Integral University, Lucknow

Effective from Session: 2025-2026							
Course Code	AG138	**Title of the Course**	*Deeksharambh* (Induction-cum-Foundation Course)-Non gradial	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	**0**	**0**	**2**	**2**
Course Objectives	1. Helping students from different backgrounds for cultural Integration 2. Knowing about the operational framework of academic process in university and Instilling life and social skills, leadership qualities, team working spirit. 3. Developing social awareness, ethics and values, creativity						

Course Outcomes	
CO1	Understand the university's academic and research framework through direct interactions with faculty and administrators.
CO2	Develop awareness of the subject area, traditional values, indigenous knowledge systems, and global perspectives.
CO3	Gain exposure to real-world success stories through interaction with alumni, employers, and domain experts.
CO4	Identify personal strengths and weaknesses through group activities and peer learning with expert guidance and Enhance personality, communication, and leadership skills through structured sessions on life skills and ethics.

Detailed Activity

i. Discussions on operational framework of academic process in the University, as well as interactions with academic and research managers of the University

ii. Interaction with alumni, business leaders, perspective employers, outstanding achievers in related fields, and people with inspiring life experiences

iii. Group activities to identify the strength and weakness of students (with expert advice for their improvement) as well as to create a platform for students to learn from each other's life experiences

iv. Activities to enhance cultural Integration of students from different backgrounds.

v. Field visits to related fields/ establishments

vi. Sessions on personality development (instilling life and social skills, social awareness, ethics and values, team work, leadership, etc.) and communication skills

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1											2			3							
CO2											2			3							
CO3											2			3							
CO4											2			3							
CO5											2			3							
CO6											2			3							

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-2026							
Course Code	AG151	**Title of the Course**	Crop Production and Protection Technologies	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	**3**	**0**	**1**	**4**
Course Objectives	To enable the students to have basic idea on crop production and protection practices to understand the domain of agricultural sciences and to have an idea of the different types of machineries/ equipment that can be adopted for these operations						

Course Outcomes	
Students will be able to	
CO 1	Understand agronomic principles in context to different agro-climatic conditions
CO 2	Assess the relationship between soil, water, and plants for enhancing productivity.
CO 3	Understand soil nutrient dynamics, problematic soils and recommend appropriate soil management and reclamation practices for different soil conditions.
CO 4	Analyze plant nutrients for sustainable crop production.
CO 5	Build skills in horticultural crop production management including propagation, orchard, input, pest and disease control measures.
CO 6	Identify major crops, varieties, seeds, weeds, rocks, minerals, and horticultural plants; perform key soil and plant analysis techniques; apply fertilizer and weed control methods; assess crop maturity and seed viability; and demonstrate practical skills in nursery management, pruning, training, and protected cultivation technologies relevant to agricultural and horticultural practices.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Unit 1**	Introduction and scope of agronomy; Classification of crops; Effect of different weather parameters on crop growth and development; Principles of tillage, tilth and its characteristics; Crop seasons; Time and method of sowing of major field crops, seed rate for important crops; Methods and time of application of manures and fertilizers, fertigation; Basic principles of natural farming, organic farming and sustainable agriculture.	7	CO 1
2	**Unit 2**	Soil-water-plant relationship, crop coefficients, water requirement of crops and critical stages for irrigation; Weeds and their management in crops; Crop rotation, cropping systems, cropping scheme, relay cropping, mixed cropping and intercropping.	8	CO 2
3	**Unit 3**	Soil forming processes; Classification and composition of soil, soil taxonomy orders; Important soil physical properties and their importance; soil particle distribution; soil inorganic colloids– their composition, properties and origin of charge; ion exchange in soil and nutrient availability; soil organic matter– its composition and decomposition, effect on soil fertility; Soil reaction – acidic, saline and sodic soils; Quality of irrigation water.	8	CO 3
4	**Unit 4**	Essential plants nutrients- their functions and deficiency symptoms in plants; Important inorganic fertilizers and their reactions in soils; Gypsum requirement for reclamation of sodic soils and neutralizing RSC; Liquid fertilizers and their solubility and compatibility.	6	CO 4
5	**Unit 5**	Types of horticultural crops; Sowing and planting times and methods; Seed rate and seed treatment for vegetable crops; Macro and micro propagation methods; Types of plant growing structures; Pruning and training; Water requirements and critical stages; Management of orchard; Major pests and diseases of horticultural crops and their management.	7	CO 5
Practical				
Identification of crops and their varieties, seeds and weeds; Study of different fertilizer application methods and weed control methods; Judging the maturity time for harvesting of crop; Study of seed viability and germination test; Identification of rocks and minerals; Examination of soil profile in the field; Determination of bulk density; particle density and porosity of soil; Determination of organic carbon of soil; Identification of nutrient deficiency symptoms of crops in the field; Determination of gypsum requirement of sodic soils; Identification and description of important fruits, flowers and vegetables crops; Study of different garden tools; Preparation of nursery bed; Practices of pruning and training in some important fruit crops; Study of cultural operations for vegetable crops (sowing, fertilizer application, mulching, irrigation and weed control); Seed extraction techniques; Visit to commercial greenhouse/ polyhouse.		**30**	CO 6

Reference Books:

1. Ahamad S, Anwar Ali and Sharma P K (Eds). 2018. Plant Disease Management in Horticultural Crops. Daya Publishing House, Delhi.
2. Biswas T D and Mukharjee S K. 1987. A Text Book of Soil Science. Tata McGraw-Hill publishing Co. Ltd.
3. Brady N C and Ray R Weill. 2002. The Nature and Properties of Soil. Pearson Education Inc. New Delhi.
4. Chadha K L. 2003. Handbook of Horticulture. ICAR Publication, New Delhi.
5. Das D K. 2020. Introductory to Soil Science. Kalyani publication, Ludhiana.
6. Dey G C. 2013. Fundamentals of Agronomy. Jain Book Depot.
7. Ghildyal B P and Tripathy R P. 1987. Soil Physics. Wiley Eastern Ltd., New Delhi.
8. Hillel D. 1982. Introduction to Soil Physics. Academic Press, New York.
9. Indian Society of soil science. 2002. Fundamentals of Soil Science. ISSC, IARI, New Delhi.

