

AGR 101 Fundamentals of Agronomy and Agricultural Heritage (1+1)

Unit - I:

Agriculture - Definition - Importance and scope - Branches of agriculture - Evolution of man and agriculture - History of agricultural development in the World and India.

Unit - II:

Agriculture heritage - Agriculture in ancient India - Chronological agricultural technology development in India - **Kambar Aer Ezhupathu** - Development of scientific Agriculture - National and International Agricultural Research Institutes in India - Indian agriculture.

Unit - III:

Agronomy - Definition - Importance - Meaning and scope - **Agro-climatic zones of Tamil Nadu - Agro ecological zones of India - Crops and their classification - Economic and agronomic - Major crops of India and Tamil Nadu - Major soils of Tamil Nadu - Factors affecting crop production - climatic - edaphic - biotic - physiographic and socio economic factors.**

Unit - IV:

Tillage - Definition - Types - Objectives - Modern concepts of tillage - Main field preparations - Seeds - seed rate - sowing methods - Crop establishment methods - Planting geometry and its effect on growth and yield - After cultivation - Thinning - Gap filling - Weeds - Definition - Weed control methods.

Unit - V:

Manures and fertilizers (organic, in-organic, green manure) - time and method of application - Irrigation - Principles and concepts - Cropping patterns and cropping systems - Sustainable agriculture - integrated farming systems - Organic agriculture - Principles and concepts - Dry farming - Principles and concepts.

Practical:

Visit to college farm - Study of farm features and measurements - identification of crops and seeds - working out seed rate - Study of seed treatment practices - Study of tillage implements; practicing ploughing, puddling operations, practicing seeding different methods of sowing and planting - Study and practicing inter-cultivation implements; Practicing fertilizer applications - Participation in ongoing field operations.

Theory - Lecture Schedule:

1. Agriculture - Definition - Importance and scope - Branches of agriculture - Evolution of man and agriculture.
2. Indian agriculture - Indian economy - National income - per capita income - Agricultural income in GDP - Women in agriculture and empowerment.
3. Agriculture heritage - Agriculture in ancient India.
4. Chronological agricultural technology development in India. – Kambar Aer Ezhupadhu
5. Development of scientific agriculture - National and International Agricultural Research Institutes
6. Agronomy - definition - meaning and scope
7. Agro-climatic zones of India and Tamil Nadu - Agro ecological zones of India and Tamil Nadu.
8. **Mid-semester Examination.**
9. Crops and major soils - classification - Economic and agricultural importance in Tamil Nadu and India.
10. Factors affecting crop production - climatic - edaphic - biotic- physiographic and socio economic factors.
11. Tillage - Definition - objectives - types of tillage - modern concepts of tillage - main field preparation.
12. Seeds - Seed rate - sowing methods - Germination - Crop stand establishment - Planting geometry.
13. Weeds - Definition - harmful and beneficial effects of weeds - crop weed competition and management of weeds - IWM.
14. Role of manures and fertilizers in crop production - Inter cultivation - Thinning - gap filling and other intercultural operations.
15. Irrigation - time and methods - Modern techniques of irrigation - Drainage and its importance.
16. Cropping patterns and cropping system - intensive cropping - sustainable agriculture – IFS.
17. Organic / eco - friendly agriculture - Dry farming- principles and concepts.

Practical schedule:

1. Visit to college farm to observe wetland farming system and identification of crops.
2. Visit to college farm to observe garden land and dry land farming systems and identification of crops.
3. Identification of seeds, manures, fertilizers, green manures and green leaf manures.
4. Identification of tools and implements.
5. Acquiring skill in handling primary and secondary tillage implements.
6. Practicing different methods of land configuration for raising nursery for wet land crops.
7. Practicing different methods of land configuration for raising nursery for garden land crops.
8. Practicing different methods of seed treatments, methods of sowing and seeding implements.
9. Working out seed rates and practicing thinning, gap filling operations for optimum crop stand and intercultural operations.
10. Working out manure and fertilizer requirement of crops.
11. Practicing methods of application: manures and fertilizers and incorporation of green manure and green leaf manure.

12. Identification of weeds, weeding practices and handling of weeding tools and implements.
13. Observing various irrigation methods.
14. Practicing harvesting operations in major field crops.
15. Participation in on-going field operations during on campus / off campus visit.
16. Visit to nearby Agricultural Research station.
17. **Practical Examination.**

References:

Yellamananda Reddy, T. and G.H. Sankara Reddi. 1997. Principles of Agronomy. Kalyani Publishers, New Delhi.

Sankaran, S. and V.T. Subbiah Mudaliar. 1997. Principles of Agronomy. The Bangalore Printing and Publishing Co. Ltd., Bangalore.

ICAR. 2011. Handbook of Agriculture. Indian Council of Agricultural Research, New Delhi.

E-References:

<http://icar.res.in>

www.webcast.gov.in

www.icar.org.in/nasm.html

BIC 101 FUNDAMENTALS OF BIOCHEMISTRY (2+1)

Theory

UNIT I Carbohydrates

Carbohydrates - occurrence and classification. Structure of monosaccharides, oligosaccharides and polysaccharides. Physical and chemical properties of carbohydrates - optical isomerism, optical activity, mutarotation, reducing property, reaction with acids and alkalis. Glycoconjugates - Glycoproteins and Lectin - structure and significance.

UNIT II Lipids

Lipids - occurrence and classification. Storage lipids - fatty acids, triacyl glycerol, essential fatty acids, waxes. Structural lipids - role of lipids in biological membrane-glycolipids and phospholipids - types and importance; Sterols - basic structure and their importance. Physical and chemical constants of oils. Rancidity of oils.

UNIT III Proteins , Enzymes and Nucleic acids

Amino acids - classification and structure. Essential amino acids. Properties of amino acids - amphoteric nature and isomerism. Classification of proteins based on functions and solubility. Structure of proteins: primary structure, secondary structure, tertiary structure and quaternary structure - protein folding and denaturation. Properties and reactions of proteins. Enzymes - Properties, classification and nomenclature. Mechanism of enzyme action. Factors affecting enzyme activity. Enzyme inhibition - Competitive, Non-competitive and Uncompetitive inhibition; Allosteric enzymes. Coenzymes, cofactors and isoenzyme.

Nucleic acids: Importance and classification; Structure of Nucleotides, A, B & Z DNA; RNA: Types and Secondary & Tertiary structure.

UNIT IV Metabolism

Carbohydrate metabolism - breakdown of starch by amylases, glycolysis, TCA cycle and pentose phosphate pathway. Respiration - electron transport chain and oxidative phosphorylation. Bioenergetics of glucose. Lipid metabolism - lipases and phospholipases. Beta-oxidation of fatty acids and bioenergetics. Biosynthesis of fatty acids and triacyl glycerol. General catabolic pathway for amino acids - transamination, deamination and decarboxylation. Ammonia assimilating enzymes. Metabolic inter-relationship.

UNIT V Secondary metabolites

Secondary metabolites - occurrence, classification and functions of phenolics, terpenes and alkaloids.

Practical

Qualitative analysis of carbohydrates, Estimation of starch, amylase. Determination of reducing sugars. Qualitative analysis of amino acids, Sorenson's formal titration of amino acids, Estimation of amino acids, Estimation of protein .Determination of free fatty acid, iodine number of oil. Estimation of ascorbic acid by dye method. Assay of amylase. Estimation of total phenols. Extraction and estimation of lycopene and carotenoids. Separation of amino acids by paper chromatography, Separation of phenols by thin layer chromatography.

