (Practical)	Lab in Fundamentals of Soil Science	0	0	1	1
AGP 124	C	Core Course-IV (Practical)	Lab in Introduction to Forestry	0	0	1	1
AGP 125	C	Core Course-V (Practical)	Lab in Fundamentals of Agronomy	0	0	1	1
AGP 126	C	Core Course-VII (Practical)	Lab in Introductory Biology	0	0	1	1
ENL 101	E	Ability Enhancement Compulsory Course-I	Communicative English - I	2	0	0	2
PBL 121/ PBL 122/ HSL 101	E	Ability Enhancement Compulsory Course-II	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ-I / *ਮੁੱਢਲੀ ਪੰਜਾਬੀ (In lieu of Punjabi Compulsory) / **Punjab History and Culture (1450-1716) (Special paper in lieu of Punjabi)(For those students who are not domicile of Punjab)	2	0	0	2
SOA 101	E	Ability Enhancement Compulsory Course-II	***Drug Abuse: Problem, Management and Prevention(Compulsory) (Compulsory ID Course)	3	0	0	3
			Total	19/ 20			25/ 25

B.Sc. (Hons.) Agriculture Semester – I
(Credit Based Evaluation and Grading System)

Semester - II

Course No.	Core/ Elective	Course Opted	Course Title	L	T	P	Total
AGL 151	C	Core Course-I	Fundamentals of Plant Biochemistry and Biotechnology	2	0	0	2
AGL 152	C	Core Course-II	Fundamentals of Horticulture	1	0	0	1
AGL 153	C	Core Course-III	Soil and Water Conservation Engineering	1	0	0	1
AGL 154	C	Core Course-IV	Fundamentals of Crop Physiology	1	0	0	1
AGL 155	C	Core Course-V	Fundamentals of Agricultural Economics	2	0	0	2
AGL 156	C	Core Course-VI	Fundamentals of Plant Pathology	3	0	0	3
AGL 157	C	Core Course-VII	Fundamentals of Entomology	3	0	0	3
AGL 158	C	Core Course-VIII	Fundamentals of Agricultural Extension Education	2	0	0	2
AGP 171	C	Core Course-I (Practical)	Lab in Fundamentals of Plant Biochemistry and Biotechnology	0	0	1	1
AGP 172	C	Core Course-II (Practical)	Lab in Fundamentals of Horticulture	0	0	1	1
AGP 173	C	Core Course-III (Practical)	Lab in Soil and Water Conservation Engineering	0	0	1	1
AGP 174	C	Core Course-IV (Practical)	Lab in Fundamentals of Crop Physiology	0	0	1	1
AGP 175	C	Core Course-VI (Practical)	Lab in Fundamentals of Plant Pathology	0	0	1	1
AGP 176	C	Core Course-VII (Practical)	Lab in Fundamentals of Entomology	0	0	1	1
AGP 177	C	Core Course-VIII (Practical)	Lab in Fundamentals of Agricultural Extension Education	0	0	1	1
ENL 151	E	Ability Enhancement Compulsory Course-I	Communicative English - II	2	0	0	2
PBL 131 / PBL 132 HSL 102	E	Ability Enhancement Compulsory Course-II	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ- II/ *ਮੁੱਢਲੀ ਪੰਜਾਬੀ (In lieu of Punjabi Compulsory) / **Punjab History and Culture(1717-1947) (Special paper in lieu of Punjabi Compulsory) (For those students who are not domicile of Punjab)	2	0	0	2
SOA 101	E	Ability Enhancement Compulsory Course-II	***Drug Abuse: Problem, Management and Prevention(Compulsory (Compulsory ID Course)	3	0	0	3
			Total	20		7	27

Note-1:

1. *Special Paper in lieu of Punjabi Compulsory.
2. **For those students who are not domicile of Punjab
3. ***Student can opt this Paper whether in 1st or 2nd Semester.

Note-2: PSL -053 ID Course Human Rights & Constitutional Duties (Compulsory). Students can opt. this paper in any semester except the 1st Semester. This ID Course is one of the total ID Course of this course.

AGL-101

Agricultural Microbiology

Time: 3 Hours

Credit 1-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

Introduction. Microbial world: Prokaryotic and eukaryotic microbes. Bacteria: cell structure, chemoautotrophy, photoautotrophy, growth. Genetic recombination- transformation, conjugation and transduction, plasmids, transposons.

SECTION-B

Role of microbes in soil fertility and crop production: Carbon, Nitrogen, Phosphorus and sulphur cycles.

SECTION-C

Biological nitrogen fixation- symbiotic, associative and aysmbiotic. *Azolla*, blue green algae and mycorrhiza. Rhizosphere and phyllosphere.

