B.Voc (Farm Equipments Operation and Maintenance)

Scheme of Examinations

July 2021 – Onwards

Qualification Pack Code : AGR/Q1103
Job role : Agriculture Machinery Operator
NSQF Level : 4
Applicable NOS Code : AGR/N1107, AGR/N1108, AGR/N1109, AGR/N1110, AGR/N1111 and AGR/N9903

	Course Code	Category	Title of Course	No. of Credits	Duration of ESE Hours	Marks		
						CFA	ESE	TOTAL
SEMESTER – I :Agriculture Machinery Operator	21FEMV0101	GEC	Principles of Agriculture	3	3	**40**	**60**	**100**
	21ENGU01G2	GEC	General English I	3	3	**40**	**60**	**100**
	21FEMV0102	GEC	Workshop calculation and Science–I	3	3	**40**	**60**	**100**
	21FEMV0103	GEC	Engineering Drawing–I	3	--	**60**	**40**	**100**
	21FEMV0104	SDC	Selection and Operation of Agriculture Machineries	14	--	**60**	**40**	**100**
	21FEMV0105	SDC	Operation and Maintenance of Power Tiller	4	--	**60**	**40**	**100**
			Total	**30**				**600**

Qualification Pack Code : AGR/Q1106
Job role : Agriculture Machinery Mechanic
NSQF Level : 5
Applicable NOS Code : AGR/N1123, AGR/N1124, AGR/N1125 and AGR/N9903

	Course Code	Category	Title of Course	No. of Credits	Duration of ESE Hours	Marks		
						CFA	ESE	TOTAL
SEMESTER – II : Agriculture Machinery Mechanic	21ENGU02G2	GEC	General English–II	3	3	**40**	**60**	**100**
	21FEMV0206	GEC	Workshop calculation and Science–II	3	3	**40**	**60**	**100**
	21FEMV0207	GEC	Engineering Drawing–II	2	--	**30**	**20**	**50**
	21FEMV0208	GEC	Basic Workshop	2	--	**30**	**20**	**50**
	21GTPU001	GEC	Gandhi's Life, Thought and Work	2	--	**20**	**30**	**50**
	21FEMV0209	SDC	Servicing and Maintenance of Agriculture Machineries	14	--	**60**	**40**	**100**
	21FEMV0210	SDC	Inplant Training – I	4	--	**60**	**40**	**100**
			Total	**30**				**550**

Qualification Pack Code : AGR/Q1101
Job role : Tractor Operator
Applicable NOS Code : AGR/N1101, AGR/N1102 and AGR/N9903

	Course Code	Category	Title of Course	No. of Credits	Duration of ESE Hours	Marks		
						CFA	ESE	TOTAL
SEMESTER – III : Tractor Operator	21EVSU0001	GEC	Environmental Studies	4	3	**40**	**60**	**100**
	21SHSU0001	GEC	Shanti Sena	1	---	**50**	**--**	**50**
	21CSKU0301	GEC	Soft Skills	2	---	**50**	**--**	**50**
	21FEMV0311	GEC	Engineering Survey	3	---	**60**	**40**	**100**
	21FEMV0312	GEC	Operation and Maintenance of Micro Irrigation System	2	--	**30**	**20**	**50**
	21FEMV0313	SDC	Tractor Operation and Safety Measures	14	--	**60**	**40**	**100**
	21FEMV0314	SDC	Inplant training – II	4	--	**60**	**40**	**100**
			Total	**30**				**550**

Qualification Pack Code : AGR/Q1108
Job role : Tractor Mechanic
NSQF Level : 6
Applicable NOS Code : AGR/N1126, AGR/N1127, AGR/N1128, AGR/N1129, AGR/N1130 and AGR/N9903

	Course Code	Category	Title of Course	No. of Credits	Duration of ESE Hours	Marks		
						CFA	ESE	TOTAL
SEMESTER – IV : Tractor Mechanic	21CSAU04A1	GEC	Computer Fundamentals and office Automation	4	3	**40**	**60**	**100**
	21SPOU0001	GEC	Sports and Games	2	---	**50**	**--**	**50**
	21YOGV0001	GEC	Yoga Education	2	---	**50**	**--**	**50**
	21FEMV0415	GEC	Employability Skills	4	3	**40**	**60**	**100**
	21FEMV0416	SDC	Repair and Overhauling of Engine and Tractor System	14	---	**60**	**40**	**100**
	21FEMV0417	SDC	Inplant training – III	4	---	**60**	**40**	**100**
			Total	**30**				**500**

Qualification Pack Code : AGR/Q 1101, AGR/Q1102, AGR/Q1103, AGR/Q1106, AGR/Q1108
Job role : Agriculture Machinery Technician
Applicable NOS Code : AGR/N1103, AGR/N1104, AGR/N1105, AGR/N1106 and AGR/N9907

SEMESTER – V : Agriculture Machinery Technician	Course Code	Category	Title of Course	No. of Credits	Duration of ESE Hours	Marks		
						CFA	ESE	TOTAL
	21FEMV0518	GEC	Operation and Maintenance of Post Harvesting Equipments	4	---	60	40	100
	21FEMV0519	GEC	Operation and Maintenance of Pumps for Irrigation	4	---	60	40	100
	21FEMV0520	GEC	Operation and Maintenance of Renewable Energy Appliances	4	---	60	40	100
	21FEMV0521	SDC	Operation and Safety Measures of Combine Harvester	14	---	60	40	100
	21FEMV0522	SDC	Inplant training – IV	4	---	60	40	100
			Total	**30**				**500**

Qualification Pack Code : AGR/Q112
Job role : Agriculture Machinery Entrepreneur
NSQF Level : 7
Applicable NOS Code : AGR/N9910, AGR/N1140, AGR/N1140, AGR/N1141, AGR/N1139 and AGR/N9903

SEMESTER – VI : Agriculture Machinery Entrepreneur	Course Code	Category	Title of Course	No. of Credits	Duration of ESE Hours	Marks		
						CFA	ESE	TOTAL
	21FEMV0623	GEC	Entrepreneurship Development	4	3	40	60	100
	21FEMV0624	GEC	Book Keeping	4	3	40	60	100
	21FEMV0625	GEC	Agri Business and Project Management	4	3	40	60	100
	21FEMV0626	SDC	Function and Management of Agro Service Centre	14	-	60	40	100
	21FEMV0627	SDC	Project Work	4	-	60	40	100
			Total	**30**				**500**

FIRST SEMESTER

21FEMV0101- PRINCIPLES OF AGRICULTURE (3 credits)

OBJECTIVE:

- To teach different types of soils and climate suitable for raising different agricultural crops.
- To teach different agricultural practices and the recommendations of inputs for raising the crops.

UNIT–1: Introduction to Agriculture **:** Agriculture – art, science and business – branches of agriculture scope of agriculture in India and Tamil Nadu –History of agricultural development – development of scientific agriculture in world. National and International Institutions / Centers on agriculture research – Agronomy - definition and relationship with other disciplines.

UNIT–2: Soil Properties and Management: Physical Properties of Soils; Physical properties of soils-texture-mechanical components and structure. Soil pH – Problem soils their reclamation and management.

UNIT–3: Crop Adaptation and Distribution**:** Agronomic classification of crops–Their economic importance–major crops of India and Tamil Nadu–adaptation and distribution. Factors affecting crop distribution and production. Soils and agriculture seasons of India and Tamil Nadu.

UNIT–4: Farming Systems **:** Systems of farming – wet, irrigated, dry and rainfed farming. Factors governing choice of crops and varieties. Intensive cropping – crop rotation – advantages. Integrated Farming System (IFS) – organic farming – Principles – benefits – challenges – Natural farming – Eco-friendly agriculture and conservation agriculture –LESIA – Agro forest – components – benefits – types – challenges and opportunities.

UNIT–5: Basics of Agricultural Operations**:** Tillage, Sowing, Irrigation, Weeding, Plant protection – Pest, beast – environmental factors – integrated pest management – cultural practices – physical control – chemical control - Fertilizer application, Harvesting – hand picking – sickle – machine harvesting – selective harvesting – time based harvesting - Threshing, Drying and storage – its importance.

REFERENCES:

1. Balasubramaniyan, P and SP. Palaniappan. 2002. Principles and Practices of Agronomy, Agrobios (India), Jodhpur.
2. Dahama.A.K. 1996. Organic farming for sustainable Agriculture. Agro Botanical Publishers (India), Bikaner.
3. Gopal Chandra De. 1997. Fundamentals of Agronomy. Oxford and IBH Publishing Co.Pvt.Ltd., New Delhi.
4. ICAR. 1996. Handbook of agriculture. Indian Council of Agriculture Research, New Delhi.
5. Reddy. S.R. 1999. Principles of Agronomy. Kalyani publishers, New Delhi.
6. Sankaran, S. and V.T. Subbiah Mudaliar, 1997. Principles of Agronomy. The Bangalore Printing and publishing Company Ltd., Bangalore.
7. Singh. S.S. 1998. Principles and Practices of Agronomy. Kalyani publishers, New Delhi.
8. Somasundaram, E and A. Arokiaraj. 2002. Text book on Principles of Agronomy. Crystal Printers, Tiruchirappalli, Tamil Nadu.

LEARNING OUTCOME

- Students learn about different types of soils and climate suitable for raising different agricultural crops.
- Students learn about different agricultural practices and the recommendations of inputs for raising the crops.

21ENGU01G2: GENERAL ENGLISH I

(Language II Course – 3 Credits/ 3 Hours/wk.)

OBJECTIVES:

- To improve the English language skills of students with very limited abilities to use the language; and
- To focus on the language skills of the learners in a graded manner.

UNIT–I: Grammar

- What is Grammar?
- The Capital Letter
- Nouns & Pronouns

UNIT–II: Listening

- Teacher Narrations

UNIT–III Speaking Skills

- Self-Introduction
- Descriptions of persons, objects, places

UNIT–IV Reading & Vocabulary

- Graded reading comprehension passages

UNIT–V Writing Skills

- Sentence Construction
- Descriptive Paragraph writing

Textbook:

General English I Textbook/Course Material - Prepared by the School.

Reference Book:

Seaton, Anne & Y.H. Mew. *Basic English Grammar Book 1.* Irvine: Saddleback, 2007. Print.