e-Learning Source:

https://www.fao.org/4/y9870e/y9870e07.htm

http://www.agritech.tnau.ac.in/

https://www.slideshare.net/slideshow/agro246full-notesagrounderpdf-crop-production-technology-rabi/267717316

Integral University, Lucknow

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	1	1	2	1	1	3	3	3	3	3	3	2	1	3	3	1	1	1	2	1
CO2	3	3	3	2	1	1	2	3	2	2	3	3	2	3	2	2	2	3	3	2	1
CO3	3	3	3	2	1	1	2	2	2	3	3	3	1	2	2	2	1	3	3	2	1
CO4	3	3	3	2	1	1	3	3	3	3	3	3	2	2	2	2	1	3	3	2	1
CO5	3	1	1	2	1	1	3	3	3	3	3	3	2	2	2	2	1	1	1	2	1
CO6	3	3	3	2	2	1	2	3	2	2	3	3	2	3	1	2	2	3	3	1	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	AE121	**Title of the Course**	Introduction to Agricultural Engineering	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	**3**	**0**	**1**	**4**
Course Objectives	To enable the students to have basic idea on different agricultural engineering applications and the machinery involved in different farm operations, post-harvest and allied activities						

Course Outcomes	
Students will be able to	
CO1	Understand the scope, importance, and various fields of Agricultural Engineering and identify career opportunities and research areas in the domain.
CO2	Demonstrate knowledge of different types of farm machinery and equipment used in tillage, sowing, fertilization, plant protection, harvesting, and post-harvest operations.
CO3	Explain the working principles of tractors, power tillers, and renewable energy systems (biogas, solar, wind) used in agriculture.
CO4	Apply basic concepts of soil and water conservation, irrigation methods, and drainage planning using appropriate tools and structures.
CO5	Acquire practical knowledge and skills in handling and understanding farm machinery, renewable energy systems, irrigation technologies, post-harvest operations, and food processing equipment. They will also gain exposure to modern agricultural practices through field visits to mechanized farms, greenhouses, watershed projects, and agro-industrial units, enhancing their competence in farm mechanization and value addition.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Unit 1**	Agricultural Engineering as a discipline; Major divisions of Agricultural Engineering; Importance of Agricultural Engineering for today's agriculture; Different sectors of employment for Agricultural Engineers; Scope of research and higher studies in Agricultural Engineering in India and abroad. Farm mechanization needs and strategy; Classification of farm machinery on the basis of unit operations; Principles of selection of machinery for different sizes of land and matching power sources; Different types of equipment for tillage, sowing, planting and transplanting, fertilizer application, weed control, plant protection; Harvesting and threshing equipment for rice, wheat, maize, cotton, sugarcane, fruits, tuber crops and other locally important crops..	12	1
2	**Unit 2**	Functions and capabilities of tractor and power tillers; Introduction to the IC engine systems, fuel and air supply systems, cooling and lubricating systems, and electrical systems in a tractor; Basic parts of a power tiller; Hitching system. Introduction to renewable energy systems; Types of biogas plants, Types of solar energy collectors; Solar water heating systems, solar dryers, solar photovoltaic systems; Wind mills and their different parts. Importance of soil and water conservation; Different agronomic measures for control of water erosion, mixed cropping, crop rotation, tillage practices, mulching; Different engineering measures; gully control measures. Use of topographical survey and contour maps. Different types of water harvesting structures	11	2
3	**Unit 3**	Introduction to soil-plant-water relationship; Equipment for measurement of irrigation water, viz. weirs, notches, orifices and mouth pieces; Introduction to different surface irrigation methods as border, furrow and check basin, sprinkler, drip irrigation and their different components; Underground water conveyance methods in pipes; Introduction to planning of drainage systems; Introduction to centrifugal pumps and different components. Different types of agricultural structures; Introduction to planning and layout of farmsteads, animal houses, poultry houses; Different types of grain storage structures; Greenhouse and its different parts; Low cost protected structures.	11	3
4	**Unit 4**	Classification of different types of agricultural commodities as durables, perishables, etc.; Moisture content and its importance in grain storage; Common reasons of food spoilage, food preservation methods; Different primary processing operations and their necessity; Methods and equipment used for cleaning, washing, sorting, grading, peeling, size reduction; Different types of traditional and modern storage structures; Storage of perishable commodities; Different types of packaging materials and their suitability for various food products; Basic principles of value addition of food as drying and dehydration, evaporation, thermal processing, refrigerated and frozen storage, chemical preservation and other novel methods.	11	4
Practical				
		Study of various implements (tillage, sowing, planting, weeding, fertilizer application); Study of farm implements (pesticide application, harvesting and threshing); Study of various components of tractor and matching implements; Study of various components of power tiller and matching implements; Study of various types of biogas plants and operational parameters; Study of various solar energy application systems; Study on various components of sprinkler and drip irrigation; Study on various components centrifugal pump; Study of various post-harvest operations; Study of different food processing equipment; Value addition of common crops; Visit to a greenhouse with modern irrigation system; Visit to implement manufacturing unit; Visit to a mechanized farm; Visit to a watershed; Visit to a food processing industry.	30	CO 5

Reference Books:

- Chakraverty A. 1999. Post Harvest Technology of Cereals, Pulses and Oilseeds. Oxford & IBH publishing Co. Ltd., New Delhi.
- Dash S K, Bebartta J P and Kar. 2012. A. Rice Processing and Allied Operations. Kalyani Publishers, New Delhi.
- Jain S C and Philip G. 2009. Farm Machinery - An Approach. Second Edition. Standard Publishers and Distributors, New Delhi.
- Mal B C. 2014. Introduction to Soil and Water Conservation Engineering. 2014. Kalyani Publishers.
- Michael A M and Ojha T P. 2003. Principles of Agricultural Engineering. Jain Brothers, New Delhi. Michael A M. 2012. Irrigation: Theory and Practice. Vikas Publishing House New Delhi
- Nakra C P. 1980. Farm Machines and Equipment. Dhanpat Rai Publishing Company Pvt. Ltd, New Delhi.
- Suresh R and Kumar Sanjay. 2018. Farm Power and Machinery Engineering. Standard Publisher Distributors, New Delhi.
- Suresh R. 2014. Soil and Water Conservation Engineering. Standard Publisher Distributors, New Delhi.

e-Learning Source:

https://elearning.icar.gov.in/eLearningCoursesLibrary.aspx?CoursesType=UG

Integral University, Lucknow

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	3	3	2	3	2	3	2	3	3	3	3	3	2	3	3	2	3	1
CO2	3	3	2	2	1	2	2	2	3	3	1	2	2	3	3	2	3	2	3	2	2
CO3	2	3	1	3	2	3	3	3	2	3	2	3	3	2	2	2	2	3	3	2	3
CO4	3	2	3	3	3	2	3	2	1	2	3	3	1	2	3	3	3	3	2	3	2
CO5	3	3	3	3	3	2	2	3	3	1	3	2	3	3	2	3	2	2	1	3	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	AE122	**Title of the Course**	Surveying and Levelling	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	**1**	0	**2**	**3**
Course Objectives	To enable the students to conduct the survey work for any area and also to prepare layout of engineering structures						

Course Outcomes	
Students will be able to	
CO1	Apply basic surveying principles using chain, cross staff, & compass method.
CO2	Identify the correct surveying errors to improve measurement accuracy.
CO3	Perform levelling & contour mapping to calculate land areas & volumes as well as handle traditional instruments for field survey.
CO4	Demonstrate the use of total station & GPS for data collection & mapping tasks.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Unit 1**	Surveying: introduction, classification and basic principles; Linear measurements, chain surveying, cross staff survey, compass survey, planimeter;	8	1
2	**Unit 2**	Errors in measurements, their elimination and correction; Plane table surveying, methods, advantages and disadvantages.	9	2
3	**Unit 3**	Levelling, levelling difficulties and error in levelling, contouring, computation of area and volume. Theodolite traversing, introduction to setting of curves; Total station, electronic theodolite; Introduction to GPS survey.	9	3
Practical				
Linear measurements using different instruments; Reconnaissance survey in the field; Use of field book; Study on various types of chain used in chain survey and its components; Study of errors in chain surveying; Use of ranging rods and ranging in the field; Obstacles during chaining; Offsets in chain survey; Cross Staff; Survey of an area; Preparation of map; Study on various types of compass; Compass survey of an area; Plotting of compass survey; Plane table surveying and different methods; Study on various types of levels and its components; Setting up of dumpy level in the f ield; Computation of various methods for RL; Study on Levelling, L section and X sections and its plotting; Measurement of slope in the field; Study on contour and its characteristics; Contour survey of an area and preparation of contour map; Introduction of software in drawing contour; T heodolite surveying; Ranging by Theodolite; Height of object by using Theodolite; Setting out curves by Theodolite; Use of minor instruments; Use of total station, EDM in the field; Use of modern computers for surveying.		**60**	CO 4

Reference Books:

- Agor R. A Text Book of Surveying & Levelling. Khanna Publishers, New Delhi
- Punmia B C. 1987. Surveying (Vol. I). Laxmi Publications, New Delhi.
- Kanetkar T P. 1993. Surveying and Levelling. Pune Vidyarthi Griha, Prakashan, Pune.

e-Learning Source:

https://elearning.icar.gov.in/eLearningCoursesLibrary.aspx?CoursesType=UG

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																			
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	3	3	2	3	2	3	2	3	2	3	3	3	2	3	3	2	2	3
CO2	3	3	2	2	1	2	2	2	3	3	1	2	2	3	3	2	3	2	3	2	2
CO3	2	3	1	3	2	3	3	3	2	3	2	3	3	2	2	2	2	3	3	2	3
CO4	3	2	3	3	3	2	3	2	1	2	3	3	1	2	3	3	3	3	2	3	2
CO5	3	3	3	3	3	2	2	3	3	1	3	2	3	2	2	3	2	3	1	2	2

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	ME107	**Title of the Course**	**Workshop Technology and Practice**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	**0**	0	**2**	**2**
Course Objectives	To expose the students to basic manufacturing processes involved for production of different machine elements and to facilitate hands-on experience of using these machines						

Course Outcomes	
Students will be able to	
CO1	Demonstrate the use of hand tools and measuring instruments in fitting and carpentry shops.
CO2	Perform basic fitting operations viz. sawing, filing, drilling and tapping with accuracy.
CO3	Execute carpentry joints using appropriate tools.
CO4	Operate arc and gas welding equipment to perform common welding joints and conduct gear cutting operations with precision.