SECTION-D

Microbes in human welfare: silage production, biofertilizers, biopesticides, biofuel production and biodegradation.

AGL-102

Fundamentals of Genetics

Time: 3 Hours

Credit 2-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity. Architecture of chromosome; chromonemata, chromomeres, centromere, secondary constriction and telomere; special types of chromosomes. Chromosomal theory of inheritance. Cell cycle and cell division- mitosis and meiosis. Probability and Chi-square. Dominance relationships, Epistatic interactions with example

SECTION-B

Multiple alleles, pleiotropism and pseudoalleles. Sex determination and sex linkage, sex limited and sex influenced traits, Blood group genetics, Linkage and its estimation, crossing over mechanisms, chromosome mapping.

SECTION-C

Structural and numerical variations in chromosomes and their implications, Mutation, classification, methods of inducing mutations & CIB technique, mutagenic agents and induction of mutation. Qualitative & Quantitative traits, Polygenes and continuous variations, multiple factor hypothesis, Cytoplasmic inheritance. Genetic disorders.

SECTION-D

Nature, structure & replication of genetic material. Protein synthesis, transcription and translational mechanism of genetic material, Gene concept: Gene structure, function and regulation, Lac and Trp operons.

AGL-103

Fundamentals of Soil Science

Time: 3 Hours

Credit 2-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

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;

SECTION-B

Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity; soils of India; Soil water retention, movement and availability;

SECTION-C

Soil air, composition, gaseous exchange, problem and plant growth; source, amount and flow of heat in soil; soil temperature and plant growth; Soil reaction-pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability;

SECTION-D

Soil colloids - inorganic and organic; silicate clays: constitution and properties; soil organic matter: composition, properties and its influence on soil properties; soil organisms: macro and micro organisms, their beneficial and harmful effects;.

AGL-104

Introduction to Forestry

Time: 3 Hours

Credit 1-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

Introduction – definitions of basic terms related to forestry, objectives of silviculture, forest classification, salient features of Indian Forest Policies. Forest regeneration, Natural regeneration - natural regeneration from seed and vegetative parts, coppicing, pollarding, root suckers;

SECTION-B

Artificial regeneration – objectives, choice between natural and artificial regeneration, essential preliminary considerations. 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;

SECTION-C

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.

SECTION-D

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.

AGL-105

Fundamentals of Agronomy

Time: 3 Hours

Credit 3-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

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

SECTION-B

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

SECTION-C

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

SECTION-D

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.

AGL-106

Rural Sociology & Educational Psychology

Time: 3 Hours

Credit 2-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

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

SECTION-B

Rural society, Social Groups, Social Stratification, Culture concept, Social Institution, Social Change & Development.

SECTION-C

Educational psychology: Meaning & its importance in agriculture extension. Behavior: Cognitive, affective, psychomotor domain.

SECTION-D

Personality, Learning, Motivation, Theories of Motivation, Intelligence

AGL-107

Introductory Biology

Time: 3 Hours

Credit 1-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

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

SECTION-B

Binomial nomenclature and classification Cell and cell division.

SECTION-C

Morphology of flowering plants. Seed and seed germination.

SECTION-D

Plant systematics- viz; Brassicaceae, Fabaceae and Poaceae. Role of animals in agriculture.

AGL-108

Elementary Mathematics

Time: 3 Hours

Credit 2-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

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,

SECTION--B

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.

SECTION--C

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) .

SECTION--D

Definition of function, limit and continuity(of algebraic functions)

Differential Calculus: 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).

Matrix: Definition of Matrices, Addition, Subtraction, Multiplication, Transpose of matrix up to 3rd order.

Determinants: Properties of determinants and their evaluation, Inverse of matrix up to 3rd order. Matrix method.

AGL-109

Agricultural Heritage

Time: 3 Hours

Credit 1-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

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

SECTION-B

Past and present status of agriculture and farmers in society; Journey of Indian agriculture and its development from past to modern era; Plant production and protection through indigenous traditional knowledge;

SECTION-C

Crop voyage in India and world; Agriculture scope; Importance of agriculture and agricultural resources available in India; Crop significance and classifications;

SECTION-D

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

ENL-101

COMMUNICATIVE ENGLISH–I

Credits: 02 (L= 2, T=0, U=0)

Total Marks-100

Mid Semester Marks: 20

End Semester Marks:80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Objective: To introduce students to the skills and strategies of reading and writing by identifying organizational patterns, spotting classification systems and understanding associations between ideas. This course will prepare students to read a variety of texts and also to communicate more effectively through writing. The course will also pay special attention to vocabulary building.