21FEMV0102 - WORKSHOP CALCULATION AND SCIENCE – I (3 credits)

OBJECTIVE:

- To teach basic engineering mechanics for understanding agricultural machinery working principles.

UNIT–1: Machine **:** Machine – definition, farm machines – mechanical advantage, efficiency of the machine and velocity ratio – definition and calculation

UNIT–2: Motion: rotary motion; velocity – uniform velocity and variable velocity; acceleration –laws of motion – calculations

UNIT–3: Force**:** Force **–** definition of force, types of force Mass, Equilibrium, Pressure, Pressure in hydraulic systems, Hooke's law, Practical applications.

UNIT–4: Work**:** Work energy – types of work – types of energy – work energy theorem, power– Definition and calculation of Work, Power and Work done by a torque, types of energy - Conservation of energy – examples of conservation of energy – implications of conservation of energy, Energy equation, Kinetic energy – factors affecting kinetic energy- formula and examples

UNIT–5: Engine Power: Engine power – terminology used – bore, stroke, stroke bore ratio, swept volume, compression ratio; power – indicated power, brake power, belt power, drawbar power, power takeoff power – definition; measurement of engine power – common methods – watt meter – multi meter – energy meter – determination of specific fuel consumption, mechanical efficiency – definition: focus formula – factors affecting mechanical energy and thermal efficiency definition: focus formula – factors affecting thermal energy

REFERENCES

1. O.P. Singhal, 1998. Agricultural Engineering, Aman Publishing House, Merut(UP)
2. Sreevastave, A.C., 1990. Elements of Farm Machinery, Oxford and IBH Publication Co., New Delhi.
3. Senthilkumar, T., R. Kavitha and V.M.Duraisamy 2015. A Text Book of Farm Machinery**,** Thannambikkai Publications, Coimbatore. ISBN: 978-9381102305
4. Jagadishwar Sahay, 2010. Elements of Agricultural Engineering**.** Standard Publishers Distributors, New Delhi. ISBN: 978 – 818040440
5. Workshop Calculation and Science 2015 published by National Instructional Media Institute, Directorate General of Employment & Training, Chennai.

LEARNING OUTCOME

- Students will learn basic engineering mechanics for understanding agricultural machinery working principles.

21FEMV0103 - ENGINEERING DRAWING–I (3 credits)

OBJECTIVE:

- To teach the construction of geometrical figures and projection of 1D, 2D, 3D elements and sectioning of solids and development of surfaces

UNIT–1: Scales - Recommended scales, reduced & enlarged Drawing Sheet sizes: A0, A1, A2, A3, A4, A5, Layout of drawing sheet, sizes of title block and its contents. Using drawing instruments to draw straight lines, rectangles, squares, circles, polygons.

UNIT–2: Lettering and Dimensioning - Types of Lettering, Guide Lines for lettering, Recommended sizes of letters and numbers, Single stroke letters, Dimensioning - rules and systems of dimensioning – dimensioning a given drawing – machine drawing – elements of machine drawing – elements in drawing of engine – common types of engine drawing –software used for engine drawing – importance of machine drawing in engine design.

UNIT–3: Identify the alphabet of lines- Read and Interpret the meaning of various line types with examples- Object Lines, Hidden Lines, Center Lines, Phantom Lines, Dimension Lines, Extension Lines, Leaders, Break Lines -Long-break Line, Round, Solid, Hollow Cross Section, Section Lines – Common Manufacturing Materials, Cutting Plane Lines

UNIT–4: Geometric Construction - Bisecting a line - perpendiculars - parallel lines - division of a line; Angles - bisection, trisection, Tangent lines touching circles internally and externally Polygons - Regular polygons - circumscribed and inscribed in circles, conic sections.

UNIT–5: Orthographic Projection - Definition - Planes of Projection - Four quadrants – Reference Line, First angle projection - Third angle projection. Isometric Projection - Definition - Isometric axes, lines and planes, Isometric Scale - Isometric view. Drawing of isometric views of plane figures, Drawing of isometric views of prisms and pyramids, Drawing of isometric view of cylinders and cones – Parallel projection – perpendicular projection – multiple views – inter site lines – connecting points – benefits of orthographic projection – application of orthographic projection.

TEXT BOOKS:

1. K.V. Natarajan, 2006 A text book of engineering graphics, Dhanalakshmi Publishers, Chennai.
2. M.B. Shah and B.C. Rana, 2005, Engineering drawing, Pearson education.

REFERENCES:

1. N.D. Bhatt, 2003, Engineering Drawing, Chaotar publishing house 46th edition.
2. K.R. Gopalakrishnan.1998 Engineering Drawing (Vol. I & II) Subhas Publications
3. Luzadder and Duff, 2001, Fundamentals of Engineering Drawing Prentice Hall of India Pvt Ltd XI edition
4. K. Venugopal, 2002. Engineering graphics, New Age International (P) Limited.
5. Engineering Drawing Workbook (2014) by National Instructional Media Institute, Directorate General of Employment & Training, Chennai.

LEARNING OUTCOME

- Student conversant with the construction of geometrical figures and projection of 1D, 2D, 3D elements and sectioning of solids and development of surfaces

21FEMV0104 - SELECTION AND OPERATION OF AGRICULTURE MACHINERIES
(14 credits)

OBJECTIVE:

- To teach selection and operation of agricultural machineries used in farming operations according to crop and soil conditions.
- To operate agriculture machineries under different field conditions.

Identify different components, suitability according to the crop and soil conditions and learn the adjustments of depth and width control of the following farm machineries.

UNIT–1: Tillage machineries – Mould board plough, Disc plough, Chisel plough, Reversible disc plough; Disc harrow, Cultivator and Rotavator.

UNIT–2: Sowing Machineries–Seed-cum-fertilizer drill, Direct paddy seeder and Transplanter - Weeding Machineries – Dry land weeder, Cono weeder, and self propelled power weeder.

UNIT–3: Plant Protection Machineries – Sprayer: hands sprayer – knapsack sprayer – power sprayer – aerial sprayer – duster: Hand duster – power duster – tractor mounted sprayer, weeder, harvester, fogger, smoke generator, traps. Factors considered while choosing plant protection machinery – importance plant protection machinery.

UNIT–4: Harvesting Machineries – Self propelled paddy Reaper; Self propelled fodder harvester – Combine harvester – components, features, versatile machines, potato harvesters, fruit harvesters, vegetable harvesters and cotton pickers. Factors to be considered in selection of harvesting machines.

UNIT–5: Operational safety and health management – introduction; operational hazards and diseases – Physical hazards, chemical hazards, biological hazards, mechanical hazards and psycho-social hazards

REFERENCE BOOKS

1. Er. Sanjay Kumar, Er. Vishal Kumar and Dr. Ram Kumar Sahu, 2012, Fundamentals of Agricultural Engineering, Published by Kalyani Publishers, Chennai, ISBN: 978-93-272-2168-8

2. Ojha, T.P and A.M.Michael 2005. Principles of Agricultural Engineering Vol I. Jain Brothers, New Delhi. ISBN: 978-8186321638

LEARNING OUTCOME:

- Students able to select farm machinery according to the soil and crop condition
- Students able to lean the adjustments needed in the farm machineries according to the soil condition inorder to achieve good tilt.
- Students able to operate agriculture machineries under different field conditions.

21FEMV0105 – OPERATION AND MAINTENANCE OF POWER TILLER (4 Credits)

OBJECTIVES:

- To teach different components of power tiller and its functions.
- To teach operation and maintenance of power tiller.

UNIT–1: Familiarizing the tools for maintaining the power tiller–Identifying the different system of power tiller and its functions.

UNIT–2: Dismantling and assembling of the power tiller engine-Overhauling of steering clutch and brake of the power tiller

UNIT–3: Clutch **–** types – problems and solutions – maintenance tips - Adjustment of clutch assembly-Adjustment of transmission system

UNIT–4: Dismantling – Steps for dismantling, remove the attachments, drain fluids, disconnect the battery – remove the wheel assembly – detach the engine – separate the components – storage of parts - , checking, repairing and assembling of rotavator - Replacement of tyres of the tiller

UNIT–5: Periodical maintenance of the power tiller-Preventive maintenance of the power tiller- common troubles and remedies- Field operations of the power tiller with suitable attachments – Field operation – soil preparation – tilling, weeding, furrowing ridging – planting – planting seeds, transplanting seedlings – cultivation – harvesting. Factors to be considered for field operations – soil conditions – safety – maintenance – fuel efficiency – legal regulations

REFERENCES

1. Repair, Maintenance & Operation of Power Tiller, March 2011 Sector : Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Mechanic Tractor, February 2016 Sector : Automobile, Common for Mechanic Tractor / Mechanic Agriculture Machinery, Trade: Practical, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
3. R K Ghosh & S Swain, 1993, Practical Agricultural Engineering, Naya Proksah publications, Kolkata, ISBN: 81-85421-15-3

LEARNING OUTCOME

- Students learn the components and its functions of power tiller.
- Students learn to operate the power tiller with suitable attachment in field conditions.
- Students learn to know the reasons for common trouble occur and how to rectify in the power tiller.

SECOND SEMESTER

21ENGU02G2: GENERAL ENGLISH II

(Language II Course – 3 Credits/3 Hours/wk.)

Objectives:

- To build on the English language skills of students initiated in the previous semester; and
- To focus on the language skills of the learners in a graded manner.

UNIT–I: Grammar

- Adjectives
- Determiners
- Verbs & Tenses
- Subject-Verb Agreement

UNIT–II Listening

- Teacher/Peer Readings
- Story Narrations

UNIT–III Speaking Skills

- Basic conversation
- Narration of events

UNIT–IV Reading & Vocabulary

- Graded reading comprehension passages

UNIT–V Writing Skills

- Narrative paragraphs
- Note Making

Textbook:

General English II Textbook/Course Material - Prepared by the School.

Reference Book:

Seaton, Anne & Y.H. Mew. *Basic English Grammar Book 1.* Irvine: Saddleback, 2007. Print.