Lecture Schedule

1. Introduction to Biochemistry, Carbohydrates - occurrence and classification T2: 1-4, 66-72
2. Structure of monosaccharides T2: 75-82
3. Structure of oligosaccharides and polysaccharides T2: 82-90
4. Physical and Chemical properties of carbohydrates T2: 73-78, T2: 90-95
5. Glycoproteins and lectin - structure and significance T1: 316-321
6. Lipids - occurrence and classification T2: 99-100
7. Storage lipids - Fatty acids and triacyl glycerol; Essential fatty acids, waxes T2: 101-106
8. Structural lipids - Glycolipids and phospholipids - types and importance T2: 107-111
9. Sterols - basic structure and their importance T2: 111-114
10. Physical and chemical constants of oils; Rancidity of oils T2: 114-119
11. Amino acids - Classification and structure T2: 17-21
12. Properties of amino acids - amphoteric nature, isomerism, essential amino acids T2: 21-26
13. Classification of proteins based on function and solubility T2: 26-31
14. Structure of protein - Primary, secondary, tertiary and quaternary structure T2: 31-41
15. Protein folding, physical and chemical properties of proteins T2: 41-43, T1: 52-55
16. Enzymes - Properties, classification and nomenclature T2: 123-127
17. **MIDSEMESTER EXAMINATION**
18. Mechanism of enzyme action T2: 129-131

19. Factors affecting enzyme activity T2: 131-136
20. Enzyme inhibition - competitive, non-competitive, uncompetitive and allosteric enzymes
T2: 136-137, T1: 224-225
21. Coenzymes, cofactors and isoenzyme T2: 127-129, 138
22. **Nucleic acids: Importance and classification; Structure of Nucleotides, A, B & Z DNA** T2 :47-56
23. **RNA: Types and Secondary & Tertiary structure** T2:57-63
24. Carbohydrate metabolism - breakdown of starch by amylases, Glycolysis - Reactions and bioenergetics T2:159-164
25. TCA cycle - Reactions and bioenergetics T2: 164-168
26. Pentose phosphate pathway - Reactions T2: 174-177
27. Respiration - electron transport chain and oxidative phosphorylation T2: 170-173
28. Lipid metabolism - lipases and phospholipases, Beta-oxidation of fatty acids and bioenergetics T2: 205-208, T2: 208-212
29. Biosynthesis of fattyacids and triacylglycerol T2: 213- 220
30. Transamination, deamination and decarboxylation of amino acids T2: 224-231
31. Ammonia assimilating enzymes - GS, GOGAT and GDH T2: 231-233
32. Metabolic inter-relationship T2: 287-289
33. Secondary metabolites - occurrence, classification and functions of phenolics T2: 274-276
34. Occurrence, classification and functions of terpenes and alkaloids T2: 277-280

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<http://agropedia.iitk.ac.in/>

<http://agritech.tnau.ac.in>

SAC 101 Fundamentals of Soil Science (2+1)

Aim:

To impart knowledge about soils, their formation, pedological and edaphological approaches and physical, chemical and biological properties of soils.

Unit I

Soil as a natural body, Pedological and edaphological concepts of soil. Components of soil. Soil genesis: Composition of Earth's crust- soil forming rocks and minerals – Primary and secondary minerals. Weathering of rocks and minerals. Factors of soil formation. Soil forming processes. Soil Profile.

Unit II

Soil physical properties: Soil texture, structure, density and porosity, soil colour, consistence and plasticity. Soil water retention, movement and availability. Soil air, composition, gaseous exchange-problem and its effect on crop growth. Source, amount and flow of heat in soil, Soil temperature and crop growth.

Unit III

Soil physico chemical and chemical properties: Soil reaction-pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability. Electrical conductivity. Soil colloids - inorganic and organic. Silicate clays: constitution and properties, sources of charge, ion exchange, cation and anion exchange capacity and base saturation.

Unit IV

Soil organic matter: composition, properties and its influence on soil properties. Humic substances - nature and properties. Soil Biology : Soil organisms : macro and micro organisms, their beneficial and harmful effects. Soil enzymes. Soil pollution – Types and behaviour of pesticides. Inorganic contaminants. Prevention and mitigation of soil pollution.

PRACTICAL SCHEDULE

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

Lecture Schedule

	Soil definition - Soil as a three dimensional natural body, Pedological and edaphological concepts of soil
2	Components of soil – soil a three phase system- Composition of Earth's crust.
3	Soil genesis: soil forming rocks-definition, formation, Classification of rocks- igneous, sedimentary and metamorphic rocks
4.	Brief description of important rocks - mineralogical composition
5	Minerals- definition, occurrence, classification of important soil forming primary minerals - silicate and non silicate minerals, ferro and non-ferro magnesium minerals
6	Formation of secondary minerals - clay minerals and amorphous minerals
7	Weathering - Rocks and minerals - Physical, chemical and biological weathering
8	Factors of soil formation- Passive and active soil forming factors soil forming factors
9	Soil forming process- Fundamental - Simenson's four fold soil forming process - eluviation, illuviation, translocation and humification
10	Specific Soil forming processes - podzolization, laterization, salinization, alkalization, calcification, decalcification and pedoturbation
11	Soil Profile – Horizons, Master horizons and subordinate horizons, subdivisions, Lithological discontinuity.
12	Soil physical properties: Soil texture - particle size distribution - textural classes - textural triangular diagram - significance of soil texture
13	Soil structure - classification - genesis - factors influencing structural stability - significance of soil structure
14	Soil bulk density, particle density and porosity - factors influencing – significance.
15	Soil colour - causes and measurement - Munsell colour chart - factors influencing soil colour –Significance of soil colour.
16	Soil consistence - cohesion, adhesion, plasticity, Atterberg's constants - upper and lower plastic limits, plasticity number- significance of soil consistence
17	Mid semester Examination
18	Soil water- forms of water, units of expression and pF scale
19	Soil water potentials - gravitational, matric, osmotic- Soil moisture constants and Soil moisture measurements.
20	Movement of soil water - Saturated and unsaturated flow - infiltration, hydraulic conductivity, percolation, permeability and drainage

21	Soil air, composition, gaseous exchange – Problem and its effect on crop growth.
22	Source, amount and flow of heat in soil, soil temperature and crop growth. and crop growth.
23	Soil reaction (pH) - definition, pH scale, soil acidity and alkalinity, buffering, effect of pH on nutrient availability and factors affecting soil pH
24	Soil Electrical Conductivity - Factors affecting EC – its significance
25	Soil colloids - inorganic and organic
26	Silicate clays: constitution and classification - 1:1, 2:1 expanding and non expanding - 2:2 clay minerals, amorphous minerals and their properties
27	Sources of charge, ion exchange – positive and negative charge – isomorphous substitution, pH dependant charge.
28	Ion exchange - Cation and anion exchange capacity and base saturation
29	Soil organic matter: composition, properties and its influence on soil properties
30	Humic substances – fractionation, nature and properties, Theories of humus formation.
31	Soil Biology- Soil organisms: macro and micro organisms, their beneficial and harmful effects, Soil enzymes
32	Soil carbon sequestration and carbon trading
33	Soil pollution - behaviour of pesticides and inorganic contaminants
34	Prevention and mitigation of soil pollution

Practical schedule

- 1 Study of soil sampling tools, collection of representative soil sample, its processing and storage.
2. Study of soil profile in field.
- 3 Study of soil forming rocks and minerals.
- 4 Determination of soil density and porosity.
- 5 Determination of soil colour and moisture content and porosity.
- 6 Determination of soil texture by feel and Bouyoucos Methods
- 7 Determination of soil texture by International pipette method.
- 8 Studies of capillary rise phenomenon of water in soil column and water movement in soil (Infiltration Rate)
- 9 Studies of capillary rise phenomenon of water in soil column and water movement in soil (Hydraulic conductivity)
- 10 Determination of soil temperature and demonstration of heat transfer.
- 11 Preparation and standardization of laboratory reagents, indicators and buffers
- 12 Determination of soil pH and electrical conductivity.
- 13 Determination of cation exchange capacity of soil - I.
- 14 Determination of cation exchange capacity of soil - II
- 15 Estimation of soil organic carbon.
- 16 Study of soil map (India and Tamil Nadu)
- 17 **Practical Examination**

Text Books

1. Brady, N.C. and Raymond, C.Weil. 2013. The Nature and Properties of Soils (14th Edition). Pearson Education, Inc. Publishing as Prentice Hall.
2. Fundamentals of Soil Science. 2009. ISSS Publication, New Delhi.
3. Sehgal, J. 2005. Pedology concepts and applications, Kalyani Publishers, New Delhi.
4. Das, D.K. 2013. Introductory Soil science, Kalyani Publishers, New Delhi.