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

Prescribed Text books:

- *The Written Word* by Vandana R. Singh, Oxford University Press, NewDelhi.
- *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, SecondEdition.

SECTION–A

“Word List”, “Correct Usage of Commonly used words and Phrases” from the chapter “Vocabulary” given in *The Written Word* by Vandana R. Singh.

SECTION–B

Letter- writing as prescribed in *The Written Word* by Vandana R. Singh.
Report writing as prescribed in *The Written Word* by Vandana R. Singh.

SECTION–C

Section 1 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, SecondEdition.

SECTION–D

Section 2 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, SecondEdition.

PBL 121 :

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ- I

Credit: 2-0-0

Total Marks: 100

Mid Semester Marks:20

End Semester Marks:80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

ਸੈਕਸ਼ਨ-ਦੇ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਭਾਈ ਵੀਰ ਸਿੰਘ
(ਅ) ਧਨੀ ਰਾਮ ਚਾੜ੍ਹਕ
(ੲ) ਪ੍ਰੋ. ਪੂਰਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਗੁਰਮੁਖੀ ਔਰਥੋਗਰਾਫੀ ਦੀ ਜੁਗਤ (ਪੈਂਤੀ, ਮੁਹਾਰਨੀ, ਬਿੰਦੀ, ਟਿੱਪੀ ਤੇ ਅੱਧਕ); ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹ, ਸ਼ਬਦ ਜੋੜ (ਸੁਧ-ਅਸੁਧ)

ਸੈਕਸ਼ਨ-ਬੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਫਿਰੋਜ਼ਦੀਨ ਸ਼ਰਫ
(ਅ) ਪ੍ਰੋ. ਮੋਹਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਲੇਖ ਰਚਨਾ (ਜੀਵਨੀ-ਪਰਕ, ਸਮਾਜਕ ਅਤੇ ਚਲੰਤ ਵਿਸ਼ਿਆਂ ਉੱਤੇ) : 10 ਲੇਖ ਲਿਖਵਾਉਣੇ
(ਕਲਾਸ ਵਿਚ ਅਤੇ ਘਰ ਲਈ ਅਭਿਆਸ)

ਸੈਕਸ਼ਨ-ਸੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਨੰਦ ਲਾਲ ਨੂਰਪੁਰੀ
(ਅ) ਅਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ
(ੲ) ਡਾ. ਹਰਿਭਜਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਸ਼ੁੱਧ, ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ
(15 ਪੈਰ੍ਹਿਆਂ ਦੇ ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ ਅਭਿਆਸ ਕਰਵਾਉਣੇ)

ਸੈਕਸ਼ਨ-ਡੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ
(ਅ) ਸੁਰਜੀਤ ਪਾਤਰ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਅਖਬਾਰੀ ਇਸ਼ਤਿਹਾਰ : ਨਿੱਜੀ, ਦਫ਼ਤਰੀ ਤੇ ਸਮਾਜਕ ਗਤੀਵਿਧੀਆਂ ਨਾਲ ਸੰਬੰਧਤ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

PBL-122: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

Credits: 2-0-0

Total Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠ-ਕ੍ਰਮ

ਸੈਕਸ਼ਨ-ਏ

ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ,
ਮਾਤ੍ਰਾਵਾਂ (ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ)
ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਤੇ ਵਰਤੋਂ

ਸੈਕਸ਼ਨ-ਬੀ

ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ
ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ
ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ

ਸੈਕਸ਼ਨ-ਸੀ

ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ।
ਸਮਾਨਾਰਥਕ ਤੇ ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ

ਸੈਕਸ਼ਨ-ਡੀ

ਹਫਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਮ, ਇਕ ਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿੱਚ।

HSL:101

Punjab History & Culture (1450-1716)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Credits: 2-0-0

Total Marks: 100

Mid Semester Marks:20

End Semester Marks:80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

1. Land and the People.
2. Bhakti Movement

SECTION-B

3. Life and Teaching of Guru Nanak Dev.
4. Contribution of Guru Angad Dev, Guru Arjun Dev, Guru Amar Das and Guru Ram Das.

