INDIRA GANDHI KRISHI VISHWAVIDYALAYA, KRISHAK NAGAR, RAIPUR 492012

No.ACD-I/ACM (106-03)/2016/ 1968 Raipur, Dated 22/07/2016

NOTIFICATION

The Academic Council in its 106th Meeting held on 15th July 2016, discuss the recommendation of 5th Deans Committee of ICAR and principally agreed its adoption w.e.f. academic session 2016-17 First Year – First Semester in all the Under graduate programme of Agriculture, Agricultural Engineering and Horticulture at Indira Gandhi Krishi Vishwavidyalaya, Raipur.

The Council also decided that Dean of Agriculture and Agricultural Engineering Faculty along with other college Deans and Head of Department will organize a group meeting to finalize the list of courses, syllabus, lecture-wise distribution, examination and evaluation pattern and other guidelines in view of 5th Deans Committee recommendations.

Looking to the date of registration i.e. 23rd July 2016 for First Year First Semester students, the list of courses for First Year – First Semester academic session 2016-17 has been finalized and attached as Annexure A, B and C. These courses will also be applicable to repeat student of First Year. The entry of new courses in IGKVMIS may take some time. Therefore, all the Deans and Principals are requested to start the process of registration with new courses and start the classes timely.

REGISTRAR 22/7/16

End. No. ACD-I/ACM (106.03)/2016/ 1969 Raipur, Dated 22-07-2016

Copy for information and necessary action :-

1. The Director of Instructions, IGKV, Krishak Nagar, Raipur 492 012 (Chhattisgarh).
2. The Dean Students Welfare, IGKV, Krishak Nagar, Raipur 492 012 (Chhattisgarh).
3. The Dean, College of Agriculture, Krishak Nagar, Raipur 492 012 (Chhattisgarh).
4. The Dean, T.C.B. College of Agriculture & Research Station, Sarkanda Farm, Bilaspur 495 001 (Chhattisgarh).
5. The Dean, S.G. College of Agriculture & Research Station, Kumhrawand Farm, Jagdalpur 494 005 (Chhattisgarh).
6. The Dean, R.M.D. College of Agriculture & Research Station, Ajirma Farm, Ambikapur 497001 (Chhattisgarh).
7. The Dean, S. K. College of Agriculture and Research Station, Kawardha, Kabirdham 491995 (Chhattisgarh).
8. The Dean, College of Agriculture, Janjgir-Champa (Chhattisgarh).
9. The Dean, DKS College of Agriculture & Research Station, Bhatapara, Distt.-Baloda Bazar -Bhatapara 493118 (Chhattisgarh).
10. The Dean, College of Agriculture, Bemetara / SKS College of Agriculture, Rajnandgaon / Koriya / Raigarh / Kanker (Chhattisgarh).
11. The Dean, Pt. KL Shukla College of Horticulture, Rajnandgaon (Chhattisgarh) / College of Horticulture, Jagdalpur (Chhattisgarh).
12. The Dean, B.R.S.M. College of Agricultural Engineering and Technology, Pandariaya Road, IGKV, Mungeli 495 334 (Chhattisgarh).
13. The Dean, SV College of Agricultural Engineering & Technology and Research Station, IGKV, Krishak Nagar, Raipur 492 012 (Chhattisgarh).
14. The Professor & Head, Department of----------, CoA, Raipur / FAE, IGKV, Raipur.
15. The Deputy Controller of Examination, IGKV, Krishak Nagar, Raipur 492 012 (Chhattisgarh).
16. The Nodal Officer, IGKVMIS, IGKV, Krishak Nagar, Raipur for entry of new courses in IGKVMIS for registration purpose.
17. The PA to Hon'ble V.C., IGKV, Krishak Nagar, Raipur 492 012 (Chhattisgarh).