21FEMV0206 – WORKSHOP CALCULATION AND SCIENCE–II (3 Credits)

OBJECTIVE:

- To teach the principles of lever, moments, friction, heat and temperature, basic electricity and capacitors

UNIT–1: Levers and moments**:** The principle of moments - the bell crank lever, a practical application of the bell crank lever in vehicle. Axle loadings, a steering mechanism as a machine

UNIT–2: Friction **:** Definition of friction, Coefficient of friction, Static friction, Sliding friction; Making use of friction – Clutch- Torque & power transmitted by a plate clutch and model calculation, Factors affecting friction, benefits and drawbacks of friction, steps for reducing the friction, Belt drive- Torque & power transmitted by a belt drive and model calculation, speed ratio of belt drive.

UNIT–3: Heat and temperature **:** Definition, units, differences, boiling point, melting point, temperature measuring instruments, specific heat, transmission of heat, expansion of solids, liquids, gaseous, quantity of heat with practical examples - thermal conductivity.

UNIT–4: Basic Electricity **:** Introduction, sources of electricity, uses of electricity, classification, types of electric current, advantages, simple electric circuits, ohms law, insulating materials, electrical conductors, electric power, horse power, work and energy, concept of earthing – Electronics in agricultural machinery – gates – AND, OR, NOT, NAND, NOR, XOR, XNOR – Application of gates

UNIT-5: Capacitors - Capacitance, Capacitors in circuits- Contact breaker ignition circuit – Electronic principles- Introduction, Semiconductors- Effect of dopants, Electrons and holes; Light Emitting Diode (LED)- Voltage and current in an LED, Basic operation of transistor, Current gain in transistor, Current flow in transistors; Transistor circuit used in automotive applications- Voltage amplifier, Darlington pair, Heat sink.

TEXT BOOKS

1. Sanjay Kumar, 2007, A Text Book of Tractor at a Glance, International book distributing company, Lucknow
2. Senthilkumar, T., R. Kavitha and V.M.Duraisamy, 2015. A Text Book of Farm Machinery**,** Thannambikkai Publications, Coimbatore. ISBN: 978-9381102305
3. Jagadishwar Sahay, 2010. Elements of Agricultural Engineering**.** Standard Publishers Distributors, New Delhi. ISBN: 978 – 818040440
4. Workshop Calculation & Science, 2015, NIMI Publications, Chennai

LEARNING OUTCOME

- Students learn the basic principles of lever, moments, friction, heat and temperature, basic electricity and capacitors
- Students learn to calculate the moment, torque, thermal conductivity, heat loss and heat gain, simple electric circuit, electric power, work and energy

21FEMV0207 – ENGINEERING DRAWING–II (2 Credits)

OBJECTIVE:

- To read and interpret drawings, identify different drawing projections, free hand sketching of machine and tractor engine systems.
- To simulate the shape and size of the components proportionately to the original

UNIT–1: Read and interpret drawings- Determine information from the title block, Read and interpret industrial prints, Read and interpret detailed and assembly drawings, Identify casting drawings and machining drawings, Read and interpret diagrams, Distinguish between a mono detail and a multi detail drawing.

UNIT–2: Drawing of I.C. engine – Diesel and their parts. Sketching of Diesel cycle, valves and valve timing diagram. Free hand sketch of piston assembly, Free hand sketching of piston gudgeon pins rings and connecting rod.

UNIT–3: Free hand sketching of crank shaft and cam shaft showing all parts. Free hand sketching of cylinder block and cylinder head, cylinder liners.

UNIT–4: Free hand sketching of different cooling system -showing all necessary parts such as water pump, thermostatic valve, Radiator etc. Free hand sketching of lubrication system, showing all necessary parts such as filters, oil pump, pressure release valve etc. Concept of axes plane and quadrant. - Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1 st angle and 3 rd angle projection as per IS specification. 3 hrs. 8. Drawing of Orthographic projection from isometric/3D view of blocks 6 hrs. Orthographic Drawing of simple fastener (Rivet, Bolts, Nuts & Screw) Drawing details of two simple mating blocks and assembled view.

UNIT–5: Free hand sketching of power take off (PTO) system. Freehand sketching of steering system. Free hand sketching of charging system and solenoid switch circuit. Dimensioning practice: - Position of dimensioning - Symbols preceding the value of dimension and dimensional tolerance. - Text of dimension of repeated features, equidistance elements, circumferential objects

REFERENCES:

1. Sanjay Kumar, 2007, A Text Book of Tractor at A Glance, International book distributing company, Lucknow
2. K.V. Natarajan, 2006 A text book of engineering graphics, Dhanalakshmi Publishers, Chennai.
3. M.B. Shah and B.C. Rana, 2005, Engineering drawing, Pearson education.
4. K.V. Natarajan, 2006 A text book of engineering graphics, Dhanalakshmi Publishers, Chennai.
5. N.D. Bhatt, 2003, Engineering Drawing, Chaotar publishing house 46th edition.
6. K.R. Gopalakrishnan.1998 Engineering Drawing (Vol. I & II) Subhas Publications
7. Luzadder and Duff, 2001, Fundamentals of Engineering Drawing Prentice Hall of India Pvt Ltd XI edition
8. K. Venugopal, 2002. Engineering graphics, New Age International(p) Limited.

LEARNING OUTCOME

- Students can read and interpret drawings, identify different drawing projections, free hand sketching of machine and tractor engine systems
- The student will be able to understand the shape and size of the components of the tractor, power tiller, tillage implements, rotavator, harrows, cultivator, seed drills, weeders, bund former and ridger

21FEMV0208 – BASIC WORKSHOP (2 Credits)

OBJECTIVE:

- To familiarize with the basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
- To familiarize with the production of simple models in the above trades.

UNIT–1: Welding**:** Tools and equipments - Arc welding of butt joint, tap joint, tee fillet, etc, Demonstration of gas welding. Heat treatment process-annealing, normalizing, hardening and tempering. Demonstration on use of hand Tools used in fitting: V-block, Marking Gauge, files ,Hacksaw, drill taps , use of surface plate Study of electric arc welding tools & equipment. Models: Butt Joint, Lap joint and T- joint.

UNIT–2: Fitting**:** Tools and equipments - Practice in chipping, filing, drilling, grinding, making vee joints, square and dove tail joints. Tap and dies and hand reamers. sheet metal & soldering work: Development & soldering of the models: Frustum of cone, prism (hexagon &pentagon),Truncated square prism. Funnel and tray. study and demonstration of power tools in Mechanical Engineering.

UNIT–3: Carpentry**:** Tools and equipments - Planning Practice - making halving joint and dove tail joint models, limits, fits, and tolerances with examples used in auto components

UNIT– 4: Plumbing**:** Tools and equipments - types of joints, treading fitting for different types of pipes-GI, PVC, HDPE. Study of different type of screws, nuts, studs, bolts and locking devices.

UNIT–5: Smithy: Tools and equipments-Demonstration of making simple parts like keys, bolts, etc. sheet metal operations-shearing, banding, drawing and squeezing

REFERENCES:

- S.K. Hajra Choudhury, A.K. Hajra Choudhury and Nirjhar Roy, 2001, Elements of Workshop Technology-Vol.1; Manufacturing processes, Media Promoters and Publishers Pvt, Ltd. Mumbai.

LEARNING OUTCOME

- Students learn the tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
- Students able to produce of simple models in the above trades.

21GTPU0001 – GANDHI'S LIFE, THOUGHT AND WORK (2 Credits)

OBJECTIVES

- To enable students to understand and appreciate the principles and practices of Gandhi and their relevance in the contemporary times.
- To develop character and attitude to follow Gandhian values and responsibilities in their personal and social life.

Specific Objectives of Learning:

This will make the students:

- To understand the life of Gandhiji in-depth.
- To get introduced to the relevant Gandhian philosophies.
- To apply the Gandhian concepts in the relevant context.
- To envision the Gandhian socio-economic, political and cultural ideas.
- To get educated on Gandhian lines in a multi-dimensional way.

Unit–1 : Life of Gandhi in brief: Early life in India – London Phase – South African Adventure - Struggle for total freedom in India – Martyrdom

Unit–2: Concepts of Gandhi's Philosophy, Truth and Nonviolence, Ends and Means, Right and Duties, Simple Living and High Thinking

Unit–3: Gandhi's concepts and their applications: Sarvodaya, Satyagraha, Santhi Sena Constructive Work

Unit–4: Gandhian Vision of Society: Self and society - Communal harmony, removal of untouchability and Equality of sexes – Policies: Decentralization of power, Gram Swaraj (Panchayatui Raj) and good governance - Economics of Swadeshi, Trusteeship, Bread Labour and Self-employment.

Unit–5: Gandhian Dimension of Education: Basic Education, Adult Education, Pluralism - Multilingualism, Religions and interfaith relations- Health; Diet, Nature Cure, Education on Health, Sanitation and Hygiene.

References:

- M.K. Gandhi: (1983), An Autography of the Story of My Experiments with Truth, Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: (1951), Satyagraha in South Africa: Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: (1983), Constructive Programme" Its Meaning and Place. Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: (1948) Key to Health, Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: (1949), Diet and Diet Reforms, Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: Basic Education, Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: (2004), Village Industries, Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: (1962), Hindi Swaraj, Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: (2004), Trusteeship Dreams, Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: (2001), India of my Dreams, Navajivan Publishing House, Ahmadabad.
- M.K. Gandhi: Self Restraint Vs. Self Indulgence, Navajivan Publishing House, Ahmadabad.
- Arunachalam: Gandhi: (1985), The Peace Maker, Gandhi Samarak Nidhi, Madurai.
- R.R. Prabhu & UR Rao. The Mind of Mahatma Gandhi, Navajivan Publishing House.

21FEMV0209 - SERVICING AND MAINTENANCE OF AGRICULTURE MACHINERIES
(14 Credits)

OBJECTIVE:

- To teach field adjustments for achieving proper ploughing, sowing, weeding, plant protection and harvesting
- To teach replacement of worn out parts, repair and maintenance of machineries.

Identify, use, maintain and store tools required for repair and servicing of different components; adjustments in width and depth control; method of hitching with tractor / power tiller of the following machineries.

UNIT–1: List different types of machineries and equipments which would be required for servicing and repair of farm machinery, Make a list of tools and equipments required for workshop. Select mode of purchase of tools and equipment by cash or loan, Select vendors for purchase of tools and equipment for centre

UNIT–2: Recruit workers as per the requirement- Assign work to mechanics - Describe procedure for repairing, -overhauling and servicing of machinery State importance of regular- maintenance of engines and cooling systems Organize duties and work plan for all the-workers Resolve team conflicts.