SECTION-C

5. Guru Hargobind.
6. Martyrdom of Guru Teg Bahadur

SECTION-D

7. Guru Gobind Singh and the Khalsa.
8. Banda Singh Bahadur: Conquests and Execution.

Suggested Reading

1. Kirpal Singh(ed.), *History and Culture of the Punjab, Part-ii, Punjabi University, Patiala.* 1990.
2. Fauja Singh (ed.), *History of Punjab, Vol, III Punjabi University, Patiala, 1987.*
3. J.S. Grewal, *The Sikhs of the Punjab, Cup, Cambridge, 1991.*
Khushwant Singh, *A History of the Sikhs, Vol. I, OUP, New Delhi, 199*

DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(Student can opt this Paper in 1st or 2nd Semester)

SOA : 101 - PROBLEM OF DRUG ABUSE

Time: 3 Hours

Credit 2-0-0

Total Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION – A

Meaning of Drug Abuse:

- 1) Meaning, Nature and Extent of Drug Abuse in India and Punjab.
- 2) Consequences of Drug Abuse for:

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

SECTION – B

Management of Drug Abuse:

- (i) Medical Management: Medication for treatment and to reduce withdrawal effects.
- (ii) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
- (iii) Social Management: Family, Group therapy and Environmental Intervention.

SECTION – C

Prevention of Drug abuse:

- (i) Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
- (ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

SECTION – D

Controlling Drug Abuse:

- (i) Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
- (ii) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

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. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcoholism*. Harmond Worth: Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society*. New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. Verma, P.S. 2017, “*Punjab’s Drug Problem: Contours and Characteristics*”, Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

AGP-121

Lab in Agricultural Microbiology

Credit 0-0-1

Practical

Introduction to microbiology laboratory and its equipments; Microscope- parts, principles of microscopy, resolving power and numerical aperture. Methods of sterilization. Nutritional media and their preparations. Enumeration of microbial population in soil- bacteria, fungi, actinomycetes. Methods of isolation and purification of microbial cultures. Isolation of *Rhizobium* from legume root nodule. Isolation of *Azotobacter* from soil. Isolation of *Azospirillum* from roots. Staining and microscopic examination of microbes

AGP-122

Lab in Fundamentals of Genetics

Credit 0-0-1

Practical

Study of microscope. Study of cell structure. Mitosis and Meiosis cell division. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross, Experiments on epistatic interactions including test cross and back cross, Experiments on probability and Chi-square test. Determination of linkage and cross-over analysis (through two point test cross and three point test cross data). Study on sex linked inheritance in *Drosophila*. Study of models on DNA and RNA structures.

AGP-123

Lab in Fundamentals of Soil Science

Credit 0-0-1

Practical:

Study of soil profile in field. Study of soil sampling tools, collection of representative soil sample, its processing and storage. Study of soil forming rocks and minerals. Determination of soil density, moisture content and porosity. Determination of soil pH and electrical conductivity. Study of soil map. Determination of soil colour. Estimation of organic matter content of soil.

AGP-124

Lab in Introduction to Forestry

Credit 0-0-1

Practical

Identification of tree-species. Diameter measurements using calipers and tape, diameter measurements of forked, buttressed, fluted and leaning trees. Height measurement of standing trees by shadow method, single pole method and hypsometer. Volume measurement of logs using various formulae. Nursery lay out, seed sowing, vegetative propagation techniques. Forest plantations and their management. Visits of nearby forest based industries.

AGP-125

Lab in Fundamentals of Agronomy

Credit 0-0-1

Practical:

Identification of crops, seeds, fertilizers, pesticides and tillage implements, Effect of sowing depth on germination and seedling vigour, Identification of weeds in crops, Methods of herbicide and fertilizer application, Study of yield contributing characters and yield estimation, Seed germination and viability test, Numerical exercises on fertilizer requirement, plant population, herbicides and water requirement, Use of tillage implements-reversible plough, one way plough, harrow, leveler, seed drill, Study of soil moisture measuring devices, Measurement of field capacity, bulk density and infiltration rate, Measurement of irrigation water.

AGP-126

Lab in Introductory Biology

Credit 0-0-1

Practical

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

AGL-151**Fundamentals of Plant Biochemistry and Biotechnology****Credit 2-0-0****Marks: 100****Mid Semester Marks: 20****End Semester Marks: 80****Mid Semester Examination: 20% weightage****End Semester Examination: 80% weightage****Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

Importance of Biochemistry. Properties of Water, pH and Buffer. Carbohydrate: Importance and classification. Structures of Monosaccharides, Structure of Disaccharides and Polysaccharides. Lipid: Importance and classification. Proteins: Importance of proteins and classification; Structures, zwitterions, nature of amino acids; Structural organization of proteins. Enzymes: General properties; Classification; Mechanism of action.

SECTION-B

Nucleic acids: Importance and classification; Structure of Nucleotides, A, B & Z DNA; RNA: Types and Secondary & Tertiary structure. Metabolism of carbohydrates: Glycolysis, TCA cycle, Electron transport chain. Metabolism of lipids: Beta oxidation, Biosynthesis of fatty acids.