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1. <http://www.sciencedirect.com/science/books>
2. <http://202.200.144.17/sykc/hjx/content/ckzl/6/2.pdf>
3. http://www.pedosphere.com/volume01/pdf/Section._01.pdf
4. [http://waterquality.montana.edu/docs/homeowners/Septic Drain field Soil Suitability, Presentations /6 _Soil Texture and__Structure.pdf](http://waterquality.montana.edu/docs/homeowners/Septic%20Drain%20field%20Soil%20Suitability,%20Presentations%206%20_Soil%20Texture%20and%20_Structure.pdf)
5. http://wfrec.ifas.ufl.edu/landscape_horticulture/PDFdocuments/SoilProp.pdf
6. [http://www.rootsofpeace.org/assets/Soil%Testingq%Manual%20V6%20\(Feb%208\).pdf](http://www.rootsofpeace.org/assets/Soil%20Testing%20Manual%20V6%20(Feb%202008).pdf)
7. <http://www.soils.wisc.edu/courses/SS325/morphology.htm>
8. <http://www.soils.wis.edu/courses/SS325/morphology.htm>
9. <http://landresources.montana.edu/>
10. [http://ftp.wcc.nrcs.usda.gov/H....soil Other/soil-USDA-textural-class.pdf](http://ftp.wcc.nrcs.usda.gov/H...soil%20Other/soil-USDA-textural-class.pdf)

Out Come

The students will gain knowledge on concepts and principles of analytical techniques. They will also acquire skills in various analytical techniques. Further, the knowledge gained will form as building block to pursue many research works.

FOR 111 Introduction to Forestry (1+1)

Theory

Definition of Forest and Forestry, importance, History, Forestry Education and Research in India, various branches in forestry. National Forest Policy of 1894, 1952, 1988: Indian Forest Act-1927: Karnataka Tree Preservation Act: Forest Conservation Act-1980: The Environment (Protection) Act-1986: Indian Wildlife Preservation Act-1972: Amendments to Environment (Protection) Act-1999. Forest wealth in India: Forest productivity. Deforestation: Various causes and implications, desertification, afforestation, reforestation. Indian wildlife and management. National parks and sanctuaries, endangered species; Forest ecosystem, natural forests and their formation, succession and zonation, limiting factors: climax vegetation, types of natural forests and their distribution. Food chain, natural forests, V/s man-made forest. Social forestry and its branches: Extension forestry, urban forestry, recreation forestry. Farm-forestry: Agro-forestry methods, woodlot system etc., and their management, windbreaks and shelterbelts: different types of waste lands and their reclamation through afforestation and joint forest management.

Practical

Identification of important trees, seeds and seedlings: Study of nursery techniques-Trench and mound plantation, pit plantation: Study of different types of plantations: Visit to agro-forestry and farm forestry plots: Measurement of volume of standing trees: Study of wood formation: study of wood specimens and non-timber forest products. Visit to a nearby National Park and forest.

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.

ENG 101 - Comprehension and Communication Skills in English (Gradiual course)

Credit hours: 2(1+1)

Theory

War Minus Shooting- The sporting Spirit. A Dilemma- A layman looks at science Raymond B. Fosdick. You and Your English – Spoken English and broken English G.B. Shaw. Reading Comprehension, Vocabulary- Antonym, Synonym, Homophones, Homonyms, often confused words. Exercises to Help the students in the enrichment of vocabulary based on TOEFL and other competitive examinations. Functional grammar: Articles, Prepositions, Verb, Subject verb Agreement, Transformation, Synthesis, Direct and Indirect Narration. Written Skills: Paragraph writing, Precise writing, Report writing and Proposal writing. The Style: Importance of professional writing. Preparation of Curriculum Vitae and Job applications. Synopsis Writing. Interviews: kinds, Importance and process.

Practical

Listening Comprehension: Listening to short talks lectures, speeches (scientific, commercial and general in nature). Oral Communication: Phonetics, stress and intonation, Conversation practice. Conversation: rate of speech, clarity of voice, speaking and Listening, politeness & Reading skills: reading dialogues, rapid reading, intensive reading, improving reading skills. Mock Interviews: testing initiative, team spirit, leadership, intellectual ability. Group Discussions.

Syllabus

ENG 101 - Comprehension and Communication Skills in English (1+1)

THEORY LECTURE SCHEDULE

1. **War Minus Shooting** (A lesson from the Text Book, “The Sporting Spirit” by George Orwell) textual grammar pertaining to factual comprehension and inferential comprehension & referential comprehension.
2. **War Minus Shooting** (A lesson from the Text Book, “The Sporting Spirit” by George Orwell) textual grammar pertaining to global comprehension and attitudinal comprehension
3. **War Minus Shooting** (A lesson from the Text Book, “The Sporting Spirit” by George Orwell) textual grammar on synonyms – antonyms – prefix – suffix – homonyms - homophones – TOEFL & IELTS vocabulary
4. **War Minus Shooting** (A lesson from the Text Book, “The Sporting Spirit” by George Orwell) textual grammar – English articles – preposition – conjunctions and its types
5. **A Dilemma** (A lesson from the Text Book, Layman looks at Science by Raymond Fosdick) textual grammar – verbs – auxiliary verbs - modals and basic tense forms
6. **A Dilemma** (A lesson from the Text Book, Layman looks at Science by Raymond Fosdick) textual grammar – sentence pattern and sentence forms (simple, compound and complex sentences)

7. **A Dilemma** (A lesson from the Text Book, Layman looks at Science by Raymond Fosdick) textural grammar – subject – verb – agreement

8. **A Dilemma** (A lesson from the Text Book, Layman looks at Science by Raymond Fosdick) textural grammar – transformation of sentences

9. **MID-SEMESTER EXAMINATION**

10. **You and Your English** (A lesson from the Text Book, Spoken English and Broken English by G.B. Shaw) textural grammar – synthesis of sentences – reported speech (direct and indirect speech)

11. **You and Your English** (A lesson from the Text Book, Spoken English and Broken English by G.B. Shaw) textural grammar – paragraph writing (thesis sentences, supporting statements, inferential statements)

12. **You and Your English** (A lesson from the Text Book, Spoken English and Broken English by G.B. Shaw) textural grammar – four principles of writing

13. **You and Your English** (A lesson from the Text Book, Spoken English and Broken English by G.B. Shaw) textural grammar - professional writing – summary writing and paraphrasing, synopsis writing and citation

14. Graham's flow chart on writing skills

15. Letter writing – personal and social correspondence – job application

16. precise writing – report writing and proposal writing

17. Interview skills - kinds – importance and process

Syllabus

ENG 101 - Comprehension and Communication Skills in English (1+1)

PRACTICAL SCHEDULE

1. Listening - Introduction - Listening vs Hearing - listening modes - types of listening -
Intensive and Extensive Listening – practice
2. Process of Listening - methods of enhancing listening - barriers to listening and ways to overcome them – practice
3. Oral communication - organs of speech – English phonemes (consonant table, vowel table) - practice
4. English Stress & Intonation - exercises.
5. Conversation techniques and practice
6. Rate of speech (slow pace, medium pace, rhetoric)
7. Reading - types - skimming and scanning - SQ4R - critical reading - analytical reading – exercises
8. Principles and practice of presentation skills - PowerPoint preparation and presentation
9. Handout preparation - lecture notes preparation - practice and evaluation
10. Writing skills - note taking – precise writing – abstract writing – practice
11. Mind-mapping and article writing
12. Letter writing and rejoinder writing
13. Text writing - practice on table to text conversion
14. Interview skills – types of interview (group interview – panel interview – telephone interview – behavioural interview – video-conferencing interview – mock interview)
15. Practice on speaking skills – welcome address - vote of thanks - short extemporal speech
16. Group discussion – techniques – types and practice
17. **PRACTICAL EXAMINATION**

References

1. Goodale, Malcolm, *Professional Presentations*, Cambridge University, 2005.
2. Greenbaum Sidney, *Oxford English Grammar*, New Delhi, Oxford University Press. Peregoy, 2009.
3. Jones Daniel, *English Pronouncing Dictionary*, Cambridge University Press, 2006.
4. Lynch, Tony and Kenneth Anderson, *Study Speaking*, Cambridge University, 1992.
5. Martin Cutts, *Oxford Guide to Plain English*, Oxford University Press, 2004.
6. Sahaneya Wandy, et.al., *IELTS, Preparation and Practice*, Oxford University, 2005.
7. Sundararajan, N, *Attentive Listening: How it Matters*, University News, March 19-25, 2005.