18. The Assistant Account Officer, Office of the Dean – COA, Raipur /SVCAET, FAE, IGKV, Raipur
19. The Principal, Bharti College of Agriculture, Padmanbhpur, Pulgon Chouk, Durg (Chhattisgarh)
20. The Principal, Bhoramdeo College of Agriculture, Kawardha - 491 1005 (Chhattisgarh)
21. The Principal, Chhattisgarh College of Agriculture, Risali (Bhilai), Dhanora Road, Village - Dhanora, Post - Hanoda, Durg (Chhattisgarh)
22. The Principal, College of Agriculture, Near Gayatri Temple, Ambagarh Chwoki, Rajnandgaon (Chhattisgarh)
23. The Principal, College of Agriculture, In front of Collector Office, Dantewada (Chhattisgarh)
24. The Principal, College of Agriculture, Jorapali (Kenapali) Road, Raigarh (Chhattisgarh)
25. The Principal, Mahamaya College of Agriculture, Nagri Road, Village-Siyadehi, Post - Aroud, Dhamtari (Chhattisgarh)
26. The Principal, Mardarshan Sansthan College of Agriculture, Ring Road, Chopra Para, Ambikapur, Sarguja - 497 001 (Chhattisgarh)
27. The Principal, Shriram College of Agriculture, Shriram Prisar, Village - Thakur Tola, Post - Somani, Rajnandgaon (Chhattisgarh)
28. The Principal, Danteshwari College of Horticulture, Near Manoupchar Hospital, Mana Basti, Dhamtrai Raod, Raipur (Chhattisgarh)
29. The Principal, Gayatri College of Horticulture, Gokulpur Rudri Road, Dhamtari (Chhattisgarh)
30. The Principal, Kanhaiya Lal College of Horticulture, Dhamtari (Chhattisgarh)
31. The Principal, Rani Durgawati College of Horticulture, Meduka, Pendra Road, Distt. - Bilaspur (Chhattisgarh)
32. The Principal, Chhattisgarh College of Agricultural Engineering, Risali (Bhilai), Dhanora Road, Village - Dhanora, Post - Hanoda, Durg (Chhattisgarh)
33. The Principal, Bharti College of Agricultural Engineering, Padmanbhpur, Pulgon Chouk, Durg (Chhattisgarh).
34. The In-charge, University Web-site, IGKV, Krishak Nagar, Raipur 492012 (Chhattisgarh) for up-loading the same.

Indira Gandhi Krishi Vishwavidyalaya ★ Raipur (Chhattisgarh) ★ 1987

REGISTRAR
22/7/16

List of courses for 1st Year 1st Semester approved in 106th Academic Council Meeting held on 15th July 2016 and effective from academic session 2016-17 First Year First Semester

Annexure – A

Applicable for B.Sc. (Agriculture) First Year First Semester Academic Session 2016-17

I Semester			
1.	AHORT 5111	Fundamentals of Horticulture	2 (1+1)
2.	ASOIL 5111	Fundamentals of Soil Science	3(2+1)
3.	AFOR 5111	Introduction to Forestry	2 (1+1)
4.	AGRO 5111	Fundamentals of Agronomy	4 (3+1)
5.	AEC 5111	Fundamentals of Agricultural Economics	2 (2+0)
6.	AEXT 5111	Rural Sociology & Educational Psychology	2 (2+0)
7.	AENT 5111	Fundamentals of Entomology	4 (3+1)
8.	AHPD 5111	Human Values & Ethics (non gradial)	1 (0+1)
9.	APEY 5111	NSS/NCC/Physical Education & Yoga Practices	2 (0+2)
TOTAL			**22 (14+8)**

Indira Gandhi Krishi Vishwavidyalaya Raipur (Chhattisgarh) 1987

B.Sc. (Agriculture)

List of courses for 1st Year 1st Semester approved in 106th Academic Council Meeting held on 15th July 2016 and effective from academic session 2016-17 First Year First Semester

1. AHORT 5111 Fundamentals of Horticulture 2 (1+1)

SYLLABUS

Theory

Horticulture - Its definition and branches, importance and scope; horticultural and botanical classification; climate and soil for horticultural crops; Plant propagation-methods and propagating structures; Seed dormancy, Seed germination, principles of orchard establishment; Principles and methods of training and pruning, juvenility and flower bud differentiation; unfruitfulness; pollination, pollinizers and pollinators; fertilization and parthenocarpy; medicinal and aromatic plants; importance of plant bio-regulators in horticulture. Irrigation – methods, Fertilizer application in horticultural crops.

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.