SECTION-C

Concepts and applications of plant biotechnology: embryo culture, anther culture, pollen culture and ovule culture and their applications; Micro-propagation methods; organogenesis and embryogenesis, Synthetic seeds and their significance; somatic hybridization and cybrids;;

SECTION-D

Introduction to recombinant DNA methods: physical (Gene gun method), chemical (PEG mediated) and *Agrobacterium* mediated gene transfer methods; PCR techniques and its applications;

AGL-152
Time: 3 Hours

Fundamentals of Horticulture

Credit 1-0-0
Marks: 100
Mid Semester Marks: 20
End Semester Marks: 80
Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

Horticulture - Its definition and branches, importance and scope; horticultural and botanical classification; principles of orchard establishment; climate and soil for horticultural crops;

SECTION-B

Plant propagation-methods and propagating structures; Seed dormancy, Seed germination,

SECTION-C

Principles and methods of training and pruning, juvenility and flower bud differentiation; unfruitfulness; pollination, pollinizers and pollinators; fertilization and parthenocarpy; medicinal and aromatic plants;

SECTION-D

Importance of plant bio-regulators in horticulture. Irrigation – methods, Fertilizer application in horticultural crops.

AGL-153

Soil and Water Conservation Engineering

Time: 3 Hours

Credit 1-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

- 1) Soil Erosion Principles.
- 2) Erosivity and Erodibility
- 3) Factors affecting water erosion
- 4) Types of water erosion (Raindrop, sheet, rill and gully erosion)

SECTION-B

- 5) Gully classification
- 6) Gully control measures

SECTION-C

- 7) Factors affecting wind erosion
- 8) Wind erosion control measures (wind breaks and shelter belts)

SECTION-D

- 9) Universal Soil loss Equation for water erosion
- 10) Conservation measure for hill slopes
- 11) Conservation measures for agricultural lands

AGL-154

Fundamentals of Crop Physiology

Time: 3 Hours

Credit 1-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

Introduction to crop physiology and its importance in Agriculture; Plant cell: an Overview; Diffusion and osmosis; Absorption of water, transpiration and Stomatal Physiology;

SECTION-B

Mineral nutrition of Plants: Functions and deficiency symptoms of nutrients, nutrient uptake mechanisms;

SECTION-A

Photosynthesis: Light and Dark reactions, C₃, C₄ and CAM plants; Respiration: Glycolysis, TCA cycle and electron transport chain;

SECTION-D

Plant growth regulators: Physiological roles and agricultural uses, Physiological aspects of growth and development of major crops: Growth analysis, Role of Physiological growth parameters in crop productivity.

AGL-155

Fundamentals of Agricultural Economics

Time: 3 Hours

Credit 2-0-0

Marks : 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics: meaning, importance role of Agriculture in economic development. Agricultural planning and development in the country. Population: Malthusian theory, Elements of economic planning.

SECTION-B

Demand: meaning, law of demand, schedule and demand curve, determinants, utility theory; law of diminishing marginal utility, equi-marginal utility principle. Consumer's equilibrium and derivation of demand curve, concept of consumer surplus. Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity.

SECTION-C

Production: input output relationship. *Laws of returns*: Law of variable proportions and law of returns to scale. *Cost*: concepts, short run and long run cost curves. Supply: Stock v/s supply, law of supply, schedule, supply curve, determinants of supply, elasticity of supply. Market structure: meaning and types of market, basic features of perfectly competitive and imperfect markets. Price determination under perfect competition; short run and long run equilibrium of firm and industry,

SECTION-D

National income: Meaning concepts of national income approaches to measurement, difficulties in measurement. Money: Barter system of exchange and its problems, meaning and functions of money, classification of money, Agricultural and public finance: micro v/s macro finance, need for agricultural finance, public revenue and public expenditure. *Tax*: meaning, direct and indirect taxes, agricultural taxation, socialistic and mixed economies,

AGL-156

Fundamentals of Plant Pathology

Time: 3 Hours

Credit 3-0-0

Marks : 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

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, different groups: fungi, bacteria, fastidious vascular bacteria, phytoplasmas, spiroplasmas, viruses, viroids, algae, protozoa, phanerogamic parasites and nematodes with examples of diseases caused by them. Diseases and symptoms due to abiotic causes.

SECTION-B

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, subdivisions, orders and classes. Bacteria and mollicutes: general morphological characters. Basic methods of classification and reproduction. Viruses: nature, structure, replication and transmission. Study of phanerogamic plant parasites.

SECTION-C

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.

SECTION-D

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.