UNIT–3: Seed-cum-fertilizer drill, Direct paddy seeder and Transplanter - Weeding Machineries – Dry land weeder, Cono weeder, and self propelled power weeder. Monitor the progress of the assigned- work and prepare progress report Identify steps of troubleshooting -equipment during repairs

UNIT–4: State customer service centre counter- and its importance Fill forms of servicing or repair with- proper discussion, Check the machine and identify the- problem Prepare a rough estimate of repairing- Prepare bills of repairing work and handover farm machine to customer Follow up with customer- Tillage machineries – Mould board plough, Disc plough, Chisel plough, Reversible disc plough; Disc harrow, Cultivator and Rotavator.

UNIT–5: Safety while working in machinery – types of hazards occur while working in machinery; types of injury occur while handling different machinery tools and its preventive measures.

REFERENCE BOOKS

1. Er. Sanjay Kumar, Er. Vishal Kumar and Dr. Ram Kumar Sahu, 2012, Fundamentals of Agricultural Engineering, Published by Kalyani Publishers, Chennai, ISBN: 978-93-272-2168-8

2. Ojha, T.P and A.M.Michael 2005. Principles of Agricultural Engineering Vol I. Jain Brothers, New Delhi. ISBN: 978-8186321638

LEARNING OUTCOME:

- Student will acquire skill for adjusting the controls available in the plough, harrows, seed dril, weeder, sprayers and harvesters to reach the maximum output
- Students will learn to replacement of worn out parts repair and maintenance of agriculture machineries

21FEMV0210 – IN-PLANT TRAINING – I (6 credits)

OBJECTIVE: To learn skills for specific job role from relevant Industry / Institution.

Students have to undergo four weeks training in any Agricultural Machinery Manufacturing Industry / Training Institutes to acquire relevant skills. The in-plant training may be organized continuously for four weeks or more than one spell within a semester as per the convenience of the Industry/Institutes. During their stay in the industry, they have to maintain a diary on daily basis to record the work assigned, outcome of the work and it has to be countersigned by the student's in-charge. In addition, he/she has to submit weekly report to the department. During the in-plant training period, the Industry / Institute partner will evaluate their performance for 60 marks and the concerned course teacher for 40 marks as given below

INDUSTRY/ INSTITUTE

1	Attitude	10 marks
2	Punctuality	
3	Behavior	
4	Involvement	10 marks
5	Performance (completion of assigned work)	20 marks
6	Contribution to the industry	20 marks
	Total	**60 marks**

COURSE TEACHER

1	Diary /Record	10 marks
2	Weekly report	10 marks
3	Viva –voce	20 marks
	Total	**40 marks**

LEARNING OUTCOME

- Students learn the work culture from the concerned industry
- Students learn to handle special tools used in assembling and dismantling of machinery components.

THIRD SEMESTER

21EVSU0001- ENVIRONMENTAL STUDIES (4 Credits)

OBJECTIVES:

- To teach the importance in conservation of environment and natural resources.
- To teach causes, effects and control measures of environmental pollution.
- To teach the concepts of disaster management and preparedness to overcome

UNIT–1 : Natural Resources : Introduction to Environment and natural resources (Definition, scope and important) – Forest Resources: Use and over-exploitation of forest resources and its impact on forest and tribal people – Water Resources: Use and over-exploitation of water and impact – Land Resources: Land degradation and soil – erosion, desertification – Food Resources: Effects of modern agriculture, fertilizer-pesticide problems – Energy Resources: Growing energy needs renewable and non-renewable energy source-use of alternative energy sources.

UNIT–2: Ecosystem and Biodiversity: Concept of an ecosystem – Structure and function of an ecosystem – Energy flow in the ecosystem - Food chains, food webs and ecological pyramids – Types of ecosystem – Biodiversity: genetic, species and ecosystem diversity, India as a mega – diversity nation – Treats to biodiversity : habit loss, poaching of wild life, man-wildlife conflicts; Endangered and endemic species of India – Conservation of Biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT–3: Environmental Pollution: Causes, effects and control measure of: Air pollution, Water pollution, Soil pollution, Noise pollution and Nuclear hazards, Solid waste management, Global environmental problems.

UNIT–4: Social Issues and the Environment : Sustainable development, Rural Urban problems related to environment, Water management and rain water harvesting – Environment ethics: Issues and possible solutions, Environmental Protection Policy, Acts and Legislation, Population and the Environment – Environmental and Population concern: Environment and human health, Environment education at various levels – HIV/AIDS, Women and child welfare, gender issues, gender equity, institutions for gender studies / research.

UNIT–5: Disaster Management: Disaster: Meaning and concepts, types, causes and management – Effects of disaster on community, economy, environment – Disaster management cycle : early response, rehabilitation, reconstruction and preparedness – Vulnerability Analysis and role of community in Disaster Mitigation – The Disaster Management Act 2005 – Disaster Management Authority : National, State and District level – Ill effects of fireworks.

REFERENCES

1. Asthana, D.K., Meera Asthana, 2006, A text book of Environmental Studies, S.Chand & Company Ltd., New Delhi.
2. Benny Joseph, Tata Macgraw, 2005, Environmental Studies, Hill Publishing Company, New Delhi
3. Erach Bharueha, 2005, A text book of Environmental Studies, UGC, University Press, New Delhi.
4. Palanithurai, G, 2009, Panchayats in Disaster: Preparedness and Management, Concepts Publishing company.
5. Thangamani and Shyamala, 2003, A text book of Environmental Studies, Pranav Syndicate, Publication Division, Sivakasi.

LEARNING OUTCOME

- Students able to learn in-situ and ex-situ conservation of bio-diversity
- Students able to learn the control measures of environmental pollution

21SSNU0001 – SHANTI SENA (FC) (1 Credit)

(Foundation Course: Mandatory for all UG Students)
(1 Credit)

Evaluation: Internal Test and Viva Voce (both components carry equal weightage) by the course teacher

Objectives:

- To introduce the concept and practice of Shanti Sena (Peace Brigade) to the students.
- To give exposure and training to students in the skills needed for Nonviolent Conflict Resolution through Shanti Sena.

Unit–1: Shanti Sena: Meaning and conceptual framework – historical development - Organisation and functions of Shanti Sena: Shanti Kendras, All India Shanti Sena Mandal - Peaceful resolution of conflicts, Peace Making, Alternative to Defense and Violence.

Unit–2: Skills and Training for Shanti Sena: Skills of First Aid and Skills for disaster management, Peace Making Skills(Conflict Resolution and Counseling) and Transforming oneself into a Shanti Sainik.

Unit–3: Shanti Sena in India and Abroad: Contributions of Mahatma Gandhi, Khan Abdul Ghaffar Khan, Vinoba Bhave, Jayaprakash Narayan, Narayan Desai. Dr.G.Ramachandran and S.N.Subba Rao.

Unit–4: Organisations promoting Shanti Sena Studies, Training, Research and Action: Shanti Sena Vidyalaya (Vedchhi), Unit of Shanti Sena in Gandhigram Rural Institute, Centre for Experiencing Socio-cultural Interaction (CESCI), Madurai, G.Ramachandran Institute of Nonviolence, Thiruvanantapuram, Vinoba Bhave - Venkateshwar Rao Institute of Shanti Sena, Manjeswaram.

Unit–5: Experiments in Nonviolent Conflict Management and Peace: Peace Brigade International, U.N. Peace Keeping Force, War Resisters' International (WRI), Non-killing Global Academy (Honolulu), Quakers Movement (Friends) and Sarvodaya Shramadana Sangamaya Shanti Sena Units, Sri Lanka.

Learning Outcome:
Students will be able to:

- Comprehend the concept of Nonviolence, Shanti Sena and Methods of Peaceful Resolution of conflicts in their personal and social life.
- Shape and evolve themselves as peace makers and promoters of harmony and good will.

REFERENCES:

- Arunachalam K., (1985), Gandhi - The Peace Maker, Gandhi Smarak Nidhi, Madurai.
- Dennis August Almeida (2007), The Training of Youth In Nonviolence as a way to Peace, Gandhi Media Centre, Delhi and Thiruvananthapuram.
- Narayan Desai, (1972), Towards Non-Violent Revolution, Sarva Seva Sangh Prakashan, Varanasi. (1963), A Hand Book for Shanti Sainiks, Sarva Seva Sangh Prakashan, Varanasi.
- Radhakrishnan.N. Dr., (1989), Gandhi and Youth: The Shanti Sena of GRI, Gandhigram Rural Institute, Gandhigram.
- Ravichandran .T., (1999) *Communalism in Tamil Nadu (1979- 1991) and the Way Out,* Gandhi Media Centre, Madurai.
- Ramjee Singh, (2003), Shanti Sena: A Guide, Sarva Seva Sangh Prakashan, Varanasi.
- Suresh Ram, Vinoba and His Mission, Sarva Seva Sangh Prakashan, Varanasi.
- Thomas Weber (1996), Gandhi's Peace Army: The Shanti Sena and Unarmed Peace keeping.
- Vinoba Bhave (1961), Shanti Sena, Akhil Bharat Sarva Seva Sangh Prakashan, Varanasi.
- William Baskaran, M., (1998), Shanti Sena: A Gandhian Vision, Gandhi Media Centre, Madurai.

21CSKU0301: SOFT SKILLS (For Sciences)

(Compulsory Soft Skills Course – 2 credits – 2 hours/wk.)

Objectives:

- To help the students improve their communication skills; and
- To enhance their holistic development and improve their employability skills.