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www.essays.com	www.writing-skills.com
www.onestopenenglish.com	www.negotiation.com
www.bogglesworld.com	www.teachersdesk.com
www.eltweb.com	www.flexbilelearning.net.an

HOR 111 Fundamentals of Horticulture (1+1)

AIM

- To inculcate the basic concepts, technical knowhow of horticultural operations.

Unit I History, evolution and scope of horticulture

Origin of horticulture – history – evolution – definitions – scope and importance of horticulture – division and classification of horticultural crops – fruits, vegetables, spices and plantation crops, floriculture, landscaping, ornamental gardening, medicinal and aromatic crops – nutritive value and global and national scenario of horticultural crops.

Unit II Sexual propagation

Sexual propagation – importance, advantages and disadvantages – methods of enhancement of seed viability – types of dormancy – seed invigoration – seed treatments

Unit III Asexual propagation

Asexual propagation, importance, advantages and disadvantages - Asexual propagation types *viz.*, Types of cutting, layering, grafting and budding. Use of specialized plant parts in propagation. Propagation structures and their role. Rootstock influence – stock / scion relationship in fruit crops. Scope and importance of micro propagation in horticultural crops. Direct and indirect organogenesis – media for micro propagation and hardening.

Unit IV Planting systems and pollination

Principles of orchard establishment - Methods of planting systems including HDP and UHDP in horticultural crops – crop regulatory practices for horticultural crops – training, pruning, special operations in horticultural crops – off season production of horticultural crops. Flowering, pollination, fruit set, fruit drop, parthenocarpy, fruit ripening and senescence – Unfruitfulness and its causes.

Unit V. Principles and types of garden

Principles and types of garden – principles and types of parks – principles of herbal garden

Practical

Features of an orchard - Identification of garden tools, implements and machineries. Identification of horticultural crops and herbarium making. Preparation of potting mixture, potting and repotting. Preparation of seed bed / nursery bed. Practice of sexual and asexual methods of propagation- cutting, layering, budding, grafting – specialized plant parts - Layout and planting of fruit trees. Training and pruning of fruit trees. Transplanting and care of vegetable seedlings. Making of herbaceous and shrubby borders. Practicing irrigation, fertilizer and manures application in different crops. Preparation and application of Plant Growth Regulators – visit to tissue culture lab - Visits to commercial nurseries / orchard / garden.

Theory schedule

1. Origin of horticulture – history – evolution – definitions – scope and importance of horticulture
2. Division and classification of horticultural crops – fruits, vegetables, spices and plantation crops, floriculture, landscaping, ornamental gardening, medicinal and aromatic crops
3. Nutritive value and global and national scenario of horticultural crops
4. Sexual propagation – importance, advantages and disadvantages – methods of enhancement of seed viability
5. Types of dormancy – seed invigoration – seed treatments
6. Asexual propagation, importance, advantages and disadvantages - Asexual propagation types
7. Vegetative propagation – merits and demerits – cutting and layering
8. Vegetative propagation – merits and demerits – grafting and budding

9. Mid semester examination

10. Use of specialized plant parts in propagation - Propagation structures and their role.
11. Rootstock influence – stock / scion relationship in fruit crops
12. Scope and importance of micro propagation in horticultural crops- Direct and indirect organogenesis – media for micro propagation and hardening
13. Principles of orchard establishment - Methods of planting systems including HDP and UHDP in horticultural crops
14. Crop regulatory practices for horticultural crops – training, pruning, special operations in horticultural crops – off season production of horticultural crops.
15. Flowering, pollination, fruit set, fruit drop, parthenocarpy, fruit ripening and senescence, unfruitfulness and its causes
16. Principles and types of garden –
17. Principles and types of parks – principles of herbal garden

Practical schedule

1. Visit to orchard and identifying its components
2. Identification of garden tools, implements and machineries
3. Identification of horticultural crops and herbarium making
 4. Preparation of pot mixture, potting and repotting
 5. Preparation of nursery beds for raising rootstocks and seedlings
6. Practicing asexual methods of propagation- cutting and layering
7. Practicing asexual methods of propagation – budding and grafting
8. Plant propagation structures and specialized plant parts for propagation
9. Layout and planting of fruit trees
10. Training and pruning of fruit trees
11. Transplanting and care of vegetable seedlings
12. Making of herbaceous and shrubby borders
13. Practicing irrigation, fertilizer and manures application in different crops
14. Preparation and application of Plant Growth Regulators
15. Visit to tissue culture lab
16. Visit to commercial nurseries / garden

17. Practical examination

References

Text books

1. Sadhu, M.K. 1989. Plant Propagation. Wiley Eastern Ltd., 4835/24, Ansari Road, Daryaganj, New Delhi- 110 002. Bose, T.K., S.K. Mitra, M. K. Sadhu and B. Mitra. 1991. Propagation of Tropical and Subtropical Horticultural Crops. Naya Prakash 206, Bidhan Sarani, Calcutta-6, India. Hartmann, H.T., D.E. Kester, F.T. Davies and R.L. Greeneve. 1997. Plant Propagation - Principles and Practices. Prentice Hall of India Private Ltd., New Delhi. Nanda, K.K and V.K. Kochhar. 1995. Vegetative Propagation of Plants. Kalyani Publishers, Ludhiana.
2. George Acquaah, 2002. Horticulture – principles and practices. Prentice Hall of India Pvt. Ltd., New Delhi.
3. Hartman, H.T. and Kester, D.E. 1986. Plant propagation – Principles and Practices – Prentice Hall of India Ltd., New Delhi.
4. Jules Janick. 1979. Horticultural Science. Surjeet Publications. New Delhi.
5. Kumar, N. 2014, Introduction to Horticulture, Oxford IBH Publications, New Delhi.

III. Journals

1. Indian Horticulture
2. Chronica Horticulture
3. Hort technology

IV. e references

- [http://aggie](http://aggie.tamu.edu/propagation/propagation.html) – horticulture, tamu.edu/propagation/propagation.html
- <http://www.britannica.com/>
- <http://www.horticulture.com.au/export/hmac.asp>
- <http://www.horticultureworld.net/hort-india.htm>
- <http://www.fao.org/>

Outcome

The students will know about the history, principles, basic concepts and technical knowhow of the horticultural operations

Objective:

To understand and apply fundamental concepts of mathematics applicable in biology and to acquire about theoretical concepts of Algebra, Geometry, Calculus and Mathematical Modeling.

TheoryUnit - I

Algebra: Permutation and Combination -meaning of nPr and nCr (simple problems). Matrices- Definition of Matrices, Addition, Subtraction, Multiplication, Transpose and Inverse up to 3^{rd} order by adjoint method, Properties of determinants up to 3^{rd} order and their evaluation.