Theory (Period wise distribution)

1 Horticulture - Its definition and branches, importance and scope; horticultural and botanical classification; climate and soil for horticultural crops-2
2 Plant propagation-methods and propagating structures;
3 Seed dormancy, Seed germination, principles of orchard establishment-2
4 Principles and methods of training and pruning, juvenility and flower bud differentiation; unfruitfulness-2
5 Pollination, pollinizers and pollinators;
6 Fertilization and parthenocarpy;
7 Medicinal and aromatic plants;
8 Importance of plant bio-regulators in horticulture.
9 Irrigation – methods, Fertilizer application in horticultural crops.

Practical (Periodwise distribution)

1 Identification of garden tools.
2 Identification of horticultural crops.
3 Preparation of seed bed/nursery bed-2.
4 Practice of sexual and asexual methods of propagation including micro-propagation-2
5 Layout and planting of orchard.
6 Training and pruning of fruit trees.
7 Preparation of potting mixture.
8 Fertilizer application in different crops.
9 Visits to commercial nurseries/orchard-2

Suggested Reading:

Prasad and Kumar, 2014. *Principles of Horticulture* 2nd Edn. Agrobios (India).
Neeraj Pratap Singh, 2005. *Basic concepts of Fruit Science* 1st Edn. IBDC Publishers.
Gardner/Bardford/Hooker. J.R., 1957. *Fundamentals of Fruit Production*. Mac Graw Hill Book Co., New York.

Edmond,J.B, Sen,T.L, Andrews,F.S and Halfacre R.G., 1963. *Fundamentals of Horticulture*. Tata Mc Graw Hill Publishing Co., New Delhi.

Kumar, N., 1990. *Introduction to Horticulture*. Rajyalakshmi publications, Nagarcoil, Tamilnadu

Jitendra Singh, 2002. *Basic Horticulture*. Kalyani Publishers, Hyderabad.

Denisen E.L.,1957. *Principles of Horticulture*. Macmillan Publishing Co., New York.

Chadha,K.L.(ICAR),2002,2001. *HandbookofHorticulture* . ICAR, NewDelhi

K.V.Peter, 2009. *Basics Horticulture.* New India Publishing Agency

Kausal Kumar Misra and Rajesh Kumar, 2014. *Fundamentals of Horticulture*. Biotech Books.

D.K. Salunkhe and S.S. Kadam, 2013. *A handbook of Fruit Science and Technology*. CRC Press.

S. Prasad and U. Kumar, 2010. *A handbook of Fruit Production*. Agrobios (India).

Jitendra Singh, 2011. *Basic Horticulture*. Kalyani Publications, New Delhi.

2. ASOIL 5111 Fundamentals of Soil Science 3(2+1)

Theory

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

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 texture by feel and Bouyoucos Methods. Studies of capillary rise phenomenon of water in soil column and water movement in soil. Determination of soil pH and electrical conductivity. Determination of cation exchange capacity of soil. Study of soil map. Determination of soil colour. Demonstration of heat transfer in soil. Estimation of organic matter content of soil.

Theory (Periodwise distribution)

1 Soil as a natural body, Pedological and edaphological concepts of soil-2
2 Soil genesis: soil forming rocks and minerals; weathering, processes and factors of soil formation-3
3 Soil Profile, components of soil-2
4 Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity-2
5 Elementary knowledge of soil taxonomy classification and soils of India; Soil water retention, movement and availability-2
6 Soil air, composition, gaseous exchange, problem and plant growth, Soil temperature; source, amount and flow of heat in soil-2
7 Effect on plant growth, Soil reaction-ph, soil acidity and alkalinity, buffering, effect of ph on nutrient availability-2
8 Soil colloids - inorganic and organic; silicate clays: constitution and properties; sources of charge; ion exchange, cation exchange capacity, base saturation-2
9 Soil organic matter: composition, properties and its influence on soil properties; humic substances - nature and properties-2
10 Soil organisms: macro and micro organisms, their beneficial and harmful effects-2
11 Soil pollution - behaviour of pesticides and inorganic contaminants, prevention and mitigation of soil pollution-2

Practical (Periodwise distribution)

1 Study of soil profile in field.

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

Suggested reading:

Brady Nyle C and Ray R Well, 2014. *Nature and properties of soils*. Pearson Education Inc., New Delhi.
Indian Society of Soil Science, 2002. *Fundamentals of Soil Science*. IARI, New Delhi.
Sehgal J. A., 2005. *Textbook of Pedology Concepts and Applications*. Kalyani Publishers, New Delhi.
Dilip Kumar Das, 2015. Introductory Soil Science. Kalyani Publishers, Ludhiana.
Biswas, T.D. and Mukharjee, S.K., 2015. *Text Book of Soil science*. Tata Mc Graw Hill Publishing Co. Ltd., New Delhi.
Brady, N.C., 1995. *The Nature and properties of Soils*. Macmillan Publishing Co, New York.
Ghildyal, B.P. and Tripathi, R.P., 1987. *Soil Physics*. Acad. Press. New York.
Kolay, A.K., 1983. *Basic concepts of Soil Science*. Wiley Eastern Ltd., New Delhi
Brady, N. C. and Weil, R. R., 2010. *Elements of the Nature and Properties of Soils* (3rd Edition), Pearson Education, New Delhi.
Foth, H.D., 1991. *Fundamentals of Soil Science* (8th Edition), John Wiley & Sons, New Delhi.
Das, D .K., 2011. *Introductory Soil Science* (3rd Edition), Kalyani publisher, Ludhiana (India).
Khan, T. O. 2013 Forest Soils: *Properties and Management*. Springer International Publishing, Switzerland
Pritchett and Fisher RF, 1987. *Properties and Management of Forest Soils*. John Wiley, New York.
Gupta, P.K. 2009. *Soil, Plant, Water and Fertilizer Analysis* (2nd Edition), AGROBIOS, Jodhpur (India).
Jaiswal, P.C. 2006. *Soil, Plant and Water Analysis* (2nd Edition), Kalyani Publishers, Ludhiana.
Jackson, M. L. 2012. Soil Chemical Analysis: Advanced Course, Scientific Publisher

3. AFOR 5111 Introduction to Forestry 2 (1+1)

Theory

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; 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; 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. 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.

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.

Theory (Periodwise distribution)

1 Introduction – definitions of basic terms related to forestry, objectives of silviculture, forest classification, salient features of Indian Forest Policies.
2 Forest regeneration, Natural regeneration - natural regeneration from seed and vegetative parts, coppicing, pollarding, root suckers;
3 Artificial regeneration – objectives, choice between natural and artificial regeneration, essential preliminary considerations.
4 Crown classification.
5 Tending operations – weeding, cleaning, thinning – mechanical, ordinary, crown and advance thinning.
6 Forest mensuration – objectives, diameter measurement, instruments used in diameter measurement;
7 Non instrumental methods of height measurement - shadow and single pole method;
8 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.-2
9 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-2
10 Cultivation practices of two important fast growing tree species of the region.

Practical (Periodwise distribution)

1 Identification of tree-species. -2

2 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. -2
3 Volume measurement of logs using various formulae. -2
4 Nursery lay out, seed sowing, vegetative propagation techniques. -2
5 Forest plantations and their management. -2
6 Visits of nearby forest based industries.-2

Suggested Reading

Beazley, M. 1981. The International Book of Forest. London
Champion and Seth. 1968. Forest types of India.
Grebner, D.L., Bettinger, P. and Siry, J.P. 2012. *Introduction to Forestry and Natural Resources*. Academic Press. 508p (Google eBook).
Khanna, L.S. 1989. *Principles and Practice of Silviculture*. Khanna Bandhu, New Delhi.
Mitchell Beazly.1981. *The International Book of the Forest*. Mitchell Beazly Publishers, London.
Mather, A.S. 1990. *Global Forest Resources*. Belhaven, London
Persson, R. 1992. *World Forest Resources*. Periodical Experts, New Delhi.
Westoby, J. 1991. *Introduction to World Forestry*. Wiley, 240p.

4. AGRO 5111 Fundamentals of Agronomy 4 (3+1)

Theory

Agronomy and its scope, seeds and sowing, tillage and tilth, crop density and geometry, Crop nutrition, manures and fertilizers, nutrient use efficiency, water resources, soil-plant-water relationship, crop water requirement, water use efficiency, irrigation- scheduling criteria and methods, quality of irrigation water, water logging.

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

Practical

Identification of crops, seeds, fertilizers, pesticides and tillage implements, study of agro-climatic zones of India, 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.