Unit - I POSITIVE A TTITUDE : attitude --- features of attitudes ---formation of attitudes— psychological factors --- change of attitudes –ways of changing attitude in a person – the power of positive attitude ---the benefits of positive attitude --- developing positive attitude --- obstacles in developing positive attitude -- negative attitude --- the causes of negative attitude ---the consequences of negative attitude ---how to change negative attitude

Unit - II GOAL SETTING—introduction –importance of goal setting – goal definition --- types of goals --- what exactly goal setting --- why people don't set goals ---how to choose the right goals – SMART GOALS ---Career goals ---benefits of career goal setting ---- goal setting tips

UNIT III COMMUNICATION SKILLS – communication process –types of communication --- barriers to effective communication --- listening skills --- importance of tone of voice --- voice clarity --- verbal expressiveness –tips to develop communication skills --- government initiatives – job roles

UNIT IV VOCABULARY ENRICHMENT -- definition and importance – word formation : prefixes and suffixes --- compound words ---- compound nouns – compound adjectives ---synonyms and antonyms ---homonyms – homophones --- idioms and phrases ----one word substitutes --- confused words –tips for vocabulary enrichment -- oral presentation : techniques and tasks --- self –introduction--- talking about objects --- description of person --- welcome speech --- vote of thanks ---

UNIT V RESUME WRITING: Definition --- Resume development ---how does a resume work for you – information that appears on most resumes --- resume writing tips – online resumes --- guidelines for submitting resumes on the web ---computer friendly resume tips

Textbook:

Antonysamy and Chandra. *Soft Skills and Personality Development: A Handbook of Employability Skills.* Chennai: Vijay Nicole, 2012.

Learning Outcome

- Students able to improve their communication skills
- Students able to improve their employability skills

Assessment: There is no ESE. Assessment is totally internal and is performance-based.

21FEMV0311 - ENGINEERING SURVEY (3 Credits)

OBJECTIVE:

- To measure the regular and irregular areas of a agricultural field by using chain survey.
- To prepare contour map and level difference of a given field by using levelling.

UNIT–I: Geomatics Engineering - definition, Importance and its relevance to engineering projects, basic principles. Classification ofsurveys based on instruments and survey work. Types of maps, scales and uses, plotting accuracy, map sheet numbering, coordinates and map projections.

Unit II Surveying equipment, Levels, Digital levels, Compass, Theodolites, Tapes, Tachometer, EDM, Total Stations, GPS, Smart Stations, and Laser based instruments. Adjustment in equipment.

Unit III Measurement of angles, directions and distances. Determination of elevation, spirit leveling, trigonometrical leveling, and tachometric surveying, Contouring, DEM, DEM derivatives, Cut and fill computations.

Unit IV Methods of control establishment, traversing, triangulation, trilateration, adjustment of survey measurements, computation of coordinates. Adjustment in traversing and triangulation.

Unit V surveying – principles and methods, applications, DGPS, error in observations and corrections. Layout – curve, bridges, buildings.

REFERENCES:

1. Zamir Alvi, 2004. A Textbook of Surveying, Vikas Publishing House Pvt, Ltd, New Delhi.
2. Singhal, O.P. 1998. Agricultural Engineering, Aman Publishing house, Meerut.
3. Dr.Bimal Chandra Mil. 1995. Introduction to soil and water conservation engineering, Kalyani Publishers, Calcutta.
4. Saini, G.S. 1996. A textbook of soil and water conservation, Amman Publishing house, Meerut.
5. Murthy, V.V.N Zoos.2009 Land and water Management, Kalyani Publishing, New Delhi

LEARNING OUTCOME

- Students to know about measuring the regular and irregular areas of a agricultural field by using chain survey.
- Students able to prepare contour map and level difference of a given field by using levelling.

21FEMV0312- OPERATION & MAINTENANCE OF MICRO IRRIGATION SYSTEMS
(2 Credits)

OBJECTIVE:

- To teach skills of designing, installation and maintenance of micro irrigation systems.

UNIT 1: Introduction to Micro- Irrigation 1.1 Introduction 1.2Overview 1.3Status 1.4 Merits and Demerits of Micro Irrigation

UNIT 2: Scope and Applications of Micro Irrigation 2.1 Potential and Prospects of Micro-Irrigation 2.2 Micro-Irrigation Applications: Hills, Arid Lands, Coastal and Wastelands

UNIT 3: Government of India Financial Assistance for Promotion of Micro Irrigation in India 3.1 Financing Assistance under National Mission on Micro-Irrigation 3.2 Financial Support from National Bank for Agriculture and Rural Development (NABARD) 3.3 Financial Assistance from National Horticulture Board (NHB)

UNIT 4: Types of Micro-Irrigation Systems 4.1 Drip Irrigation 4.2 Spray Irrigation 4.3 Sub-Surface System 4.4 Bubbler System

UNIT5: Components of Micro Irrigation System (MIS) 5.1 Control Head 5.2 Water Distribution Network 5.3 Emission Device

REFERENCES:

1. Sharma, S.K. 1984. Principles and practices of irrigation Engg., S.Chand and Company Ltd., New Delhi.
2. Michael, A.M. and T.P.Ojha. 1987. Principles of Agricultural Engineering. Vol.2. Jain Brothers, New Delhi.
3. Michael, A.M. 1983. Irrigation Theory & Practice, Vikas Publishing house, New Delhi.
4. Sivanappan, R.K. and Karaigowder. 1997. Irrigation and Drainage, Popular Book Depot, Chennai.
5. Basak, N.N. 1999. Irrigation Engineering. TATA McGraw Hill, New Delhi.

LEARNING OUTCOME

Students learn skills of designing, installation and maintenance of micro irrigation systems.

21FEMV0313 – TRACTOR OPERATION AND SAFETY MEASURES (14 Credits)

OBJECTIVE:

- To teach the tractor operation in field conditions
- To teach safety precaution measures observed before starting, operating and stopping the tractor.

UNIT–1: Tractor accessories - Familiarizing and functions of different components involved in engine, clutch, transmission, wheels, font axle, steering system, electrical system, hydraulic lift and power take off.

UNIT–2: Method of starting and to stopping a tractor – precautions observed while starting, operating and stopping a tractor – Periodical maintenance of tractors daily, weekly, monthly- as recommended by tractor manufacturer.

UNIT–3: General precautions observed in tractor systems – cooling, lubrication, air filter, fuel, transmission, hydraulic, electrical system, tyre pressure, dash board observations and noise observations.

UNIT–4: Ploughing of land – Methods of ploughing – Gathering and casting – Continuous ploughing method round and round ploughing – one way ploughing, ploughing with cage wheel and rotavator attachment. Safety in tractor operation; physical environment and protective wears – Thermal environment, Vibration, Noise, Dust, Exhaust Emission, Chemicals and Lighting.

UNIT–5: Driving class – Tractor and Tractor with implements

TEXT BOOKS

1. Sanjay Kumar, 2007, A Text Book of Tractor at a Glance, International book distributing company, Lucknow
2. Er. Sanjay Kumar, Er. Vishal Kumar, Dr. Ram Kumar Sahu, 2012, Fundamentals of Agricultural Engineering, Published by Kalyani Publishers, Chennai, ISBN: 978-93-272-2168-8
3. Dr. Jagdishwar Sahay, 2013, A Text Book of Elements of Agricultural Engineering, Standard Publishers Distributors, 1705-B, Naisarak, PB No:1066, Delhi-110 006, ISBN: 978-81-8014-204-8

LEARNING OUTCOME

- Students able to learn to operate the tractor with implement in field conditions
- Students able to learn the safety measures while operating the tractor in field conditions

21FEMV0314 - INPLANT TRAINING–II (4 Credits)

OBJECTIVE:

To learn skills for specific job role from relevant Industry / Institution.

Students have to undergo four weeks training in any Tractor Manufacturing Industry / Training Institutes to acquire relevant skills. The in-plant training may be organized continuously for four weeks or more than one spell within a semester as per the convenience of the Industry/Institutes. During their stay in the industry, they have to maintain a diary on daily basis to record the work assigned, outcome of the work and it has to be countersigned by the student's in-charge. In addition, he/she has to submit weekly report to the department. During the in-plant training period, the Industry / Institute partner will evaluate their performance for 60 marks and the concerned course teacher for 40 marks as given below

INDUSTRY/ INSTITUTE

1	Attitude	10 marks
2	Punctuality	
3	Behavior	
4	Involvement	10 marks
5	Performance (completion of assigned work)	20 marks
6	Contribution to the industry	20 marks
	Total	**60 marks**

COURSE TEACHER

1	Diary /Record	10 marks
2	Weekly report	10 marks
3	Viva –voce	20 marks
	Total	**40 marks**

LEARNING OUTCOME

- Students able to learn the work culture from the concerned industry
- Students learn to handle special tools used in assembling and dismantling of machinery components.

FOURTH SEMESTER

21CSAU04A1 – COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION (4 Credits)

OBJECTIVES

- To introduce the concepts of computer basics and terminologies.
- To identify hardware, software and Operating system needed for personal computer.
- To provide an in-depth training in use of Office Automation packages.

UNIT–1: Computer Concepts: Introduction to Computer; Characteristics of a Computer; History of Computers; Generations of Computer; Classification of Computers; Computer terminologies; Basic Components of Computer; Types of operating System; Types of Programming Languages

UNIT–2: Hardware Devices: Input Devices Definition, Types of Input devices; Output Devices – Definition, Types of Output devices; Storage Devices — Definition , Types of storage devices; Source Data Entry Devices — Definition , Digital Camera – Scanners- Voice Recognition System — Fax Machine- Microphone.

UNIT–3: MS-Word: Introduction – Features; Creating, editing, saving and printing text documents; Font and paragraph formatting; Simple text formatting, Finding and Replacing Text; Header and Footer; Inserting tables, smart art, page breaks; Using lists and styles; Working with images; Using Spelling and Grammar check; Mail Merge.

UNIT–4: MS-Excel: Introduction – Features; Creating, editing, saving and printing worksheets; Modifying worksheets with colour & auto formats; Range - Formatting Worksheet; Working with functions & formulas; Graphically representing data : Charts & Graphs; Built-in Functions.

UNIT–5: MS-Power Point: Introduction – Features; Creating Presentation - Viewing - Saving and Closing Presentation; Applying auto layouts; Changing Layout - Changing Designs - Slide Transition; Adding animation effects; Adding custom animation; Using slide transitions; Graphically representing data : Charts . Tables. PictLIres, Clipart, video & audio.

REFERENCES:

- Fundamentals of Information Technology. S.K.Bansal, A.P.H. Publishing company. New Delhi. 2002.
- 2007 Microsoft Office System step by step, Joyce Cox, Joan Preppernau, Steve Lambert and Curtis Frye, 2007.

Lab Exercises:

MS-Word: Preparation of Bio Data, Agenda, Minutes. Circular Letters. Letters to Various Sectors. Mail Merge. Designing a News Paper.

MS-Excel: Preparation of Payrolls, Invoice. Charts for Business Analysis. Use of Financial Functions.