Unit - II

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

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

Unit - III

Differential Calculus: Definition of function, limit and continuity, Simple problems on limit, Simple problems on continuity, Differentiation of x^n , e^x , $\sin x$ & $\cos x$ from first principle, Derivatives of sum, difference, product and quotient of two functions, Differentiation of functions of functions (Simple problem based on it), Logarithmic differentiation (Simple problem based on it), Differentiation by substitution method and simple problems based on it, Differentiation of Inverse Trigonometric functions. Partial differentiation with first and second order -Maxima and Minima of the functions of the form $y = f(x)$ and $y = f(x_1, x_2)$ (Simple problems based on it).

Unit -IV

Integral Calculus: Integration of simple functions, Integration of Product of two functions, Integration by substitution method, Definite Integral (simple problems based on it), Area under simple well-known curves (simple problems based on it).

Unit-V

Mathematical Models: Agricultural systems - Mathematical models - classification of mathematical models- Fitting of Linear, quadratic and exponential models to experimental data.

Practical

Simple problems in Permutation and Combination -meaning of nPr and nCr
Problems in Algebra of matrices , Transpose and Inverse up to 3^{rd} order by adjoint method, evaluation of determinants up to 3^{rd} order. Problems in Straight lines using distance formula, section formula (internal and external division), Change of axes (only origin changed)- Equation of co-ordinate axes- Equation of lines parallel to axes. Problems in equation of a line in : Slope-intercept form, Slope-point form, two point forms, Intercept form, Normal form , General form, Point of intersection of two straight lines. Problems in Angles between two straight lines, Parallel lines, Perpendicular lines. Problems in 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) . Simple problems in limit and continuity. Problems in differentiation of x^n , e^x , $\sin x$ & $\cos x$, derivatives of sum, difference, product and quotient of two functions. Simple problem based on differentiation of functions of functions and Logarithmic differentiation. Simple problems based on differentiation by substitution method. Problems in partial differentiation and Maxima and Minima of the functions of the form $y=f(x)$ and $y=f(x_1, x_2)$. Problems in integration of simple functions and product of two functions- Definite Integral. Integration by substitution method-Problems in Area under simple well-known curves. Problems in fitting linear, quadratic and Exponential models to experimental data.

Theory Schedule:

1. Permutation and Combination -meaning of nPr and nCr (Simple Problems) .
2. Matrices- Definition of Matrices- Types of Matrices- Addition, Subtraction, Multiplication, Transpose
3. Determinants-Properties of determinants -up to 3^{rd} order evaluation and inverse up to 3^{rd} order by adjoint method.
4. Straight lines - Distance formula-section formula (internal and external division) - Change of axes (only origin changed) - Equation of co-ordinate axes- Equation of lines parallel to axes.
5. Forms of equation of Line-Slope-intercept form -Slope one point form - Two point form -Intercept form.
6. Normal form of equation of line- General form of equation of line- Point of intersection of two straight lines.
7. Angles between two straight lines- Parallel lines- Perpendicular lines- Angle of bisectors between two lines.
8. 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) .
9. **Mid Semester Examination**
10. Differential Calculus - Definition of function, limit and continuity- Simple problems on limit and continuity.

11. Differentiation of x^n , e^x , $\sin x$ & $\cos x$ from first principle-Derivatives of sum, difference, product and quotient of two functions- Differentiation using functions of function rule (Simple problem based on it)
12. Logarithmic differentiation (Simple problem based on it)- Differentiation by substitution method and simple problems based on it- Differentiation of Inverse Trigonometric functions
13. Maxima and Minima of the functions of the form $y=f(x)$ and $y=f(x_1,x_2)$ (Simple problems based on it).
14. Integral Calculus - Integration of simple functions and Product of two functions- Definite Integral (simple problems based on it)
15. Integration by substitution method- Area under simple well-known curves (simple problems based on it).
16. Agricultural systems - Mathematical models - classification of mathematical models- Linear model.
17. Quadratic and Exponential models- applications of mathematical models in agriculture.

Practical Schedule:

1. Simple problems in Permutation and Combination.
2. Problems in Addition, Subtraction, Multiplication and Transpose of a matrix
3. Problems in determinants and Inverse up to 3rd order by adjoint method.
4. Problems in Straight lines using distance formula, section formula (internal and external division), Change of axes (only origin changed)- Equation of co-ordinate axes- Equation of lines parallel to axes.
5. Problems in Slope-intercept form of equation of line, Slope-point form of equation of line, two point forms of equation of line, Intercept form of equation of line.
6. Problems in Normal form of equation of line, General form of equation of line, Point of intersection of two straight lines.
7. Problems in Angles between two straight lines, Parallel lines, Perpendicular lines, Angle of bisectors between two lines.
8. Problems in 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) .
9. Simple problems in limit and continuity.
10. Problems in differentiation of x^n , e^x , $\sin x$ & $\cos x$, derivatives of sum, difference, product, quotient of two functions and differentiation of functions of functions.
11. Simple problem based on Logarithmic differentiation and differentiation by substitution method.
12. Problems in Maxima and Minima of the functions of the form $y=f(x)$ and $y=f(x_1,x_2)$
13. Problems in integration of simple functions and product of two functions using integration by parts- Definite Integral.
14. Integration by substitution method-Problems in Area under simple well-known curves

15. Problems in fitting linear models to experimental data .
16. Problems in fitting Quadratic and Exponential models to experimental data.
- 17. Final Practical Examination.**

References:

1. Mehta, B. C. and G. M. K. Madhani, 2014, Mathematics for Economists, Sultan Chand & Sons, New Delhi.
2. Kailasam.C, Pangayar Selvi. R and Vasanthi. R, 2010 , Applied Mathematics, Agrobios (India), Jodhpur
3. James Stewart and Barhara Frank, Calculus, 2008, International Thomson Publishers, Singapore
4. Duraipandian, 2007, Calculus and Analytical Geometry, Emerald Publishers, Chennai.
5. Ranganathan.C.R. 2006, A First Course in Mathematical Models of Population Growth (with MATLAB programs), Associated publishing company, New Delhi
6. Manickavasagam Pillai, T. K and Natarajan, T. 2004. Calculus, Viswanathan, Publications, Madras.

PBG 101 Introductions to Agricultural Botany (1+1)

Aim: To expose the students to the basic features of botanical description, economic parts and economic importance of different field and horticultural crops

SYLLABUS FOR THEORY

Unit I: Systems of classification and general morphological description

Bentham and Hooker's classification of plant kingdom — International code of nomenclature and its major guidelines – author citation – Agricultural classification of crops; General morphology: Life span, habit, root, stem, leaf - petiole, leaf margin, leaf apex, leaf shape, venation and phyllotaxy; Modification of roots and leaf; Floral morphology: Kinds of bracts, inflorescence; Structure of flower, androecium, gynoecium, placentation, types of fruits.

Unit II: Botanical description and economic uses of Poaceae

List of cultivated crops, economic parts, chromosome number and family description of Poaceae: Key botanical features of Rice, Wheat, Sorghum, Maize, Pearl millet, Finger millet, list of small millets, Guinea grass, Napier grass, *Cenchrus* and Sugarcane

Unit III: Botanical description and economic uses of Papilionaceae

List of cultivated crops, economic parts, chromosome number and family description of Papilionaceae: Key botanical features of Red gram, Bengal gram, Soybean, Black gram, Green gram, Cowpea, Lablab, Horse gram, Groundnut, Lucerne, *Stylosanthes*, Clitoria, Agathi and Sunnhemp,

Unit IV: Botanical description and economic uses of Pedaliaceae, Asteraceae, Oleaceae, Brassicaceae, Euphorbiaceae, Arecaceae and Malvaceae

List of cultivated crops, economic parts, chromosome number and family description of the following families and Key botanical features of the crops given against them: Pedaliaceae - Gingelly; Asteraceae - Sunflower, Safflower, Chrysanthemum; Oleaceae – Jasmine; Brassicaceae - Rapeseed and Mustard, Cabbage, Cauliflower; Euphorbiaceae: Castor; Jatropha and Tapioca; Arecaceae: Coconut, Arecanut, Oilpalm, Sugarpalm; Malvaceae: Cotton, Mesta and Bhendi.