Unit No.	**Title of the Unit**	**Practical**	**Contact Hrs.**	**Mapped CO**
1	**Unit 1**	Introduction about different shops in the workshop; Safety and precautions to be taken in the workshop; Study of different tools used for fitting and different fitting operations; Study of various measuring instruments used for fitting; Exercise in fitting: sawing, filing and right angle fitting of MS flat; Working with complex fitting jobs: operations of drilling, reaming, and threading and with tap dies	8	1
2	**Unit 2**	Preparation of a paper weight; Study of various carpentry tools, types of wood and their characteristics and working with carpentry tools; Preparation of simple joints in carpentry: cross half lap joint or T-half joint, Mortise and Tenon joint in carpentry; Preparation of dovetail joint in carpentry; Study of welding, types of welding, oxyacetylene gas welding, types of flames, welding techniques and equipment used for gas welding, working with welding equipment	8	2
3	**Unit 3**	Working with electric arc welding; Equipment and tools, safety and precautions taken in arc welding; Preparation of Butt joint and lap joint with ARC welding; Preparation of Lap and butt joints using gas welding; Working on a lathe machine and study of different tools used in lathe machine; Exercise on simple turning, step turning in lathe machine; Preparation of job on taper turning, drilling, knurling and threading in lathe machine; Working with different machines in machine shop such as shaper, milling machine, etc. and with different tools used in machine shop	8	3
4	**Unit 4**	Exercise on bending, shaping etc.; Exercise on Drawing, Punching, Riveting; Making different types of sheet metal joints using G.I. sheets; Practice job on shaper; changing a round MS rod into square section with a shaper; Exercise on a milling machine such as making a slot, gear tooth forming and indexing	8	4

Reference Books:

- Chapman W A J. 2018. Workshop Technology (Vol. I and II). Arnold Publishers (India) Pvt. Ltd., AB/9, Safdarjung Enclave, New Delhi.
- Hajra Choudhury S K, Roy N, Hajra Choudhury A K. 2017. Elements of Workshop Technology (Vol. I and II). Media Promoters and Publishers Pvt. Ltd, Mumbai.
- Khurmi R S and Gupta J K. 2018. A Text Book of Workshop Technology. S. Chand & Company Ltd, New Delhi.
- Raghuwansi B S. 2016. A Course in Workshop Technology (Vol. I and II). Dhanpat Rai and Sons, 1682, Nai Sarak, New Delhi

e-Learning Source:

https://elearning.icar.gov.in/eLearningCoursesLibrary.aspx?CoursesType=UG

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	1	2	3	2	2	2	1	1	2	1	3	2	2	3	2	1	3	1	2	2	2
CO2	2	3	2	2	1	2	2	2	3	3	1	2	2	3	3	2	3	2	3	2	2
CO3	2	3	1	3	1	3	3	3	2	3	2	3	3	2	2	2	2	3	3	2	2
CO4	3	2	3	3	3	2	3	2	1	2	3	3	1	2	3	3	3	3	2	3	1
CO5	2	2	1	2	2	2	2	3	3	1	3	2	3	2	2	3	3	3	2	3	3

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	EE101	**Title of the Course**	Basic Electrical Gadgets and Instruments	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	**2**	0	**2**	**3**
Course Objectives	1. To provide students with a comprehensive understanding of the fundamental concepts of electrical engineering and electronics relevant to agricultural applications. 2. The course aims to familiarize students with single-phase and three-phase AC circuits, semiconductor devices, digital electronics, and measurement instruments used in agricultural engineering and related fields.						

Course Outcomes	
Students will be able to	
CO1	Understand the principles of single-phase and three-phase AC circuits and analyze various electrical circuits (RL, RC, RLC) in series and parallel configurations including resonance phenomena, Q-factor, and bandwidth.
CO2	Differentiate between AC and DC supply systems and identify suitable applications of electrical appliances used in agricultural structures and operations.
CO3	Demonstrate knowledge of semiconductor devices such as diodes, zener diodes, and transistors along with their applications in rectification, clipping, clamping, regulation, and amplification. Apply operational amplifiers (OP-AMPs) for solving linear and non-linear circuit problems including adder, subtractor, integrator, comparator, and active rectifiers.
CO4	Understand the basics of digital electronics, including logic gates, Boolean algebra, combinational circuits, and binary arithmetic.
CO5	Use various electrical and electronic instruments to measure physical parameters such as displacement, temperature, pressure, force, and velocity with devices like thermocouples, LVDTs, RTDs, and anemometers.
CO6	Perform basic electrical wiring, troubleshoot and repair common electrical appliances and UPS systems, measure electrical parameters in single and three-phase circuits, and operate key instruments for agricultural and industrial applications. They will also develop skills in building and analyzing electronic circuits, using sensors and transducers to measure physical parameters such as displacement, pressure, temperature, and speed, and gain hands-on experience with instrumentation tools used in agriculture and food processing systems.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Single- phase AC circuit	Introduction to different electrical appliances used in agricultural buildings, structures and farm .0operations; Difference between AC and DC supply system; Introduction to AC fundamentals; AC through series RL, RC, and RLC circuits, parallel AC circuit, series and parallel resonance; Q-factor and bandwidth.	8	CO 1
2	Three- phase AC circuit	Concept of balanced three-phase AC circuits, line and phase quantity in star and delta network, power in three-phase circuit, various methods of three phase power measurement like (one wattmeter and two – wattmeter method)	8	CO 2
3	Semiconductor Devices and its application	Diode and its applications: Rectifier, Clipper, Clamper, voltage multiplier and capacitive filter zener diode as voltage regulator. Transistor and its applications: Bipolar junction transistor, operating point. Various biasing methods, fixed, self biasing and potential divider biasing method; OP-AMP, Ideal OP-AMP characteristics, Linear and non-linear applications of OP-AMP (adder, subtractor, integrator, active rectifier, comparator).	8	CO 3
4	Fundamentals of Digital Electronics	Introduction to digital electronics and logic gates: Basic theorem of Boolean algebra, combinational logic circuits (basic gates, SOP rule and K-map), binary adder.	8	CO 4
5	Measurement and Instrumentation	Principles of general instruments, measurement of displacement, temperature, velocity, force and pressure using different instruments like strain gauges, load cell, thermistors, thermocouples, pyrometer, linear variable differential transformer (LVDT), capacitive transducers, RTD, instruments for measurement of speed, wind velocity, solar radiation, anemometer, multimeter, etc.	8	CO 5
Practical				
Electrical: To prepare an electrical switch board to control two light points, one plug point, one fan point and fuse (House wiring); To prepare an electrical switch board to control two light points using two two-way switch (staircase wiring); To connect and test a fluorescent lamp; To find faults and repair home appliances such as heater, electric iron, fans and mixer-grinder, etc.; To find faults and repair UPS; To measure the power requirement and power factor in a AC single phase series RLC circuit; To measure energy of a single phase AC circuit with the help of ammeter, voltmeter and power factor meter and energy meter; To measure the power consumption in a three-phase circuit using two-wattmeter method. **Instrumentation:** To prepare a DC power supply unit using diode and filter circuit; To study the Zener diode as voltage regulator circuit; To study transistor characteristics in CE configurations; To verify different logic gates; To measure unknown resistance using Wheatstone bridge; To measure the displacement and to determine the characteristics of LVDT; To measure the displacement using LVDT and potentiometer; To measure the pressure using strain gauge and Bourdentube; To measure the temperature using RTD, thermistors and thermocouple and study their characteristics; To measure the speed, wind velocity, solar radiation etc, using different measuring tools like tachometer, anemometer, pyranometer, multimeter, etc.; To acquaint with different other types of instruments used in agriculture and food processing applications.			**60**	CO 6