Theory (Periodwise distribution)

1 Agronomy and its scope,
2 seeds and sowing,
3 tillage and tilth,
4 crop density and geometry
5 Crop nutrition
6 manures and fertilizers
7 nutrient use efficiency
8 water resources
9 soil-plant-water relationship-2
10 crop water requirement
11 water use efficiency
12 irrigation- scheduling criteria and methods
13 quality of irrigation water, water logging-2
14 Weeds- importance, classification-2
15 crop weed competition-2
16 concepts of weed management-principles and methods-2
17 herbicides- classification, selectivity and resistance, allelopathy-2
18 Growth and development of crops-2
19 factors affecting growth and development-2
20 plant ideotypes-2
21 crop rotation and its principles-2
22 adaptation and distribution of crops-2
23 crop management technologies in problematic areas-2
24 harvesting and threshing of crops.

Practical (Period wise distribution)

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

Suggested Readings

William L Donn. 1965. Meteorology. McGraw-Hill Book Co. New York.

Arnon L. 1972. Crop Production in Dry Regions. Leonard Hill Publishing Co. London.

Yawalkar K S and Agarwal J P. 1977. Manures and Fertilizers. Agricultural Horticultural Publishing House, Nagpur.

Gupta O P. 1984. Scientific Weed Management in the Tropics and Sub- Tropics. Today and Tomorrow's Printers and Publishers. New Delhi.

Rao V S. 1992. Principles of Weed Science. Oxford and IBH Publishing Co. Ltd. New Delhi.

Reddy Yellamanda T and Shankar Reddy G H. 1995. Principles of Agronomy. Kalyani Publishers Ludhiana.

5. AEC 5111 Fundamentals of Agricultural Economics 2 (2+0)

Theory

Economics: Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macro economics. Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development. Agricultural planning and development in the country. *Demand:* meaning, law of demand, 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. Production: process, creation of utility, factors of production, Supply: Stock v/s supply, law of supply, Distribution theory: meaning, factor market, and pricing factors of production. Concepts of rent, wage, interest and profit. *National income:* Meaning and importance, circular flow, concepts of national income accounting , approaches to measurement, difficulties in measurement. Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programmes on population control. Money: Barter system of exchange and its problems, evolution, meaning and functions of money, classification of money, money supply, general price index, inflation and deflation. Banking: Role in modern economy, types of banks, Public finance, public revenue and public expenditure. *Tax:* meaning, direct and indirect taxes, agricultural taxation, VAT. *Economic systems:* Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning.

Theory (Period wise distribution)

1 *Economics:* Meaning, scope and subject matter, definitions,
2 Activities, approaches to economic analysis; micro and macro economics.
3 Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development. - 2
4 Agricultural planning and development in the country. *Demand:* meaning, law of
5 Demand, demand schedule and demand curve, determinants, utility theory; - 2
6 Law of diminishing marginal utility, equi-marginal utility principle.
7 Consumer's equilibrium and derivation of demand curve, concept of consumer surplus.
8 Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity.
9 Production: process, creation of utility, factors of production,
10 Supply: Stock v/s supply, law of supply,
11 Distribution theory: meaning, factor market, and pricing factors of production.
12 Concepts of rent, wage, interest and profit.
13 *National income:* Meaning and importance, circular flow, concepts of national income accounting
14 Approaches to measurement, difficulties in measurement. Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants,
15 Current policies and programmes on population control.
16 Money: Barter system of exchange and its problems, evolution, meaning and functions of money,

List of courses for 1st Year 1st Semester approved in 106th Academic Council Meeting held on 15th July 2016 and effective from academic session 2016-17 First Year First Semester

17 Classification of money, money supply, general price index, inflation and deflation.
18 Banking: Role in modern economy, types of banks,
19 Public finance, public revenue and public expenditure.
20 *Tax:* meaning, direct and indirect taxes, agricultural taxation,
21 VAT. *Economic systems:* Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning - 2

6. AEXT 5111 Rural Sociology & Educational Psychology 2 (2+0)

Theory

Sociology and Rural sociology: Definition and scope, its significance in agriculture extension, Social Ecology, Rural society, Social Groups, Social Stratification, Culture concept, Social Institution, Social Change & Development. Educational psychology: Meaning & its importance in agriculture extension. Behavior: Cognitive, affective, psychomotor domain, Personality, Learning, Motivation, Theories of Motivation, Intelligence.