MS-PowerPoint: Preparation of The Advertisement, Animation, Transition Effect Audio & Video Presentation.

LEARNING OUTCOME

- Recall the fundamental concept of computer with present level of knowledge of the students.
- Recognize the purpose of operating systems, programming languages and basic peripheral devices.
- Create document in MS-Word.
- Perform the statistical calculations and draw chart using MS-Excel.
- Design presentation using MS-PowerPoint

21SPOU0001- Sports and Games (0 + 2 Credits)

Course Objective:

To gain knowledge about the Sports and Games

Course Outcomes:

Students should be able to

- Explain the basic concepts of physical education
- Demonstrate skills in major games.
- Assess the fitness level
- Analyze basic skills involved in track and field events
- Outline the modern trends and development in Physical Education.

UNIT–1: Concept, meaning and Definition of Physical Education – Aims and Objectives of Physical Education - Scope of Physical Education.

UNIT–2: Concept of Fitness, aerobic and anaerobic exercises - practice of high and low intensity of aerobic and anaerobic exercises - procedure for Yo Yo fitness test.

UNIT–3: Basic skills of Indigenous games (Kabaddi and Kho-Kho) - Basic skills of any Two of the major games (Basketball, Football, Hockey and Volleyball) – any two events in Track and Field Events.

UNIT–4: Concept and meaning of Intramural and Extramural tournaments – Types of Tournaments - Methods to draw the fixture for knockout and league tournaments – Recreational activities (Minor games).

UNIT–5: Personal Hygiene – Safety education with special reference to playfield – Modern trends in Physical Education - Nutrition and Sports diet - Common athletic injuries and first-aid. Preparation of Physical Education record / album in the area of specialization of one of the major game and two track and field events is a must for each student.

Text Books:

1. Anderson “School Health Practice”.
2. Ashwani Bhardwaj, A Complete Guide to Family Safety and First-aid, Goodwill Publisher.
3. Bucher Charles A., (1983), Foundationas of Physical Education, St. Louis the C.V. Mosby Company.
4. Conling David,(1980), Atheletics, London, Robert Hale.
5. Elizabeth Anders, (July,2008), Field Hockey (Steps to Success)
6. Goswami Shashikant,(1996), Nutrition for sports, SAINSNIS, Patiala.
7. Hoeger W.K. Werner and Sharon A. (1990), Hoeger, Fitness and Welness : Mortor Publishing Company, Englewood.
8. Jan Galen Bishop, (2013), Fitness through Aerobics(9ED), Pearson Publishers, ISBN10:0321884523, ISBN 13:9780321884527
9. Kamalesh M.L., (1988), Physical Education: Facts and Foundation, New Delhi, P.B. Publication.
10. Ken O. Bosen Track & Field Fundamental Techniques NIS Publications, Patiala.
11. Kenneth H.Cooper, (1978), Aerobics, M Evans & Co Publishers.

12. Kenneth H.Cooper, (1982), Aerobics programme for total Wellbeing, NY, Bantam Books Publishers, ISBN 0-553-34677-6, ISB?N:978-0-307-77725-6.
13. National Club Games Rule Book Kho-Kho - Indian Olympic Association.
14. Park and Park "Preventive and social medicine"
15. Rule Book, (2014), 9 Provinces battling for the Indigenous Games champs trophy
16. Sanju Sira, (2016), First Aid Manual for Nurses.
17. The Step-by-Step Training Manual of Soccer Skills & Techniques: Hundreds of Training Tips and Techniques, with Easy-to-Follow Instructions in Over 750 Photographs and Diagrams, (Mar 2011), Anness Publishing Ltd (Creator).
18. Thiru. Narayanan C and & Harihara Sharma (1989), "Methods in Physical Education " Karaikudi CJ and S.H.
19. Thirunarayanan, C. and Hariharan, S., (1990), Analytical History of Physical Education, Karaikudi, C.T. & S.H., Publications.

References Books:

1. Joseph. P.M. "Organization of Physical Education".
2. Kamlesh, M.L., Management concepts physical education and sport Metropolitan Book Co., Pvt., Ltd., Nethaji Subhash Marg, New Delhi.
3. Singh M.K. Teaching Methods in Physical Education.

Web Resources:

1. https://www.iaaf.org/home
2. http://www.indiankabaddi.org/
3. http://khokhofederation.in/
4. https://www.olympic.org/the-ioc

21YOGV0001 - YOGA EDUCATION (0+2 credits)

Course Objective: To gain knowledge about the Yogic Practices

Course Outcomes:

Students should be able to

- Evaluate the importance of preparatory exercise.
- Demonstrate the suryanamaskar and various asanas.
- Utilize the meditation techniques.
- Compare mudras and bandhas
- Assess the difference between the asanas and physical exercises.

UNIT–1: History of Yoga - Definition of the term Yoga - Comprehensive Nature and Scope of Yoga- Aims and Objectives of Yoga - Various schools of Yoga - Yoga as an ideal system of physical culture.

UNIT–2: Schools of Yoga: Patanjaliyoga – Astangayoga – Tantrayoga – Mantrayoga – Hathayoga – Layayoga - Rajayoga – Jnanayoga – Bhaktiyoga – Karmayoga - Difference between practice of Asanas and Physical Exercise.

UNIT–3: Asanas Practice: Meditative Asanas: Sukhasana – Ardha Padmasana – Padmasana – Samasana - Vajrasana – Standing Asanas: Tadasana – Padahasthasana – Ardha cakrasana- Trikonasana- Parivrtta Trikonasana – Vrikshasana – Virabhadrasana- Utkatasana; Sitting Asanas: Baddha konasana – Janusirasana – Paschimottanasana – Ustrasana – Vakrasana - Gomukhasana – Akarna Dhanurasana – Utthita Padmasana - Upavistakonasana - Suryanamaskar.

UNIT–4: Asanas Practice: Prone Asanas: Makarasana – Bhujangasana – Shalabhasana – Dhanurasana – Naukasana – Niralambhasana – Supine Asanas: Pavanamuktasana – Sethubandhasana – Navasana – Sarvangasana – Halasana – Matsyasana – Savasana.

UNIT–5: Pranayama Practice: Sectional Breathing - Nadisuddhi – Bhramari – Bhastrika - Kapalabhati – Introduction to Bandhas – Mudras – Dharana (Trataka) – Dhyana.

REFERENCE BOOKS:

1. Asanas, Swami Kuvalayananda, Kaivalayadhama, Lonavla, 1993.
2. Light on Yoga, B.K.S Iyengar Harpine Collins Publication, New Delhi, 2000.
3. Sound Health Through Yoga, K.Chandrasekaran, Prem Kalyan Publications, Sedapatti, 1999.
4. Yoga For All, Maharishi Patanjali, Sahni Publications, 2003.
5. Yoga For Health, Institute of Naturopathy & Yogic Sciences, Bangalore, 2003.
6. Yoga for Health, K.Chandara Shekar, Khel Sahitya Kendra, Theni, 2003.
7. Yoga For the Morden Man, M.P.Pandit, Sterling Publishers Private Limited, New Delhi, 1987.
8. Yoga For You, Indira Devi, Jaico Publishing House, Chennai, 2002.

Web Resources

1. https://kdham.com/
2. http://www.biharyoga.net/

21FEMV0415 – EMPLOYABILITY SKILLS – (4 Credits)

OBJECTIVE:

- To teach verbal communication, non-verbal communication, listening, self awareness and behaviorial skill.
- To teach productivity about how well student combine resources to produce goods and series.
- To teach personality development and its related topics

UNIT–1: English literacy – Practice on greetings and introduction; Practice on office hospitality; Practice on telephone skills; Practice on role playing and group discussion; practice on job description; practice on job application and resume writing

UNIT–2: Productivity – Definition-productivity of land, materials, machine and men; necessity of productivity; benefits of productivity- categories of productivity benefits; productivity affecting factors- skills, working aids, automation, environment and motivation; personal finance management- Banking process, categories of consumer accounts, safe cash handling procedures, KYC registration, personal risk and insurance.

UNIT–3: Personality- Definition- Determinants - Personality Traits - Theories of Personality - Importance of personality Development. Self Awareness - Meaning - Benefits of self awareness - Developing self awareness. SWOT - Meaning - Importance - Application - Components. Goal Setting Meaning - Importance - Effective goal setting - Principle of goal setting - Goal setting at the right level.

UNIT–4: Team Building - Meaning - Types of teams - Importance of team building - Creating Effective Team. Leadership - Definition - Leadership Style - Theories of leadershipQualities of an Effective leader. Negotiation Skills - Meaning - Principles of Negotiation - Types of Negotiation - The Negotiation process - Common mistakes in Negotiation process. Conflict management - Definition - Types Conflict - Levels of Conflict - Levels of Conflict - Conflict Resolution - Conflict management.

UNIT–5: Social Graces - Meaning - Social Grace at work - Acquiring Social Graces . Table Manners - Meaning - Table Etiquettes in Multicultural Environment - Do's and Don'ts of Table Etiquettes. Dress Code - Meaning - Dress Code for Selected Occasions - Dress code for an Interview. Group Discussion - Meaning - Personality traits required for Group Discussing - Process of Group Discussion - Group Discussion topics. Interview - Definition - Types of Skills - Employer Expectations - Planning for the Interview - Interview - Interview questions - Critical Interview Questions.

REFERENCES:

1. Employability skills – Sep. 2016, Common for all trades, I Semester, Published by published by National Instructional Media Institute, Chennai
2. Employability skills – June 2016, Common for All Trades, II Semester, Published by published by National Instructional Media Institute, Chennai.
3. Dr. S. Narayana Rajan, Dr. B. Rajasekaran, G. Venkadasalapathi, V.Vijuresh Nayaham and Herald M. Dhas, Personality Development, Publication Division , Manonmaniam Sundaranar University, Tirunelveli, 2010.

LEARNING OUTCOME

- Students learn employability skills in the field of English literacy, productivity, environment education, labour welfare legislation and quality tools.

21FEMV0416 – REPAIR AND OVERHAULING OF ENGINE AND TRACTOR SYSTEM (14 Credits)

OBJECTIVES:

- To teach the procedure involved in servicing and overhauling of tractor engine / tractor transmission / hydraulic / electrical and control board system / tractor tyre and front axle.
- To teach common troubles, reasons and its remedies found in different tractor systems.
- To teach care and maintenance of tractor and its components.