Reference Books:

- Kothari D.P. and Nagrath I.J. 2010. Basic Electrical Engineering. Tata McGraw-Hill Education.
- Mehta V.K. and Mehta Rohit. 2017. **Principles of Electrical Engineering and Electronics**. S. Chand Publishing.
- Boylestad Robert L. and Nashelsky Louis. 2009. **Electronic Devices and Circuit Theory**. Pearson Education.
- Millman Jacob and Halkias Christos C. 2001. **Integrated Electronics: Analog and Digital Circuits and Systems**. Tata McGraw-Hill.
- Gayakwad Ramakant A. 2013. **Op-Amps and Linear Integrated Circuits**. Pearson Education India.
- Roy Choudhury D. and Jain Shail B. 2003. **Linear Integrated Circuits**. New Age International Publishers.
- Mano M. Morris. 2005. **Digital Logic and Computer Design**. Pearson Education.
- Sawhney A.K. 2015. **Electrical and Electronic Measurements and Instrumentation**. Dhanpat Rai & Co.

Integral University, Lucknow

e-Learning Source:
https://archive.nptel.ac.in/courses/108/105/108105153/
https://archive.nptel.ac.in/courses/113/106/113106065/

								Course Articulation Matrix: (Mapping of COs with POs and PSOs)												
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	2	-	-	-	2	-	-	-	2	2	3	3	2	3	2	1	-	2
CO2	3	2	2	2	-	1	-	-	-	-	-	2	-	2	2	1	3	2	2	1	3
CO3	3	3	3	2	2	-	-	-	-	-	-	2	2	1	3	2	3	1	-	2	-
CO4	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2	2	2	3	2	1	2
CO5	3	2	3	2	3	-	-	-	-	-	-	2	2	2	3	2	3	2	3	2	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	CA172	**Title of the Course**	Agricultural Informatics and Artificial Intelligence	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	2	0	1	**1**
Course Objectives	1. To acquaint students with the basics of computer applications in agriculture, multimedia, database management, application of mobile app and decision- making processes, etc. 2. To provide basic knowledge of computer with applications in Agriculture and to make the students familiar with Agricultural-Informatics, its components and applications in agriculture						

Course Outcomes	
Students will be able to	
CO1	Understand the fundamentals of computers and operating systems, and demonstrate proficiency in using MS Office and database management systems for agricultural data handling, presentation, and analysis.
CO2	Understand the fundamentals of computers and operating systems, and demonstrate proficiency in using MS Office and database management systems for agricultural data handling, presentation, and analysis.
CO3	Use IT tools and mobile applications for managing crop water and nutrient needs, accessing agricultural advisories, and employing geospatial technology to generate location-specific agricultural information.
CO4	Design and apply decision support systems and expert systems for farm-level decision-making, and evaluate digital initiatives and AI-driven strategies for enhancing agricultural planning and productivity
CO5	Explain the concepts of IoT and Big Data, and analyze the role of artificial intelligence in advancing smart agriculture, livestock monitoring, crop management, and food processing technologies.
CO6	Develop hands-on skills in operating systems, file management, and the use of MS Office tools for scientific documentation and data analysis. They will learn to create and manage databases using MS Access, apply programming basics, operate crop simulation models (CSM), and use ICT tools and geospatial technologies for agro-advisory services, decision support systems, and digital agriculture applications, including the India Digital Ecosystem of Agriculture (IDEA).