Unit V: Botanical description and economic uses of Tiliaceae, Piperaceae, Chenopodiaceae, Solanaceae, Mimosae, Moraceae, Cucurbitaceae, Alliaceae, Musaceae, Rubiaceae, Theaceae

List of cultivated crops, economic parts, chromosome number and family description of the following families and key botanical features of the crops given against them. Tiliaceae: Jute; Piperaceae: Betelvine; Chenopodiaceae: Sugar beet; Solanaceae: Tobacco, Potato, Chilli, Tomato and Brinjal; Mimosae: Desmanthes, Subabul and Acacia; Moraceae: Mulberry; Cucurbitaceae: Cucumber, Pumpkin, Ashgourd; Alliaceae: Onion and Garlic; Musaceae: Banana, Manila hemp; Rubiaceae: Coffee; Theaceae: Tea

SYLLABUS FOR PRACTICAL

Family features - observation and description of habit, morphology of root, stem, leaves, inflorescence, flowers, floral diagram, floral formula and economic parts of Poaceae: Rice, Wheat, Sorghum, Maize, Pearl millet, Finger millet, Guinea grass, Napier grass, *Cenchrus* and Sugarcane; Papilionaceae: Redgram, Bengal gram, Soybean, Blackgram, Greengram, Cowpea, Lab-lab, Horse gram, Groundnut, Lucerne, *Stylosanthes*, Clitoria, Agathi and Sunnhemp; Pedaliaceae: Gingelly; Asteraceae: Sunflower, Safflower and Chrysanthemum; Oleaceae: Jasmine; Brassicaceae: Rape and Mustard, Cabbage, Cauliflower; Euphorbiaceae: Castor, Jatropha, Tapioca; Arecaceae: Coconut, Arecanut, Oilpalm and Sugar palm; Malvaceae: Cotton, Mesta, Bhendi; Tiliaceae: Jute; Piperaceae: Betelvine; Chenopodiaceae: Sugar beet; Solanaceae: Tobacco, Potato, Chilli, Tomato and Brinjal; Mimosae: Desmanthes, Subabul and Acacia; Moraceae: Mulberry; Cucurbitaceae: Cucumber, Pumpkin, Ashgourd; Alliaceae: Onion and Garlic; Musaceae: Banana, Manila hemp; Rubiaceae: Coffee; Theaceae: Tea

Theory schedule

1. Bentham and Hooker's classification of plant kingdom — International code of nomenclature and its major guidelines – author citation – Agricultural classification of crops
2. General morphology: Life span, habit, root, stem, leaf - petiole, leaf margin, leaf apex, leaf shape, venation and phyllotaxy; Modification of roots and leaf
3. Floral morphology: Kinds of bracts, inflorescence; Structure of flower, androecium, gynoecium, placentation, types of fruits.
4. List of cultivated crops, economic parts, chromosome number and family description of Poaceae; Key botanical features of Rice and Wheat.
5. Key botanical features of sorghum, maize, pearl millet and finger millet. List of small millets
6. Key botanical features of Guinea grass, Napier grass, *Cenchrus* and sugarcane.
7. List of cultivated crops, economic parts, chromosome number and family description of (Papilionaceae) Key botanical features of Red gram, Bengal gram and Soybean
8. Key botanical features of Black gram, Green gram, Cowpea, Lab lab, Horse gram and Groundnut.
9. **Mid Semester Examination**
10. Key botanical features of Lucerne, *Stylosanthes*, Clitoria, Agathi, and Sunnhemp.
11. List of cultivated crops, economic parts, chromosome number and family description of Pedaliaceae and Asteraceae: Key botanical features of Gingelly, Sunflower, Safflower, Chrysanthemum; Oleaceae: Jasmine

12. List of cultivated crops, economic parts, chromosome number and family description of Brassicaceae and Euphorbiaceae; Key botanical features of Rapeseed and Mustard, Cabbage, Cauliflower, Castor, Jatropha and Tapioca
13. List of cultivated crops, economic parts, chromosome number and family description of Arecaceae and Malvaceae; Key botanical features of Coconut, Arecanut, Oilpalm, Sugarpalm, Cotton, Mesta and Bhendi.
14. List of cultivated crops, economic parts, chromosome number and family description of Tiliaceae, Piperaceae and Chenopodiaceae; Key botanical features of Jute, Betelvine, Sugar beet.
15. List of cultivated crops, economic parts, chromosome number and family description of Solanaceae, Mimosae and Moraceae; Key botanical features of Tobacco, Potato, Chilli, Tomato and Brinjal, Desmanthes. Subabul, Mulberry
16. List of cultivated crops, economic parts, chromosome number and family description of Cucurbitaceae and Alliaceae; Cucurbitaceae: Key botanical features of Cucumber, Pumpkin, Ashgourd; Alliaceae: Onion and Garlic
17. List of cultivated crops, economic parts, chromosome number and family description of Musaceae, Rubiaceae and Theaceae; Key botanical features of Banana, Manila hemp, Coffee and Tea

Final Theory Examination

Practical schedule

1. Observing general morphology of roots, stems and leaves.
2. Observing general morphology of inflorescence - flowers, stamens and pistils.
3. Family characters, Botany, Economic parts, Floral diagram and Floral formula of the following crop plants:- Poaceae: Rice and Wheat
4. Poaceae: Sorghum, Maize, Pearl millet, Finger millet.
5. Poaceae: Guinea grass, Napier grass, *Cenchrus* and Sugarcane.
6. Papilionaceae: Redgram, Bengal gram and Soybean.
7. Papilionaceae: Blackgram, Greengram, Cowpea, Lab-lab, Horse gram and Groundnut.
8. Papilionaceae: Lucerne, *Stylosanthes*, Clitoria, Agathi, Sunnhemp, and Sesbania.
9. Pedaliaceae: Gingelly; Asteraceae: Sunflower, Safflower and Chrysanthemum;
Oleaceae: Jasmine
10. Brassicaceae: Rapeseed and Mustard, Cabbage, Cauliflower.

11. Euphorbiaceae: Castor, Jatropha, Tapioca; Arecaceae: Coconut, Arecanut, Oilpalm and Sugar palm.

12. Malvaceae: Cotton, Mesta, Bhendi

13. Tiliaceae: Jute; Piperaceae: Betelvine; Chenopodiaceae: Sugar beet;

14. Solanaceae: Tobacco, Potato, Chilli, Tomato and Brinjal; Mimosae: Desmanthes, Subabul , Moraceae:Mulberry

15. Cucurbitaceae: Cucumber, Pumpkin, Ashgourd; Alliaceae: Onion and Garlic

16. Musaceae: Banana, Manila hemp; Rubiaceae: Coffee; Theaceae: Tea

17. Final Practical Examination

Assignment

❖ Collection and preparation of 25 herbarium specimens representing minimum of ten families of the crop species studied.

Outcome

❖ Botanical features and economic importance of different crop plants belonging to 20 families will be exposed.

References

1. Daniel Sundararaj, D. and G. Thulasidas, 1993. Botany of field crops. MacMillan India Ltd., New Delhi.
2. Sambamurthy, V.S. and N.S. Subramanian, 1989. Text Book of Economic Botany, Wiley Eastern, New Delhi

Further reading

1. Purse glow, 1988. Tropical Crops - Monocotyledons. The English Language book

Society and Longman Co., Singapore

2. Purse glow. 1988. Tropical Crops - Dicotyledons. The English language book Society and Longman Co., Singapore.
3. Albert F. Hill and O.P. Sharma, 1996. Economic Botany. Tata McGraw - Hill Publishing Co. Ltd., New Delhi.
4. John Joel, A., C. Vanniarajan, T.S. Raveendran, and A. Gopalan 2006. Fundamentals of Crop Botany, Directorate of ODL, Tamil Nadu Agricultural University, Coimbatore-641 003.