Theory (Period wise distribution)

1 Sociology and Rural sociology: Definition and scope, its significance in agriculture extension - 2

2 Social Ecology -2

3 Rural society -2

4 Social Groups -2

5 Social Stratification -2

6 Culture concept -2

7 Social Institution -2

8 Social Change & Development. Educational psychology -2

9 Meaning & its importance in agriculture extension. -2

10 Behavior: Cognitive, affective, psychomotor domain -2

11 Personality, Learning, Motivation -2

12 Theories of Motivation, Intelligence -2

7. AENT 5111 Fundamentals of Entomology 4 (3+1)

Theory

1. Fundamentals of Entomology 4 (3+1)

Part – I-

History of Entomology in India. Major points related to dominance of Insecta in Animal kingdom. Classification of phylum Arthropoda upto classes. Relationship of class Insecta with other classes of Arthropoda. Morphology: Structure and functions of insect cuticle and molting. Body segmentation. Structure of Head, thorax and abdomen. Structure and modifications of insect antennae, mouth parts, legs, Wing venation, 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, secretary (Endocrine) and reproductive system, in insects. Types of reproduction in insects. Major sensory organs like simple and compound eyes, chemoreceptor.

Part-II

Insect Ecology: Introduction, Environment and its components. Effect of abiotic factors– temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents. Effect of biotic factors – food competition, natural and environmental resistance.

Part III

Categories of pests. 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. Application techniques of spray fluids. Symptoms of poisoning, first aid and antidotes.

Part – IV

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, basic groups of present day insects with special emphasis to orders and families of Agricultural importance like Orthoptera: Acrididae, Tettigonidae, Gryllidae, Gryllotalpidae; Dictyoptera: Mantidae, Blattidae; Odonata; Isoptera: Termitidae; Thysanoptera: Thripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae, Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidae, Aleurodidae, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera: Pieridae, Papiloinidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidae, Bruchidae, Scarabaeidae; Hymenoptera: Tenthridinidae, Apidae. Trichogrammatidae, Ichneumonidae, Braconidae, Chalcididae; Diptera: Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae,Muscidae, Tephritidae.

Practical

Methods of collection and preservation of insects including immature stages; External features of Grasshopper/Blister beetle; 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.

2.Pests of Crops and Stored Grains and their Management 3(2+1)

Practical

Insect collection and preservation. Identification of important insects. General body organization of insects. Study on morphology of grasshopper or cockroach. Preparation of permanent mounts of mouth parts, antennae, legs and wings. Dissection of grasshopper and caterpillar for study of internal morphology. Observations on metamorphosis of larvae and pupae. Dissection of cockroaches.

Theory

Part – I-

1 Introduction to phylum arthropoda.
2 Importance of class Insecta. Insect dominance.
3 History of entomology in India, Importance of entomology in different fields. Definition, division and scope of entomology.
4 Comparative account of external morphonology-types of mouth parts, antennae, legs, wings and genetalia. -2
5 Structure, function of cuticle & moulting and body segmentation
6 Anatomy of digestive, Circulatory, Sensory, respiratory, glandular, excretory, nervous and reproductive systems. -2
7 Types of reproduction. Postembryonic development-eclosion. Matamorphosis. Types of egg larvae and pupa. -2
8 Classification of insects upto orders, sub-order and families of economic importance and their distinguished characters. Plant mites – morphological features, important families with examples -2

Part-II &III

1 Insect Ecology: Introduction, Environment and its components.
2 Effect of abiotic factors–temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents. Effect of biotic factors – food competition, natural and environmental resistance. -3
3 Categories of pests. Concept of IPM, Practices, scope and limitations of IPM.
4 Classification of insecticides, toxicity of insecticides and formulations of insecticides.
5 Chemical control-importance, hazards and limitations.
6 Recent methods of pest control, repellents, antifeedants, hormones, attractants, gamma radiation. -2
7 Insecticides Act 1968-Important provisions.
8 Application techniques of spray fluids. Symptoms of poisoning, first aid and antidotes. -2

Part – IV

1 Systematics: Taxonomy –importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order. -2
2 Classification of class Insecta upto Orders, basic groups of present day insects with special emphasis to orders and families of Agricultural importance like Orthoptera: Acrididae, Tettigonidae, Gryllidae, Gryllotalpidae; Dictyoptera: Mantidae, Blattidae; Odonata; Isoptera: Termitidae; Thysanoptera: Thripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae, Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidae, Aleurodidae, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera: Pieridae, Papiloinidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidae, Bruchidae, Scarabaeidae; Hymenoptera: Tenthridinidae, Apidae. Trichogrammatidae, Ichneumonidae, Braconidae, Chalcididae; Diptera: Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae,Muscidae, Tephritidae.-10