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Unit 1**	Introduction to Computers, Anatomy of Computers, Memory Concepts, Units of Memory, Operating System: Definition and types, Applications of MS-Office for creating, Editing and Formatting a document, Data presentation, Tabulation and graph creation, Statistical analysis, Mathematical expressions, Database, concepts and types, creating database, Uses of DBMS in Agriculture, Internet and World Wide Web (www):	8	1
2	**Unit 2**	Concepts and components. Computer programming: General concepts, Introduction to Visual Basic, Java, Fortran, C/ C++, etc. concepts and standard input/output operations. e-Agriculture, Concepts, design and development; Application of innovative ways to use information and communication technologies (IT) in Agriculture; Computer Models in Agriculture: Statistical, weather analysis and crop simulation models, concepts, structure, inputs outputs files, limitation, advantages and application of models for understanding plant processes, sensitivity, verification, calibration and validation;	8	2
3	**Unit 3**	IT applications for computation of water and nutrient requirement of crops; Computer-controlled devices (automated systems) for Agri-input management; Smartphone mobile apps in agriculture for farm advice: Market price, postharvest management etc.; Geospatial technology: Concepts, techniques, components and uses for generating valuable agri-information;	8	3
4	**Unit 4**	Decision support systems: Concepts components and applications in agriculture; Agriculture Expert System; Soil Information Systems etc. for supporting farm decisions. Preparation of contingent crop-planning and crop calendars using IT tools; Digital India and schemes to promote digitalization of agriculture in India. Introduction to artificial intelligence, background and applications, Turing test. Control strategies, Breadth-first search, Depth-first search; Heuristics search techniques: Best-first search, A* algorithm,	8	4
6	**Unit 5**	Introduction to IoT and Big Data; Use of AI in agriculture for autonomous crop management, and health, monitoring livestock health, intelligent pesticide application, yield mapping and predictive analysis, automatic weeding and harvesting, sorting of produce, and other food processing applications; Concepts of smart agriculture, use of AI in food and nutrition science etc.	8	5
Practical				
		Study of computer components, accessories, practice of important DoS Commands, Introduction of different operating systems such as windows, Unix/ Linux, creating files and folders, File Management. Use of MS-WoRD and MS Power-point for creating, editing and presenting a scientific documents, MS- EXCEL - Creating a spreadsheet, Use of statistical tools, Writing expressions, Creating graphs, Analysis of scientific data, Handling macros. MS-ACCESS: Creating Database, preparing queries and reports, Demonstration of Agri- information system, Introduction to World Wide Web (WWW) and its components, Introduction of programming languages such as Visual Basic, Java, Fortran, C, C++, Hands on practice on Crop Simulation Models (CSM), DSSAT/Crop-Info/Crop Syst/ Wofost, Preparation of inputs file for CSM and study of model outputs, computation of water and nutrient requirements of crop using CSM and IT tools, Use of smart phones and other devices in agro-advisory and dissemination of market information, Introduction of Geospatial Technology, Hnds on practice on preparation of Decision Support System, Preparation of contingent crop planning, India Digital Ecosystem of Agriculture (IDEA).	30	CO 6

Reference Books:

- Yadav, D S, Foundations of IT, New Age, Delhi.
- Agri Informatics: An Introduction (Industry Series), by R Chakravarthy, ICFAI University Press
- Rajesh Singh, Anita Gehlot, Mahesh Pratap Gehlot, Bhupendra Singh 2020. Artificial Intelligence in Agriculture. New India Publishing Agency, New Delhi.
- Tofael Ahamed 2023. IoT and AI in Agriculture: Self- sufficiency in Food Production to Achieve Society 5.0 and SDGS Globally. Springer Singapore.
- Hemachandran K, Raul V. Rodriguez 2024. Artificial Intelligence for Business: An Implementation Guide Containing Practical and Industry- Specific Case Studies. Routledge, New York
- Chiranji Lal Chowdhary, Kumaresan Perumal, Logan Chella 2022. Innovative Supply Chain Management via Digitalization and Artificial Intelligence. Springer Verlag, Singapore
- E-Agriculture: Concepts and Applications (Agriculture Series), Rahul Gupta (Author), ICFA University Press

e-Learning Source:

Integral University, Lucknow

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	2	1	3	3	1	1	2	3	3	3	3	3	3	2	2	3	2	2	2
CO2	3	3	3	2	1	3	2	1	3	2	3	3	2	3	2	3	2	2	3	2	2
CO3	2	1	2	2	1	3	2	2		1		2	3	2	3	1	2	3	1	1	1
CO4	2	2	2	2	2	2	3	2		2	3	1	1	2	2	3	1	3	1	2	2
CO5	3	2	1	1	3	1	3	2	1	2	3	3	3	2	2	2	3	3	2	3	3
C)6	2	1	2	2	1	3	2	2		1		2	3	2	3	1	2	3	1	1	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-2026							
Course Code	AG143	**Title of the Course**	National Service Scheme I	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	**0**	**0**	**1**	**1**
Course Objectives	1. To provide an understanding of the history, objectives, and organizational structure of the National Service Scheme (NSS), including the roles and responsibilities of volunteers. 2. To familiarize students with NSS program activities, including regular and special camps, community surveys, and youth programs under the Government of India. 3. To develop skills in community mobilization, including identifying stakeholders, designing messages, and fostering youth-adult partnerships for social change. 4. To promote awareness of social harmony, national integration, and the role of youth in nation-building, conflict resolution, and peacebuilding. 5. To educate students on citizenship, the Indian Constitution, and human rights, including fundamental rights, consumer rights, and the role of family and community.						

Course Outcomes	
Students will be able to	
CO1	Learn about the history, objectives, principles, and organizational structure of the NSS, along with the code of conduct and responsibilities of NSS volunteers.
CO2	Learn how to plan and participate in NSS program activities, including village/slum adoption, community surveys, and youth programs initiated by the Government of India.
CO3	Learn the techniques of community mobilization, including identifying stakeholders, designing effective messages, and fostering youth-adult partnerships for social development.
CO4	Learn the role of youth in promoting social harmony, national integration, conflict resolution, and peacebuilding for a better society.
CO5	Learn about citizenship, the Indian Constitution, and human rights, including fundamental rights, duties, consumer awareness, and the importance of family and community in social development

Practical

Orientation: history, objectives, principles, symbol, badge; regular programs under NSS, Organizational structure of NSS, Code of conduct for NSS volunteers, points to be considered by NSS volunteers' awareness about health.