Web resources

❖ www.nmsu.edu

❖ www.biology200.gsu.edu

Objective

This course will enable students to acquire knowledge on basics concepts related to rural sociology and educational psychology. Students will also learn the practical applications of important sociological and psychological concepts.

Theory

UNIT I

Introduction to Sociology, Social groups, Culture and Social Values

Sociology and Rural Sociology – definitions; Society – rural and urban, characteristics, differences and relationships, important characteristics of Indian rural society; Social groups – definition, classification, role of social groups in extension; Culture – concept, cultural traits, characteristics, functions, Ethnocentrism, Acculturation, Cultural lag, Cultural diffusion, Marginal man, Ethos. Social Values – definition, values and norms, characteristics of values, functions;

UNIT II

Social Structure, Social Stratification and Migration

Structure of Rural Society – patterns of rural settlement, social institutions, social organizations, ecological entities (Region, Community, Neighbourhood, Family); Social Stratification – concept, functions, types, differences between class and caste system; Migration – concept, factors influencing migration.

UNIT III

Social Control, Social Customs

Social Control – definition; Customs – conventions, folkways, mores, rituals, taboos; Social Interaction Process – definition, basic social processes; Social Change – concept, factors influencing social change, indicators of social change; Social development :

UNIT IV

Introduction to Educational Psychology, Intelligence, Teaching-Learning Process;

Education – Psychology – Educational Psychology – Social Psychology – definitions, importance in extension; Basic principles of Human behaviour – Sensation, Attention, Cognitive, affective, psychomotor domain Perception – meaning, characteristics; Intelligence – concept, types, measurement, factors affecting intelligence; Personality – concept, types, measurement, factors influencing personality; Teaching–Learning Process – Teaching – definition, meaning, principles of teaching, steps in extension teaching; Learning – definition, meaning, principles, types of learning, learning situation.

UNIT V

Motivation, Attitude

Motivation – concept, Maslow’s hierarchy of needs, intrinsic and extrinsic motivation, techniques of motivation, importance in extension; Attitude – concept, factors influencing the development of attitudes.

Theory Schedule

1. Sociology and Rural Sociology – Definitions, nature of rural sociology,
2. Importance of rural sociology in extension education.
3. Society – rural and urban, characteristics, differences and relationship, important characteristics of Indian rural society;
- 4.. Social Groups – definitions, classification, role of social groups in extension.
5. Culture – concept, cultural traits, characteristics, functions,
- 6.. Ethnocentrism, Acculturation, Cultural lag, Cultural diffusion, Marginal man, Ethos.
7. Structure of Rural Society – patterns of rural settlement,
8. Social institutions, Social organizations and ecological entities - Region, Community, Neighbourhood, and Family.
9. Social Stratification – concept, functions, types, differences between class and caste system;
10. Social Values – definition, values and norms, characteristics of values, functions.
11. Migration – concept, factors influencing migration.
12. Social Control – definition;
13. Customs – conventions, folkways, mores, rituals, taboos;
14. Social Interaction Process – definition, basic social processes.

15. Social Change – concept, theories, factors and indicators of social change.
16. Social development
17. Mid semester Examination.
18. Education – Psychology – Educational Psychology –definitions, importance in extension.
19. Social Psychology – Definitions, importance in extension.
20. Basic principles of Human behaviour –
21. Cognitive, affective, psychomotor domain
22. Perception – meaning, characteristics.
23. Sensation, Attention
24. Intelligence – concept, types,
25. Intelligence - measurement, factors affecting intelligence;
26. Personality – concept, types,
27. Personality measurement- factors influencing personality
28. Teaching–Learning Process – Teaching – definition, meaning,
29. Principles of teaching, steps in extension teaching.
30. Learning – definition, meaning, principles,
31. Types of learning, learning situation.
32. Motivation – concept, Maslow’s hierarchy of needs (including selfless-service), intrinsic and extrinsic motivation,
Techniques of motivation, importance of motivation in extension.
- 33.
34. Attitude – concept, factors influencing the development of attitudes.

Suggested Readings (Textbooks, Reviews, Journals)

- Adivi Reddy, A. 2001. Extension Education, Sree Lakshmi Press, Bapatla, Andhra Pradesh.
- Chatterjee, S. 2000. Advanced Educational Psychology, Books & Allied (P) Ltd., Calcutta.
- Chauhan, S.S. 2001. Advanced Educational Psychology, Vikas Publishing House Pvt. Ltd., New Delhi.
- Chitambar, J.B.1997. Introductory Rural Sociology, New Age International (P) Ltd., Publishers, New Delhi.
- Dahama, O.P. and O.P. Bhatnagar. 2007. Education and Communication for Development, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Kundu, C.L and Tutoo, D.N. 2001. Educational Psychology, Sterling Publishers Pvt. Ltd., New Delhi.
- Lester Crow, D and Alice Crow. 1973. Educational Psychology, Eurasia Publishing House Pvt. Ltd., New Delhi.
- Madumita Gupta. 2011. Fundamentals of Sociology, Pacific Publications, New Delhi.
- Mangal, S.K. 2000. Educational Psychology, Prakash Brothers, Ludhiana.
- Shankar Rao, C.N. 2012. Sociology – Principles of Sociology with an Introduction to Social Thought, S.Chand & Co. Ltd., New Delhi.
- Sharma, R.N. 1968. Principles of Sociology, Asia Publishing House, New Delhi.
- Supe. S.V. 2012. Text book of Extension Education, Agrotech Publishing Academy, Udaipur.
- Usha Rao. 2008. Advanced Educational Psychology, Himalaya Publishing House, New Delhi.
- Vidya Bhushan and Sachdeva, D.R. 2003. An Introduction to Sociology, Kitab Mahal, Allahabad.

Journals

- Indian Journal of Social Research
- Journal of Rural Development
- Journal of Social Sciences
- Journal of Advances in Social Work
- Journal of Asian Social Sciences
- Journal of Social Sciences and Research
- Journal of Current Research in Social Psychology
- Journal of Rural Sociology
- Journal of Extension Education - Coimbatore

Web resources

- www.sociologyguide.com
- eu.wikipedia.org
- www.princeton.edu

2017- ICAR Syllabus

ENG. 102 - DEVELOPMENT EDUCATION (0+1)

(Alternate course for non-Tamil students)

Aim: To impart the students

- Basic principles of learning
- Taxonomy of education
- Career development and entrepreneurship
- Communication skills

Unit I – Basic principles of learning

Basic principles of learning - discussion - Bloom's classification of educational objectives – cognitive, affective, psychomotor domain(s) - teaching and learning.

Unit II – Career development

Career development – growth and development, education – for – life and life – long education, motivation and morale - occupation and profession, training and education, lateral thinking and convergent thinking.

Unit III – Entrepreneurship

Entrepreneur- intrapreneur – managing an intrapreneur – motivation and entrepreneurship - development – planning, monitoring and evaluation.

Unit IV- Communication skills

Interpersonal communication – transactional communication - role – play - brainstorming – demonstration -the conduct of symposium - conferencing – the concept and presentation of a paper - scientific article writing and editing - popular article writing, editing and blogging -project proposal - project report – writing.

Unit V- Simulation exercises

Simulation - educational simulation-Interactive teaching - business simulation – company's annual report for analysis.