AGL-157

Fundamentals of Entomology

Time: 3 Hours

Credit 3-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

History of Entomology in India. Classification of phylum Arthropoda upto classes. Systematics: Taxonomy –importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order. Classification of class Insecta upto Orders, Special emphasis to orders and families of Agricultural importance like **Orthoptera**: Acrididae, Tettigonidae, Gryllidae; **Dictyoptera**: Mantidae, Blattidae; **Odonata**; **Isoptera**: Termitidae; **Thysanoptera**: Thripidae; **Hemiptera**: Pentatomidae, Pyrrhocoridae, Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae; **Neuroptera**: Chrysopidae; **Lepidoptera**: Pieridae, Noctuidae, Pyralidae, Gelechiidae, Arctiidae, Bombycidae; **Coleoptera**: Coccinellidae, Chrysomelidae, Curculionidae, Bruchidae; **Hymenoptera**: Tenthredinidae, Apidae, Trichogrammatidae, Ichneumonidae, Braconidae; **Diptera**: Cecidomyiidae, Culicidae, Muscidae, Tephritidae.

SECTION-B

Morphology: Structure and functions of insect cuticle and molting. Body segmentation. Structure and modifications of insect antennae, mouth parts, legs, Wing modifications and wing coupling apparatus. Structure of male and female genital organ. Metamorphosis and diapause in insects. Types of larvae and pupae. Structure and functions of digestive, circulatory, excretory, respiratory, nervous and reproductive system in insects. Types of reproduction in insects. Major sensory organs like simple and compound eyes, chemoreceptor.

SECTION-C

Insect Ecology: Introduction, Environment and its components. Effect of abiotic factors– temperature, moisture, humidity, rainfall, light. Effect of biotic factors – food competition, natural and environmental resistance. Major points related to dominance of class Insecta in Animal kingdom. Various categories of pests.

SECTION-D

Concept of IPM, Practices, scope and limitations of IPM. Classification of insecticides, toxicity of insecticides and formulations of insecticides. Chemical control- importance, hazards and limitations. Recent methods of pest control, repellents, antifeedants, hormones, attractants, gamma radiation. Insecticides Act 1968- Important provisions. Symptoms of poisoning, first aid and antidotes.

AGL-158

Fundamentals of Agricultural Extension Education

Time: 3 Hours

Credit 2-0-0

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

Education: Meaning, definition & Types; Extension Education- meaning, definition, scope and process; objectives and principles of Extension Education; Extension Programme planning- Meaning, Process, Principles and Steps in Programme Development. Extension systems in India:

SECTION-B

Extension efforts in pre-independence era (Sriniketan, Marthandam, Firka Development Scheme, Gurgaon Experiment, etc.) and post-independence era (Etawah Pilot Project, Nilokheri Experiment, etc.); various extension/ agriculture development programmes launched by ICAR/Govt. of India (IADP, IAAP, HYVP, KVK, IVLP, ORP, ND, NATP, NAIP etc.), New trends in agriculture extension, cyber extension/e-extension, expert system etc. Rural Development: concept, meaning, definition; Community Dev.-meaning, definition, concept & principles.

SECTION-C

Philosophy of C.D. Rural Leadership: concept and definition, types of leaders in rural context; extension administration: meaning and concept, principles and functions. Monitoring and evaluation: concept and definition, monitoring and evaluation of extension programmes; transfer of technology: extension teaching methods: meaning, classification, individual, group and mass contact methods.

SECTION-D

Principles and Functions of Communication, models and barriers to communication. Agriculture journalism; diffusion and adoption of innovation: concept and meaning, process and stages of adoption, adopter categories.

ENL-151

COMMUNICATIVE ENGLISH–II**Credits: 02 (L= 2, T=0, U=0)****Total Marks: 100****Mid Semester Marks: 20****End Semester Marks: 80****Mid Semester Examination: 20% weightage****End Semester Examination: 80% weightage**

Objective: To introduce students to the skills and strategies of reading and writing by identifying organizational patterns, spotting classification systems and understanding associations between ideas. This course will prepare students to read a variety of texts and also to communicate more effectively through writing. The course will also pay special attention to vocabulary building.

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

Prescribed Text books:

- *The Written Word* by Vandana R. Singh, Oxford University Press, NewDelhi.
- *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, SecondEdition.

SECTION–A

Practical question on Note Making, Summarizing and Abstracting as given in *The Written Word* by Vandana R. Singh

SECTION–B

Practical question on Paragraph writing as prescribed in *The Written Word* by Vandana R. Singh

SECTION–C

Theoretical questions based on ABC of Good Notes as prescribed in *The Written Word* by Vandana R. Singh.

Section C from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, SecondEdition.

SECTION–D

Practical question on Essay writing from *The Written Word* by Vandana R. Singh

Section 4 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, SecondEdition.