NSS program activities: Concept of regular activities, special camping, day camps, basis of adoption of village/slums, conducting survey, analyzing guiding financial patterns of scheme, youth program/ schemes of GOI, coordination with different agencies and maintenance of diary. Understanding youth. Definition, profile, categories, issues and challenges of youth; and opportunities for youth who is agent of the social change.

Community mobilization: Mapping of community stakeholders, designing the message as per problems and their culture; identifying methods of mobilization involving youth-adult partnership. Social harmony and national integration. Indian history and culture, role of youth in nation building, conflict resolution and peacebuilding. Volunteerism and shramdaan. Indian tradition of volunteerism, its need, importance, motivation, and constraints; shaman as part of volunteerism. Citizenship, constitution, and human rights: Basic features of constitution of India, fundamental rights and duties, human rights, consumer awareness and rights and rights to information. Family and society. Concept of family, community (PRIs and other community-based organizations) and society

Suggested Readings:

- National Service Scheme: A Youth Volunteers Programme for Undergraduate Students as per UGC Guidelines, Amit Kumar Jain, Brijesh Kumar Rathi, J.D.S. Panwar, ISBN: 9789351247951, Publisher: Daya Publishing House, Year: 2025
- National Service Scheme: Perspectives, Transformation and Prospects, Savita Mishra, Sudip Bhui, Publishers: Jaipur Book Enclave, 2022.
- HAND BOOK National Service Scheme, Sri Vasavi Engineering College (A) Pedatadepalli, Tadepalligudem.

e-Learning Source:

https://nss.gov.in/sites/default/files/manualNss2006.pdf

https://srivasaviengg.ac.in/uploads/nss.pdf

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)														
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	3	3	2	2	2	3	3	3	2	2	2	2
2CO2	2	1	2	3	2	2	2	1	1	1	1	1	2	2	2
CO3	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2
CO4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CO5	2	3	2	2	2	1	1	1	2	2	2	1	1	1	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	LN133	**Title of the Course**	Communication Skills	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	II	**1**	0	**1**	**2**
Course Objectives	To acquire competence in oral, written, and non-verbal communication, develop strong personal and professional communication skills, and demonstrate positive group communication.						

Course Outcomes	
Students will be able to	
CO1	Develop foundational understanding of communication principles and overcome communication barriers.
CO2	Build LSRW (Listening, Speaking, Reading, Writing) skills & apply them in professional communication.
CO3	Understand the grammatical rules related to sentence structure, modifiers & clauses.
CO4	Apply correct grammar usage and write effective sentences for real world communication scenarios.
CO5	Develop approaches of micro presentation, interview techniques and organization of public events.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Unit 1**	**Communication Process:** The magic of effective communication; Building self-esteem and overcoming fears; Concept, nature, and significance of the communication process; Meaning, types, and models of communication. Verbal and non-verbal communication; Linguistic and non-linguistic barriers to communication and reasons behind communication gap/ miscommunication.	8	CO1
2	**Unit 2**	**Basic Communication Skills:** Listening, Speaking, Reading, and Writing Skills; Precis writing/ Abstracting/Summarizing; Style of technical communication, Curriculum vitae/resume writing; Innovative methods to enhance vocabulary, analogy questions.	4	CO2
3	**Unit 3**	**Structural and Functional Grammar:** Sentence structure, modifiers, connecting words and verbal phrases, and clauses; Case: subjective case, possessive case, objective case;	4	CO3
4	**Unit 4**	**Structural and Functional Grammar:** Correct usage of nouns, pronouns, and antecedents, adjectives, adverbs, and articles; Agreement of verb with the subject: tense, mood, voice; Writing effective sentences; Basic sentence faults.	6	CO4
Practical				
Listening and note taking; Writing skills: precis writing, summarizing and abstracting; Reading and comprehension (written and oral) of general and technical articles; Micro-presentations and Impromptu Presentations: Feedback on presentations; Stage manners: grooming, body language, voice modulation, speed; Group discussions; Public speaking exercises; vocabulary building exercises; Interview Techniques; organization of events.			**30**	CO 5

Reference Books:
Business Communication: Process and Product by Mary Ellen Guffey & Dana Loewy
Effective Communication Skills by John Nielsen
The Art of Communicating by Thich Nhat Hanh
Academic Writing: A Handbook for International Students by Stephen Bailey
An Introduction to Functional Grammar by M.A.K. Halliday & Christian Matthiessen
Soft Skills: The Software Developer's Life Manual by John Sonmez (applies broadly to practical skills)
e-Learning Source:
Fundamentals of Horticulture Question Bank download from: https://agrimoon.com/fundamentals-of-horticultur-pdf-book/

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	-	-	1	-	-	-	-	-	-	-	2	2	3	3	2	2	1	1	2	2	1
CO2	-	-	1	-	-	-	-	-	-	-	1	3	3	3	2	2	2	3	3	2	1
CO3	-	-	1	-	-	-	-	-	-	-	-	2	3	2	2	2	1	3	3	2	1
CO4	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2	2	1	3	3	2	1
CO5	-	-	1	1	-	-	-	-	-	-	2	3	3	3	2	2	1	1	1	2	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	CA173	**Title of the Course**	Computer Programing and Data Structures	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**II**	**0**	**0**	**2**	**2**
Course Objectives	To make the students conversant on computer programming languages, specifically C language as well as to make him familiar with programming for simple agricultural engineering applications						

Course Outcomes	
Students will be able to	
CO1	Analyze the time and space efficiency of the data structure and Identity the appropriate data structure for given problem
CO2	Understand basic concepts of linked list and Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.
CO3	Understand the basic concepts of stack and queues through array and linked list.
CO4	Understand the basic knowledge of trees and graph.
CO5	Implement appropriate sorting/searching technique for given problem.