Lecture Schedule

1. Basic principles of learning - binary terms viz., growth and development, education – for – life and life – long education, motivation and morale .
2. Occupation and profession, training and education, lateral thinking and convergent thinking, teaching and learning – discussion.
3. Bloom's classification of educational objectives – cognitive, affective, psychomotor domain(s)
4. Career development – opportunity for graduates of agriculture and allied sciences – discussion
5. Success story of a farmer / entrepreneur – factors involved – role – play.
6. Brainstorming – demonstration.
7. Simulation – Educational Simulation-Interactive Teaching - Business Simulation – Company's annual report for analysis
8. Interpersonal communication – Transactional communication – ice breaker
- 9. MID SEMESTER EXAMINATION**
10. The conduct of a symposium
11. Conferencing – the concept and presentation of a paper

12. Scientific Article Writing and Editing
13. Popular Article Writing, Editing and Blogging
14. Project proposal
15. Project Report – writing
16. Entrepreneur – intrapreneur – Managing an intrapreneur – motivation and entrepreneurship development – planning, monitoring and evaluation.
17. **FINAL PRACTICAL EXAMINATION**

Outcome:

- Understand the concepts of learning,
- The necessity for Lifelong education,
- Communication skills in terms of career development

Text book:

1. Sudarsanam.R 1985. "Development Education" Chapter 1,2
2. Krishna Mohan and Meera Banerji, (1990). "Developing Communication Skills", Macmillan Pub. Co., Ch.6,9,10,13 and 15.

e-books:

URL : <http://www.e-booksdirectory.com/details.php?ebook=9481>

References

Bloom,B.S.Hastings J.T. and Maduas J.F, *Handbook on Formative and Summative Evaluation of Student Learning*, Mc Graw Hill Pub, New York, 1971.

Day, A Robert, *How to Write and Publish a Scientific Paper*, CUP, 1993.

Hariharan.S. *Brainstorming and Interactive Learning*, Research Quarterly, ADU, Coimbatore, 1995.

Mathew.M. Monipally. *The craft of Business Letter Writing*, Tata McGraw Hill Pup., Ch. 10 & Appendix – I, 1997.

Seely John, *Communicating in Everyday Life*, The Oxford Guide to Writing and Speaking, OUP. P.1-79, 1988.

Sudarsanam.R. *Development Education*, Chapter 1,2, 1985.

Taneja.R.P, *Dictionary of Education*, Anmol Pub., New Delhi, India, 1991.

Wallace, L.Michael, *Study Skills in English*, CUP Unit.4, 1998.

TAM 101 இலக்கியங்களில் வேளாண்மையும் அறிவியல் தமிழ்ப் பயனாக்கமும் (0+1)

நோக்கம்

இளநிலை வேளாண்மை பயிலும் மாணவர்களுக்கு தமிழ் இலக்கியங்கள் வழி வேளாண்மை மற்றும் வேளாண்மை சார்ந்த தொழில்நுட்பங்களையும் செய்திகளையும் அறியச் செய்தல்- தற்கால வேளாண் தொழில்நுட்பங்களோடு பொருத்திப் பார்த்தல் - வேளாண்மை தவிர தோட்டக்கலை - வனவியல்- வேளாண்பொறியியல் - மனையியல் சார்ந்த கருத்துக்களை வெளிக்கொணர்தல் - வேளாண்துறைக்கு இன்றியமையாத கலைச்சொற்கள் - மொழிப்பெயர்ப்பு - பாரம்பரிய தொழில்நுட்பங்களை அறியச்செய்தல் - மாணவர்களின் எதிர்காலத் தேவைக்கு அடிப்படையான பேச்சுப்பயிற்சி - நேர்காணலை எதிர்கொள்ளும் வகையில் மென்திறன்களான தலைமைப்பண்பு - ஆளுமைப்பண்பு - காலமேலாண்மை ஆகியவற்றில் திறம்பெறச்செய்தல் - மாணவர்களின் ஆய்வுக்கட்டுரை திறனை வளர்த்தல் - வேளாண்மை இதழ்கள், நூல்கள் குறித்து விழிப்புணர்வை வழங்குதல் - கணினி வழி தமிழில் வேளாண் செய்திகளை பதிவேற்றம், பதிவிறக்கம் செய்யும் முறைகளை அறியச்செய்தல் ஆகியவற்றை நோக்கமாக கொண்டு பாடத்திட்டத்தை வரையறை செய்தல்.

பாடத்திட்டம்

தொல்காப்பியம் காட்டும் முதற்பொருள், கருப்பொருள் - சங்க இலக்கியத்தில் வேளாண் தொழில் நுட்பங்கள் - பதினெண் கீழ்க்கணக்கு நூல்களில் வேளாண்மைஅறிவியல் - பள்ளு இலக்கியங்கள், ஏரெழுபது, இலக்கியத்தில் வேளாண் பொறியியல் - தோட்டவியல் - வனவியல் மனையியல் - சூழலியல் வேளாண்மைப் பழமொழிகள் - இலக்கியம் காட்டும் வாழ்வியல் நெறிமுறைகள் - இக்கால இலக்கியங்களில் வேளாண்மைச் சிந்தனைகள் - பிழையின்றிஎழுதும் முறைகள் - பாரம்பரியத் தொழில்நுட்பங்கள் - இலக்கியத்தில் மென்திறன்கள் - அறிவியல் தமிழ் வளர்ச்சிநிலைகள் - கலைச்சொல்லாக்கம் - மொழிபெயர்ப்பு - கட்டுரைச் சுருக்கம் எழுதுதல் - கணினிஉலகில் தமிழ்

செய்முறைப் பயிற்சிகள்

1. தொல்காப்பியம் காட்டும் முதற்பொருள், கருப்பொருள், தாவரவியல் அறிவு, வேளாண் மாந்தர் குறித்த செய்திகளை அறிதல்
2. சங்க இலக்கியத்தில் வேளாண் தொழில் நுட்பங்கள் - (எட்டுத்தொகை, பத்துப்பாட்டு)
3. பதினெண் கீழ்க்கணக்கு நூல்களில் வேளாண்மைஅறிவியல்
4. பள்ளு இலக்கியங்கள், ஏரெழுபது-உழவர் வாழ்வியல் நெறிமுறைகளும் வேளாண்மைத் தொழில் நுட்பங்களும்
5. இலக்கியத்தில் வேளாண் பொறியியல் - தோட்டவியல் - வனவியல் - மனையியல் - சூழலியல்
6. வேளாண்மைப் பழமொழிகள் - உழவு விதைஅறிவியல் - பருவம் - மழை - நாற்றுநடுதல் - எரு இடுதல் - நீர்ப்பாசனம் - களைமேலாண்மை-பயிர்பாதுகாப்பு - அறுவடை-உழவர் சமுதாயம்
7. இலக்கியம் காட்டும் வாழ்வியல் நெறிமுறைகள்
8. இக்கால இலக்கியங்களில் வேளாண்மைச் சிந்தனைகள் - பாரதி, பாரதிதாசன் படைப்புகள் - புதுக்கவிதை
9. இடைநிலைப் பருவத்தேர்வு
10. பிழையின்றிஎழுதும் முறைகள் - எழுத்துப் பிழைகள் - சொற்பிழைகள் - சொற் பிரிப்புப்பிழை-வாக்கியப்பிழை-மெய்ப்புத் திருத்தம்
11. பாரம்பரிய வேளாண்மைத் தொழில்நுட்பங்கள்
12. இலக்கியத்தில் மென்திறன்கள் - தலைமைப்பண்பு - காலமேலாண்மை
13. ஆளுமைப்பண்பு மேம்பாடு-மனித உறவுத்திறன்கள் வளர்த்தல்
14. அறிவியல் தமிழ் வளர்ச்சிநிலைகள், வேளாண் நூல்கள், வேளாண் இதழ்கள் - அலுவலகக் கடிதம்
15. கலைச்சொல்லாக்கம் - வேளாண் கலைச் சொற்களைஉருவாக்கும் முறை- தரப்படுத்துதல் - இலக்கியவேளாண் கலைச்சொற்கள், வட்டாரவேளாண்மைவழக்குச் சொற்கள் - அகராதியியல்
16. மொழிபெயர்ப்பு - முக்கியவிதிகள் - படிநிலைகள் - மொழிபெயர்ப்பாளரின் இன்றியமையாப் பண்புகள் - வேளாண் செய்திகளைமொழிபெயர்த்தல் - கட்டுரைச் சுருக்கம் எழுதுதல்

17. கணினிஉலகில் தமிழ் - விக்கிபீடியா-வேளாண் செய்திகளைப் பதிவேற்றம் செய்தல் - வேளாண் செய்திகளை இணையதளவழிஅறிதல்

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