PBL 131

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ- II

Credit : 2-0-0

Total Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਸੈਕਸ਼ਨ-ਦੋ

- I. ਦੋ ਰੰਗ (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਨਾਨਕ ਸਿੰਘ : ਭੂਆ
(ਅ) ਗੁਰਮੁਖ ਸਿੰਘ ਮੁਸਾਫਿਰ : ਬਾਗੀ ਦੀ ਧੀ
(ੳ) ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ : ਪੇਮੀ ਦੇ ਨਿਆਣੇ
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ/ਮੂਲ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਵਿਉਂਤਪਤ ਅਤੇ ਰੁਪਾਂਤਰੀ), ਸਮਾਸ।

ਸੈਕਸ਼ਨ-ਬੀ

- I. ਦੋ ਰੰਗ (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਸੁਜਾਨ ਸਿੰਘ : ਬਾਗਾਂ ਦਾ ਰਾਖਾ
(ਅ) ਕਰਤਾਰ ਸਿੰਘ ਦੁੱਗਲ : ਤੈਂ ਕੀ ਦਰਦ ਨਾ ਆਇਆ
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਪੈਰ੍ਹਾ ਰਚਨਾ : ਕਲਾਸ ਵਿਚ 10 ਵਿਸ਼ਿਆਂ (ਸਭਿਆਚਾਰ, ਧਾਰਮਕ ਅਤੇ ਰਾਜਨੀਤਕ) 'ਤੇ ਪੈਰ੍ਹਾ ਰਚਨਾ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ।

ਸੈਕਸ਼ਨ-ਸੀ

- I. ਦੋ ਰੰਗ (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ : ਧਰਤੀ ਹੇਠਲਾ ਬੋਲਦ

B.Sc. (Hons.) Agriculture Semester – II
(Credit Based Evaluation and Grading System)

- (ਅ) ਨਵਤੇਜ ਸਿੰਘ : ਦੂਜੀ ਵਾਰ ਜੇਬ ਕੱਟੀ ਗਈ
(ੲ) ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ : ਲੱਛਮੀ
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)

- II. ਮੁਹਾਵਰੇ ਤੇ ਅਖਾਣ (ਅਖਾਣ ਤੇ ਮੁਹਾਵਰਾ ਕੋਸ਼ ਵਿਚ) 200 ਮੁਹਾਵਰਿਆਂ ਅਤੇ 100 ਅਖਾਣਾਂ ਨੂੰ ਵਾਕਾਂ ਵਿਚ ਵਰਤਣ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ (ਕਲਾਸ ਵਿਚ ਤੇ ਘਰ ਲਈ)।

ਸੈਕਸ਼ਨ-ਡੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਅਜੀਤ ਕੌਰ : ਬੁੱਤ ਸ਼ਿਕਨ
(ਅ) ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ : ਬੱਸ ਕੰਡਕਟਰ
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸੰਬੰਧਕ

PBL-132:ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

Credits: 2-0-0 Total

Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠ-ਕ੍ਰਮ

ਸੈਕਸ਼ਨ-ਏ

ਸਬਦ ਸ੍ਰਣਾਅ : ਪਛਾਣ ਅਤੇ ਵਰਤ

(ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਸ਼ਸ਼ਣ)

ਸੈਕਸ਼ਨ-ਬੀ

ਨਤ ਵਰਤ ਦਾ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲਾ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਸ਼ਤ-ਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰਧੰਦਿਆਂ ਨਾਲ ਸਬੰਧਤ ।

ਸੈਕਸ਼ਨ-ਸੀ

ਪੰਜਾਬੀ ਵਾਕ-ਬਣਤਰ

ਸਾਧਾਰਨ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤ)

ਸੰਯੁਕਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਮਿਸ਼ਰਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਸੈਕਸ਼ਨ-ਡੀ

ਪੜ੍ਹਾ ਰਚਨਾ

ਸੰਖੇਪ ਰਚਨਾ

HSL:102

Punjab History & Culture (1717-1947)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Credits: 2-0-0

Total Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION-A

1. Sikh Struggle for Sovereignty.
2. Ranjit Singh : Conquests, Administration and the Anglo-Sikh Relations.

SECTION-B

3. Anglo-Sikh Wars and the Annexation.
4. The Punjab under the British: New Administration, Education and social Change.

SECTION-C

5. Economic Changes: Agricultural
6. Socio-Religious Reform Movements.

SECTION-D

7. Role of Punjab in the Freedom Struggle.
8. Fairs and Festivals.

Suggested Reading

1. Kirpal Singh (ed.), *History and Culture of the Punjab*, Part-II, Punjabi University, Patiala, 1990.
2. Fauja Singh (ed.), *History of Punjab*, Vol, III, Punjabi University, Patiala, 1987.
3. J.S. Grewal, *The Sikhs of the Punjab*, Cup, Cambridge, 1991.
4. Khushwant Singh, *A History of the Sikhs*, Vol. I, OUP, New Delhi, 1990

DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(Student can opt this Paper in 1st or 2nd Semester)

SOA : 101 - PROBLEM OF DRUG ABUSE

Time: 3 Hours

Credit 3-0-0

Total Marks: 100

Mid Semester Marks: 20

End Semester Marks: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). 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.