Practical

1 Insect collection and preservation.
2 Identification of important insects-2
3 General body organization of insects.
4 Study on morphology of grasshopper or cockroach-2.
5 Preparation of permanent mounts of mouth parts, antennae, legs and wings.-2
6 Dissection of grasshopper and caterpillar for study of internal morphology.-2
7 Observations on metamorphosis of larvae and pupae. Dissection of cockroaches-2.

Suggested Reading:

Awasthi, V.B. 1997. *Introduction to general and applied entomology*. Scientific Publishers, Jodhpur, 379 p.

Borror, D.J., C.A. Triple Horn and N.F.Johnson. 1987. *An introduction to the study of insects (VI Edition)*. Harcourt Brace College Publishers, New York, 875p.

Chapman, R.F. 1981. The Insects: Structure and function. Edward Arnold (Publishers) Ltd, London, 919p.

Gullan, P.J. and Cranston, P.S. 2001. *The insects- An outline of entomology*, II edition, Chapman & Hall, Madras, 491p.

Mani, M.S. 1968. *General entomology*. Oxford and IBH Publishing Co. Pvt Ltd., New Delhi, 912p.

Nayar, K.K., T.N.Ananthakrishnan and B.V. David. 1976. *General and applied entomology*, Tata McGraw Hill Publishing Company Limited, New Delhi, 589p.

Richards, O.W. and R.G. Davies. 1977. *Imm's general text book of entomology*, Vol.1&2, Chapman and Hall Publication, London, 1345p.

Romoser, W.S. 1988. *The Science of Entomology*, McMillan, New York, 449p.

Saxena, S.C. 1992. *Biology of insects.* Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 366p.

Srivastava, P.D. and R.P.Singh. 1997. *An introduction to entomology*, Concept Publishing Company, New Delhi, 269p.

Tembhare, D.B. 1997. *Modern Entomology*. Himalaya Publishing House, Mumbai, 623p.

Pedigo, L.P. 1999. *Entomology and pest management*. III Edition. Prentice Hall, New Jersey, USA, 691p.

H. Lewin and Devasahayam. Practical manual of entomology insect and non-insect pests.

Pant, N.C. and Ghai, S. 1981Insect physiology and anatomy, ICAR, New Delhi .

Snodgrass, R.E. 2001.Principles of Insect Morphology.CBS Publishers and Distributors, New Delhi

James, L, Nation. CRC Press, Insect Physiology and Biochemistry.Washington

8. AHPD 5111 Human Values & Ethics (non gradial) 1 (0+1)

Theory

Values and Ethics-An Introduction. Goal and Mission of Life. Vision of Life. Principles and Philosophy. Self Exploration. Self Awareness. Self Satisfaction. Decision Making. Motivation. Sensitivity. Success. Selfless Service. Case Study of Ethical Lives. Positive Spirit. Body, Mind and Soul. Attachment and Detachment. Spirituality Quotient. Examination.

Theory (Periodwise distribution)

1. Values and Ethics-An Introduction.
2. Goal and Mission of Life.
3. Vision of Life.
4. Principles and Philosophy.
5. Self Exploration. Self Awareness.
6. Self Satisfaction.
7. Decision Making.
8. Motivation. Sensitivity. Success. Selfless Service.
9. Case Study of Ethical Lives.
10. Positive Spirit. Body, Mind and Soul.
11. Attachment and Detachment.
12. Spirituality Quotient. Examination.

9. APEY 5111 NSS/NCC/Physical Education & Yoga Practices 2 (0+2)

Theory (Periodwise distribution)

Course aims at evoking social consciousness among students through various activities viz., working together, constructive and creative social work, to be skilful in executing democratic leadership, developing skill in programme development to be able for self employment, reducing gap between educated and uneducated, increasing awareness and desire to help sections of society.