Identify, use, maintain and store tools required for overhauling, adjustments, troubles, care and maintenance of the engine and tractor system

UNIT–1: Tractor diesel engine; fuel system and Ignition system

UNIT–2: Cooling system; Lubrication system and Governor System.

UNIT–3: Transmission system, tractor tyre and front axle.

UNIT–4: Steering and steering brake system; Hydraulic and hitching system; Electrical system.

UNIT–5: Accident and safety: Need for Personal Protection Equipment – selection, use, care and maintenance of respiratory and non-respiratory protective devices of the operator.

REFERENCES:

1. Mechanic Tractor, February 2016 Sector : Automobile, Common for Mechanic Tractor / Mechanic Agriculture Machinery, Trade: Practical, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Repair & Maintenance of Radiator, March 2011, Sector : Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
3. Repair & Overhauling of Tractor, October 2011, Sector : Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
4. Basic Tractor Servicing, March 2011, Sector : Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
5. A.K.Jain, 2006, Automobile Engineering, Vol.2; Published by Standard Publishers Distributors, 1705-B, Nai Sarak, Delhi – 110 006, ISBN: 81-86308-01-6
6. Er. Sanjay Kumar, 2007, A Text Book of Tractor at a glance (A unique book of farm power), Published by International Book Distributing Co., Lucknow 226 001 UP, ISBN: 81-8185-185-6

LEARNING OUTCOME

- Students learn servicing and overhauling of engine and tractor systems
- Student able to identify the faults and its remedies in engine and tractor systems

21FEMV0417 - INPLANT TRAINING–III (4 Credits)

OBJECTIVE:

To learn skills for specific job role from relevant Industry / Institution.

Students have to undergo four weeks training in any Tractor Manufacturing Industry / Training Institutes to acquire relevant skills. The in-plant training may be organized continuously for four weeks or more than one spell within a semester as per the convenience of the Industry/Institutes. During their stay in the industry, they have to maintain a diary on daily basis to record the work assigned, outcome of the work and it has to be countersigned by the student's in-charge. In addition, he/she has to submit weekly report to the department. During the in-plant training period, the Industry / Institute partner will evaluate their performance for 60 marks and the concerned course teacher for 40 marks as given below

INDUSTRY/ INSTITUTE

1	Attitude	10 marks
2	Punctuality	
3	Behavior	
4	Involvement	10 marks
5	Performance (completion of assigned work)	20 marks
6	Contribution to the industry	20 marks
	Total	**60 marks**

COURSE TEACHER

1	Diary /Record	10 marks
2	Weekly report	10 marks
3	Viva –voce	20 marks
	Total	**40 marks**

LEARNING OUTCOME

- Students able to learn the work culture from the concerned industry
- Students learn to handle special tools used in assembling and dismantling of machinery components.

FIFTH SEMESTER

21FEMV0518 – OPERATION AND MAINTENANCE OF POST HARVESTING EQUIPMENTS (4 Credits)

OBJECTIVES:

- To teach the operation and maintenance of selected post harvesting equipments
- To teach the adjustments needed for effective functioning of the equipments

UNIT–1: Introduction to post harvest technology of agricultural produce; Status of Production, Losses, Need, Scope and Importance - Introduction to various post harvest operations such as Primary Processing Operation Vs. Secondary Operation, Operations like Harvesting, Handling cleaning, grading, sorting, drying, storage, milling, size reduction, expelling, extraction, blending, heat treatment, separation, material handling (transportation, conveying, elevating),washing; their functions and use in the post harvest processing.

UNIT–II: Introduction, importance of drying, principles of drying and factors affecting drying, types of drying methods i.e. sun drying & artificial drying by mechanical means – Psychometric Chart, Moisture content representation, equilibrium moisture content, determination of moisture content by direct and indirect methods. - Drying Characteristics, Introduction to various grain drying systems - solar drying system, batch drying system, continuous flow drying system. Precautions during drying.

UNIT–III Introduction, need and importance, general principles of storage. Temperature and moisture changes during storage i.e. influence of moisture content, relative humidity, temperature, fungi etc. on stored product. -Fungi, insect and other organism / Infections associated with stored grains. - Familiarization with the various types of storage structures. Deep and shallow bins. Traditional and modem storage structures. Management of storage structures. Losses during storage and their control, space requirement of bag storage structure. - Types of material conveying Systems. Belt Conveyor, Bucket Elevator, Screw Conveyor,

UNIT IV: Function, suitability of crop, power requirement, labour requirement, components and capacity of Seed cleaner cum grader, Groundnut grader, Potato grader

UNIT–V: Function, suitability of crop, power requirement, labour requirement, components and capacity of Rectangular metal bin drier, Solar Tunnel Drier, Solar cabinet drier, Agricultural waste fired furnace drier. Function, suitability of crop, power requirement, labour requirement, components and capacity of Groundnut thresher, Pulse thresher, Mini dhal mill

REFERENCES

1. Repair, Maintenance & Operation of Post harvesting Equipments, March 2011, Sector : Agriculture for Modular Employable Skills, Developed by National Instructional Media Institute, Directorate General of Employment & Training, Ministry of Labour & Employment, Government of India, Chennai.
2. Directory of Rural Technologies, Vol.1, Farm & Post-harvest Equipment, 1986, Published by Council for Advancement of Rural Technology, New Delhi
3. Principles of Agricultural Processing, 1994, P.H.Pandey, Published by Kalyani Publishers, New Delhi
4. Bankable Post Harvest Equipment developed in India, 1986, R P Kachru, P K Srivastava, B S Bisht & T P Ojha, Published by CIAE, ICAR-Bhopal

LEARNING OUTCOME

- Student will able to learn the operation and maintenance of selected post harvesting machineries.
- To learn the adjustments needed for effective functioning of the machineries

21FEMV0519–OPERATION AND MAINTENANCE OF PUMPS FOR IRRIGATION (4 Credits)

OBJECTIVES

- To teach Operation and Maintenance of pumps used for irrigation.
- To teach the troubles occur in different pumps and its remedies.

UNIT–1: Pump – definition; Types of pumps – Centrifugal pump, Vertical turbine pump, Submersible pump, Propeller pump, Jet pump and Reciprocating pump; Comparative study of different pumps. Basic electrical and electronic terms

UNIT–2: Centrifugal pump – working principle, components and accessories; Installation operation and maintenance; trouble shooting in Centrifugal pump.

UNIT–3: Vertical turbine pumps – working principles**,** components and accessories; Installation operation and maintenance; trouble shooting in vertical pump

Unit 4 : Air compressor for lifting water from bore-wells – Important components; Working arrangement; Troubleshooting in air compressor.

UNIT–5 : Submersible pump – Components; Installation, Operation and Maintenance; Troubleshooting in Submersible pump. Accessories for electric motor pump set; Important terms and pump calculation; cost calculation of pumping.

REFERENCES

1. Fundamentals of Agricultural Engineering, 2016, by Er. Sanjay Kumar, Er. Vishal Kumar, Ram Kumar Sahu, Kalyani Publications, New Delhi – 110 002.

2. Elementa of Agricultural Engineering, 2013, By Dr. Jagdishwar Sahay, Standard Publishers Distributers, Delhi – 110 006.

LEARNING OUTCOME

- Student will able to learn the operation and maintenance of different pumps used for irrigation.
- Student will able to learn to rectify the troubles occur in different pumps

21FEMV0520 – OPERATION AND MAINTENANCE OF RENEWABLE ENERGY APPLIANCES
(4 Credits)

OBJECTIVES:

- To teach the various sources of renewable energy and their applications
- To attend minor repair & maintenance of solar gadgets and biogas plant

UNIT–1: Renewable energy – definition; comparison between conventional and renewable energy; solar energy, wind energy and biomass energy – merits and demerits.

UNIT–2: Solar cells- types- working pv cell- merits and demerits of pv cells- Solar applications – Solar cooker, solar water heater, solar dryer, solar distillation, solar lantern and solar water pumps – components and working principles; Repair & Maintenance of solar gadgets.

UNIT–3: Bio gas plants – Fixed dome type and Floating gas holder type – Construction details, operational parameters of a biogas plant; Repair and Maintenance of bio gas plants- bio mass-conversion of bio mass energy into other types

UNIT–4: Wind mill applications – pumping water, grinding grain and generation of electricity – classification of wind mill - horizontal axis rotor and vertical axis rotor.

UNIT–5: Gasifier – Classification of gasifier – up-draft, down-draft, cross – draft and fluidized bed gasifer; Components and functions; cooling and cleaning of producer gas; Recommended fuel size for different types of gasifiers.

REFERENCES:

1. Repair, Maintenance and operation of energy sources equipments, 2011, NIMI Publications, Chennai.

2. Er. Sanjay Kumar, Er. Vishal Kumar, Dr. Ram Kumar Sahu, 2012, Fundamentals of Agricultural Engineering, Published by Kalyani Publishers, Chennai, ISBN: 978-93-272-2168-8

LEARNING OUTCOME:

- Students learn the various sources of renewable energy and their application and limitations
- Students learn to handle the renewable energy gadgets

21FEMV0521 – OPERATION AND SAFETY MEASURES OF COMBINE HARVESTER (14 Credits)

OBJECTIVES:

- To teach the different components of combine harvester.
- To practice on driving combine harvester
- To learn repairs and maintenance of combine harvester

UNIT–1: Combine harvester – introduction – prime operational functions in combine; classification of combine harvester – pull type harvesting machine, pull type with auxiliary engine and self propelled harvesting combine.

UNIT–2: Constructional details of combine harvester – components of combine and their functions, factors to considered in choosing the type of combine harvester.

UNIT–3: Practice on field operative of combine harvester for paddy harvesting; operation and maintenance of balers.

UNIT–4: Calculation of grain losses and other parameters – collectable and non-collectable losses due to combine–Estimate the cost of operation of combine, power requirement and field capacity

UNIT–5: First-aid **–** Definition; purpose; key aims of first aid – preserve life, prevent further harm and promote recovery; golden hours in first aid; First-aid box; Important guidelines for first aiders. Safety precautions while starting, operating and stopping of combine harverster.