SECTION – A

Meaning of Drug Abuse:

- 1) Meaning, Nature and Extent of Drug Abuse in India and Punjab.
- 2) Consequences of Drug Abuse for:

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

SECTION – B

Management of Drug Abuse:

- (i) Medical Management: Medication for treatment and to reduce withdrawal effects.
- (ii) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
- (iii) Social Management: Family, Group therapy and Environmental Intervention.

SECTION – C

Prevention of Drug abuse:

- (i) Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
- (ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

SECTION – D

Controlling Drug Abuse:

- (i) Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
- (ii) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

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. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcoholism*. Harmond Worth: Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society*. New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. Verma, P.S. 2017, “*Punjab’s Drug Problem: Contours and Characteristics*”, Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

AGP-171 Lab in Fundamentals of Plant Biochemistry and Biotechnology

Credit 0-0-1

Practical

Preparation of solution, pH & buffers, Qualitative tests of carbohydrates, amino acids and proteins. Paper chromatography, Sterilization techniques. Composition of various tissue culture media and preparation of stock solutions for MS nutrient medium. Callus induction from various explants, micropropagation.

AGP-172:

Lab in Fundamentals of Horticulture

Credit 0-0-1

Practical

Identification of garden tools. Identification of horticultural crops. Preparation of seed bed/nursery bed. Practice of sexual and asexual methods of propagation including micro-propagation. Layout and planting of orchard. Training and pruning of fruit trees. Preparation of potting mixture. Fertilizer application in different crops. Visits to commercial nurseries/orchard.

AGP-173

Lab in Soil and Water Conservation Engineering

Credit 0-0-1

Practical:

- 1) General Status of Soil Conservation in India
- 2) Calculation of erosion index
- 3) Estimation of soil loss
- 4) Design of contour bunds
- 5) Design of graded bunds
- 6) Design of bench terracing system
- 7) Problems on wind erosion

AGP-174

Lab in Fundamentals of Crop Physiology

Credit 0-0-1

Practical

Study of plant cells, structure and distribution of stomata, imbibitions, osmosis, plasmolysis, measurement of root pressure, rate of transpiration, Separation of photosynthetic pigments through paper chromatography, photosynthesis, respiration, tissue test for mineral nutrients, estimation of relative water content.

AGP-175

Lab in Fundamentals of Plant Pathology

Credit 0-0-1

Practical:

Acquaintance with various laboratory equipments and microscopy. Collection and preservation of disease specimen. Preparation of media, isolation and Koch's postulates. General study of different structures of fungi. Study of symptoms of various plant diseases. Study of representative fungal genera. Transmission of plant viruses. Study of phanerogamic plant parasites.

Study of fungicides and their formulations. Methods of pesticide application and their safe use. Calculation of fungicide sprays concentrations.

AGP-176

Lab in Fundamentals of Entomology

Credit 0-0-1

Practical:

Methods of collection and preservation of insects including immature stages;

External features of Grasshopper

Types of insect antennae, mouthparts and legs; Wing venation, types of wings and wing coupling apparatus. Types of insect larvae and pupae;

Dissection of digestive system in insects (Grasshopper); Dissection of male and female reproductive systems in insects (Grasshopper);

Study of characters of orders Orthoptera, Dictyoptera, Odonata, Isoptera, Thysanoptera, Hemiptera, Lepidoptera, Neuroptera, Coleoptera, Hymenoptera, Diptera and their families of agricultural importance.

Insecticides and their formulations. Pesticide appliances and their maintenance.

Sampling techniques for estimation of insect population and damage

AGP-177

Lab in Fundamentals of Agricultural Extension Education

Credit 0-0-1

Practical:

To get acquainted with university extension system. Group discussion- exercise; handling and use of audio visual equipments and digital camera and LCD projector; preparation and use of AV aids, preparation of extension literature – leaflet, booklet, folder, pamphlet news stories and success stories; Presentation skills exercise; micro teaching exercise; Role of community radio and television studio for understanding the process of programme production; script writing, writing for print and electronic media, developing script for radio and television.