Following activities are to be taken up under the NSS course:

- Introduction and basic components of NSS: Orientation
- NSS programmes and activities
- Understanding youth
- Community mobilisation
- Social harmony and national integration
- Volunteerism and shramdan
- Citizenship, constitution and human rights
- Family and society
- Importance and role of youth leadership
- Life competencies
- Youth development programmes
- Health, hygiene and sanitation
- Youth health, lifestyle, HIV AIDS and first aid
- Youth and yoga
- Vocational skill development
- Issues related environment
- Disaster management
- Entrepreneurship development
- Formulation of production oriented project
- Documentation and data reporting
- Resource mobilization
- Additional life skills
- Activities directed by the Central and State Government

All the activities related to the National Service Scheme course is distributed under four different courses viz., National Service Scheme I, National Service Scheme II, National Service Scheme III and National Service Scheme IV each having one credit load. The entire four courses should be offered continuously for two years. A student enrolled in NSS course should put in at least 60 hours of social work in different activities in a semester other than five regular one day camp in a year and one special camp for duration of 7 days at any semester break period in the two year. Different activities will include orientation lectures and practical works. Activities directed by the Central and State Government have to be performed by all the volunteers of NSS as per direction.

Course Title: National Service Scheme I

Introduction and basic components of NSS:

Orientation: history, objectives, principles, symbol, badge; regular programmes under NSS, organizational structure of NSS, code of conduct for NSS volunteers, points to be considered by NSS volunteers awareness about health

NSS programmes and activities

Concept of regular activities, special camping, day camps, basis of adoption of village/slums, conducting survey, analysing guiding financial patterns of scheme, youth programme/ schemes of GOI, coordination with different agencies and maintenance of diary

Understanding youth

Definition, profile, profile, categories, issues and challenges of youth; and opportunities for youth who is agent of the social change

Community mobilisation

Mapping of community stakeholders, designing the message as per problems and their culture; identifying methods of mobilisation involving youth-adult partnership

Social harmony and national integration

Indian history and culture, role of youth in nation building, conflict resolution and peace-building

Volunteerism and shramdan

Indian tradition of volunteerism, its need, importance, motivation and constraints; shramdan as part of volunteerism

Citizenship, constitution and human rights

Basic features of constitution of India, fundamental rights and duties, human rights, consumer awareness and rights and rights to information

Family and society

Concept of family, community (PRIs and other community based organisations) and society

Physical Education and Yoga Practices Credit hours: 2 (0+2) (0+2)

1. Teaching of skills of Football – demonstration, practice of the skills, correction, involvement in game situation (For girls teaching of Tennikoit)
2. Teaching of different skills of Football – demonstration, practice of the skills, correction, involvement in game situation (For girls teaching of Tennikoit)
3. Teaching of advance skills of Football – involvement of all the skills in game situation with teaching of rules of the game
4. Teaching of skills of Basketball – demonstration, practice of the skills, correction of skills, involvement in game situation
5. Teaching of skills of Basketball – demonstration, practice of the skills, involvement in game situation
6. Teaching of skills of Basketball – involvement of all the skills in game situation with teaching of rule of the game
7. Teaching of skills of Kabaddi – demonstration, practice of the skills, correction of skills, involvement in game situation
8. Teaching of skills of Kabaddi – demonstration, practice of the skills, correction of skills, involvement in game situation
9. Teaching of advance skills of Kabaddi – involvement of all the skills in game situation with teaching of rule of the game
10. Teaching of skills of Ball Badminton – demonstration, practice of the skills, correction of skills, involvement in game situation
11. Teaching of skills of Ball Badminton – involvement of all the skills in game situation with teaching of rule of the game
12. Teaching of some of Asanas – demonstration, practice, correction and practice
13. Teaching of some more of Asanas – demonstration, practice, correction and practice
14. Teaching of skills of Table Tennis – demonstration, practice of skills, correction and practice and involvement in game situation
15. Teaching of skills of Table Tennis – demonstration, practice of skills, correction and practice and involvement in game situation

List of courses for 1st Year 1st Semester approved in 106th Academic Council Meeting held on 15th July 2016 and effective from academic session 2016-17 First Year First Semester

16. Teaching of skills of Table Tennis – involvement of all the skills in game situation with teaching of rule of the game
17. Teaching – Meaning, Scope and importance of Physical Education
18. Teaching – Definition, Type of Tournaments
19. Teaching – Physical Fitness and Health Education
20. Construction and laying out of the track and field (*The girls will have Tennikoit and Throw Ball).