REFERENCES:

- Repair, Maintenance & Field Operation of Combine Harvester, March 2011, Published by NIMI Chennai.
- Jagadishwar Sahay, 2010. Elements of Agricultural Engineering**.** Standard Publishers Distributors, New Delhi. ISBN: 978 – 818040440

LEARNING OUTCOME

- Students learn to identify tools for maintenance of combine harvester.
- Students learn to adjust cutter bar, feeder, thresher, straw walker blower and augers depend on field conditions.
- Students learn to drive combine harvester.
- Students learn to calculate post harvest losses and cost of operation

21FEMV0522 - INPLANT TRAINING–IV (4 Credits)

OBJECTIVE:

To learn skills for specific job role from relevant Industry / Institution.

Students have to undergo four weeks training in any Harvester Manufacturing Industry / Training Institutes to acquire relevant skills. The in-plant training may be organized continuously for four weeks or more than one spell within a semester as per the convenience of the Industry/Institutes. During their stay in the industry, they have to maintain a diary on daily basis to record the work assigned, outcome of the work and it has to be countersigned by the student's in-charge. In addition, he/she has to submit weekly report to the department. During the in-plant training period, the Industry / Institute partner will evaluate their performance for 60 marks and the concerned course teacher for 40 marks as given below

INDUSTRY/ INSTITUTE

1	Attitude	10 marks
2	Punctuality	
3	Behavior	
4	Involvement	10 marks
5	Performance (completion of assigned work)	20 marks
6	Contribution to the industry	20 marks
	Total	**60 marks**

COURSE TEACHER

1	Diary /Record	10 marks
2	Weekly report	10 marks
3	Viva –voce	20 marks
	Total	**40 marks**

LEARNING OUTCOME

- Students able to learn the work culture from the concerned industry
- Students learn to handle special tools used in assembling and dismantling of machinery components.

SIXTH SEMESTER

21FEMV0623 – ENTREPRENEURSHIP DEVELOPMENT (4 Credits)

OBJECTIVE

- To develop and strengthen entrepreneurial quality and motivation among students.
- To impart basic entrepreneurial skills and understandings to run a business efficiently and effectively.

UNIT–1: Entrepreneurial Competence : Entrepreneurship concept – Entrepreneurship as a Career – Entrepreneurial Personality–Characteristics of Successful, Entrepreneur–Knowledge and Skills of Entrepreneur – Scope of the course in creating entrepreneurial opportunities and employment opportunities in public and private sectors – Scopes in competitive examinations.

UNIT–2: Entrepreneurial Environment: Business Environment – Role of Family and Society – Entrepreneurship Development Training and Other Support Organizational Services - Central and State Government Industrial Policies and Regulations - International Business.

UNIT–3: Business Plan Preparation: Sources of Product for Business - Prefeasibility Study - Criteria for Selection of Product - Ownership - Capital - Budgeting Project Profile Preparation - Matching Entrepreneur with the Project - Feasibility Report Preparation and Evaluation Criteria.

UNIT–4: Launching of Small Business: Finance and Human Resource Mobilization Operations Planning - Market and Channel Selection - Growth Strategies - Product Launching – Incubation, Venture capital, IT startups.

UNIT–5: Management of Small Business: Monitoring and Evaluation of Business - Preventing Sickness and Rehabilitation of Business Units – Effective Management of small Business.

TEXTBOOKS

1. Hisrich, Entrepreneurship, Tata McGraw Hill, New Delhi, 2001.
2. S.S.Khanka, Entrepreneurial Development, S.Chand and Company Limited, New Delhi, 2001.

REFERENCES

1. Mathew Manimala, Entrepreneurship Theory at the Crossroads, Paradigms & Praxis, Biztrantra, 2nd Edition ,2005
2. Prasanna Chandra, Projects – Planning, Analysis, Selection, Implementation and Reviews, Tata McGraw-Hill, 1996.
3. P.Saravanavel, Entrepreneurial Development, Ess Pee kay Publishing House, Chennai -1997.
4. Donald F Kuratko, T.V Rao. Entrepreneurship: A South Asian perspective. Cengage Learning. 2012

LEARNING OUTCOME

- Students will gain knowledge and skills needed to run a business.

21FEMV0624 – BOOK KEEPING (4 Credits)

OBJECTIVES:

- To teach basic concepts of Accounting for Business
- To teach the accounting practices and its techniques with special reference to Sole-Proprietorship, Trading and Non-Trading Concerns.

UNIT–1: Fundamentals of Accountancy, Meaning, Scope and Utility of Accounts, Methods of keeping Books of Accounts, Users of Accounts, Fundamental Accounting Equation, Types of Accounts, Rules of Debit and Credit, Types of Transactions, Types of Assets and Liabilities

UNIT–2: An introduction - Book- keeping Vs. Accounting - Relationship among Book-keeping, Accounting and Accountancy - Accounting Principles - Accounting Standards in India - Source documents - Double entry system - Transaction – Account - Approaches of recording transactions - Accounting rules - Journal entries

UNIT–3: Utilities of ledger - Format of ledger account - Distinction between journal and ledger - Procedure for posting - Balancing of ledger accounts - Need for preparing trial balance - Definition of trial balance - Features of trial balance - Objectives of preparing trial balance - Limitations of trial balance - cash book and its types

UNIT–4: Tally – fundamentals, Features, Startup, Screen Components, Mouse/ Keyboard functions, Screen Areas, Company Data, Creation / Altering Company in Tally.

UNIT–5: Hands-on-training and Practical Exercise

REFERENCES:

1. Accounting for Managers – J. Made Gowda – Himalaya Publishing House, 2015
2. Financial Management, I.M.Pandey,
3. Financial Management, Texts and cases, 2014.
4. Financial Accounting by Dr. Malleswari, 7th Edition, 2016. Himalaya Publishing House

LEARNING OUTCOME

- The student will gain knowledge about the basics of book keeping,
- The students able to prepare balance sheets and analysis of financial statements

21FEMV0625 – AGRI BUSINESS AND PROJECT MANAGEMENT (4 Credits)

OBJECTIVE:

- To teach special features of agri business and its importance in Indian economy

UNIT–1: Agribusiness : Agribusiness – Definition – Structure of Agribusiness (input, farm and product sectors), Agribusiness Management - Special features of Agribusiness - Importance of Agribusiness in Indian Economy. Project management in agribusiness - planning and budgeding, timeline management, risk management, market analysis, supply chain management.

UNIT–2: Introduction to Principles of Management : Management functions — planning, organizing — departmentation, forms of agri business organization - staffing, directing, supervision and motivation, controlling — types, performance. evaluation and control techniques.

UNIT–4: Production and Personal Management : Functional areas of agri business — production and operations management — functions, planning, physical facilities and managing quality. Inventory management—raw material procurement, inventory types, costs. Personnel management.

UNIT–4: Marketing Management : Marketing management — marketing environment, marketing mix. Pricing – objectives – determinants – types and polices.

UNIT–5: Input Marketing, Distribution: Input marketing firms-types and distribution channels. Processing firms-types, size and managerial problems. Management Information System (MIS) — concept and applications. Business standards business - Intellectual property rights and patenting – Government policies for agri business.

REFERENCES

1. Prasad, L.M, 2005, 'Principles and Practices of Management', Sultan Chand and Sons Educational Publishers, New Delhi.
2. Richard, B Chase, Nicholas J., Acquilano and F.Robert Jacobs, 2007, `Production and Operations Management - Manufacturing and service, Tata McGraw Hill Publishing Company Limited, New Delhi.
3. Aswathappa, K, Human Resource Management: Text and Cases, Tata McGraw-Hill Pub. Co. Ltd. New Delhi, 5th Edition, 2008.
4. Philip Kotler, Marketing Management, Pearson Education, India, 2003.
5. Chandra Prasanna. 2000. Financial Management - Theory and Practice. Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
6. R.K.Sapru, Project Management, Excel Books, New Delhi, 1997.
7. Broadway, A.C. (2003). Text Book of Agri Business Management, Atlas Books and Periodicals, New Delhi.
8. Kapur, S.K. (1994). Principles and Practice of Management, S.K. Publishers, New Delhi.
9. Prasad, L.M. (1993). Principles and Practice of Management, Sultan Chand & Sons, New Delhi.

LEARNING OUTCOME

- The students able to start a suitable agri business enterprises

21FEMV0626 – FUNCTION AND MANAGEMENT OF AGRO SERVICE CENTRE (14 Credits)

OBJECTIVE:

- Students will be trained in Agro Service Centre and make them to understand the functions and management of the centre

Students will undergo one month training in any established tractor / any agricultural machinery/ Irrigation machinery dealer and prepare a case study report which will cover the following items.

UNIT–1: Select and order right machinery and equipments by prior consultation. Maintenance and repairs, technical support, spare parts and assessories, equipment rental and machinery marketing.

UNIT–2: Identify and select vendors for purchase of farm machineries & equipments. Online platforms, local dealerships, government initiatives.

UNIT–3: Monitor the operations on a daily basis and evaluate success or failure of business

UNIT–4: Stock spare parts for different machinery parts and prime movers. Criticality of the equipment, frequency of failures, lead times, cost of down time and storage costs.

UNIT–5: Supervise minor repair and maintenance of farm machineries and implements

LEARNING OUTCOME

- Students learn to develop a sustainable model of Agro Service Centre

EVALUATION METHOD:

Dealer / Service Centre

1	Attitude	10 marks
2	Punctuality	
3	Behavior	
4	Involvement	10 marks
5	Performance (completion of assigned work)	20 marks
6	Contribution to the industry	20 marks
	Total	**60 marks**

Course Teacher

1	Diary /Record	10 marks
2	Weekly report	10 marks
3	Viva –voce	20 marks
	Total	**40 marks**

21FEMV0627 – PROJECT WORK (4 Credits)

The project work will be in one of the following themes:

i. A new innovation or critical study related to the technology or development dimensions envisaged by the course

ii. Preparation of an innovative enterprise for one's future career

iii. Carrying out a regional development/employment development project planning exercise within the spirit of the course

iv. Finding out a innovative project with analysis suitable for the specific area.

Project work will be carried out by a group of students, minimum 2 and maximum 5 out of 100 marks, the evaluation of 60 marks will be awarded by project guide based on students performance during project period and 40 marks will be awarded jointly by project guide and course coordinator based on final viva and students project presentation.