Unit No.	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction to high level languages; Structure programming, C programming, a simple C programming, execution of a C program, program and instruction; Familiarizing with Turbo C IDE; Building an executable version of C program	14	CO 1
2	Study of different operators such as arithmetic, relational, logical, assignment, increment and decrement, conditional, bitwise and special operators, precedence of arithmetic operators; Debugging a C program; Developing and executing simple programs	12	CO 2
3	Creating programs using decision making statements such as if, go to and switch; Developing program using loop statements while, do and for; Using nested control structures	10	CO 3
4	Familiarizing with one and two dimensional arrays; Using string functions; Creating user defined functions; Developing structures and union; Using local, global and external variables; Using pointers	10	CO 4
5	Developing linked lists in C language; Inserting an item in Linked List; Deleting an item in Linked List; Implementing Stacks; Implementing push/pop functions; Creating queues, Insertion/ Deletion in queues.	14	CO 5

Reference Books:

- Balagurusamy, “Programming in ANSI C”, McGraw-Hill Education
- M. Tannenbaum. “Data Structure Using C/C+”
- Horowitz and Sahani “Fundamental of Data Structure”, Galgotia Publication
- A Lipschutz “Data Structure”, Schaum series

e-Learning Source:

https://nptel.ac.in/courses/106102064,

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																			
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	3	1	2	1		1	-	-	-	-	-	-	-	2	1	1	3	3	2	1
CO2	3	1	2		1	1		-	-	-	-	-	-	-	2	1	2	3	3	2	1
CO3	2	1	2		1		1	-	-	-	-	-	-	-	1	2	2	1	1	1	2
CO4	3	1	1	1		1		-	-	-	-	-	-	-	2	1	1	3	3	2	1
CO5	1	1	3	1		2	1	-	-	-	-	-	-	-	2	2	1	1	1	2	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-26							
Course Code	ME115	**Title of the Course**	Engineering Drawing	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	II	**0**	0	**2**	**2**
Course Objectives	To enable the students to draw engineering drawings for some simple machines/ equipment						

Course Outcomes	
Students will be able to	
CO1	Design and layout basic engineering drawings for simple mechanical equipment
CO2	Handle various drawing instruments for accurate technical drawings
CO3	Develop skills in constructing representing the surfaces of geometric solids
CO4	Interpret and produce accurate orthographic projections of engineering components and draw mechanical fasteners like screws, bolts and keys
CO5	Design and layout basic engineering drawings for simple mechanical equipment

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Unit 1**	Introduction to engineering drawing, practice of different layout drawings; Drawing instruments and their use; Introduction to lines, letterings, single stroke letters and gothic letters; Dimensioning, dimension line, extension line, arrow head, continuous and progressive dimensioning	12	CO1
2	**Unit 2**	Introduction of drawing scales, representative fraction; Practice on orthographic projections, references planes, points and lines in space; Drawing for orthographic projection of points by first angle projection method; Third angle methods of projection; Projection of planes	12	CO2
3	**Unit 3**	Projections of solids: polyhedra, cylinder, cone; Projections of solids: prisms and pyramids; Development of surfaces of geometrical solids; Drawing the section of solids: cylinder, cone and sphere; Introduction to isometric scale, isometric view and isometric drawing; Isometric projection of geometrical solids; Preparation of working drawing from models and isometric views; Sectional drawing of simple machine parts	13	CO3
4	**Unit 4**	Nomenclature, thread profiles, multi start threads, left and right hand threads; Conventional representation of threads; Forms of screw threads like metric thread, whit worth thread; Square thread: acme thread, knuckle thread, buttress thread; Square headed and hexagonal nuts and bolts; Different types of lock nuts, studs, machine screws, cap screws and wood screws	12	CO4
5	**Unit 5**	Processes for producing leak proof joints; Drawing of different types of rivet heads and riveted joints and foundation bolts; Drawing of stud screws, set screws, butt, hexagonal and square; Drawing of keys: taper, rank taper, hollow saddle etc.; Symbols for different types of welded joints.	10	CO5

Reference Books:

Pradeep Jain, Engineering Graphics and Design, Khanna Books Publisher

N D Bhatt, Engineering Drawing, Charotar Publication

R K Dhawan, A Textbook of Engineering Drawing, S Chand Publication

Bhatt, N. D. 2010. Elementary Engineering Drawing. Charotar Publishing House Pvt. Ltd., Anand.

e-Learning Source:

https://www.youtube.com/watch?v=yk2SynF31cs

https://www.youtube.com/watch?v=uojN7SOHPBw&list=PL9RcWoqXmzaJT-fliqTSwUjWU4zCX_H2A

https://www.youtube.com/watch?v=uFJGNTxJlVk&list=PLDN15nk5uLiBuXu_VXENfC7tfugEI5sAb

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	-	-	-	-	-	2	-	1	2	-	-	-	2	1	1	2	1	3	2	1
CO2	3	2	2	-	-	-	2	-	1	2	-	-	-	2	2	1	2	3	3	2	1
CO3	3	2	2	-	-	-	2	-	1	2	-	-	-	2	1	2	2	1	1	1	2
CO4	3	2	2	-	-	-	2	-	1	2	-	-	-	2	2	1	1	3	3	2	1
CO5	3	2	2	-	-	-	2	-	1	2	-	-	-	2	2	2	1	1	1	2	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-2026							
Course Code	AGV01	**Title of the Course**	Environmental Studies & Disaster Management	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**II**	**2**	**0**	**1**	**3**
Course Objectives	To expose and acquire knowledge on the environment and to gain the state-of-the-art - skill and expertise on management of disasters						

Course Outcomes	
Students will be able to	
CO1	Understand the structure, scope, and significance of environmental studies and major environmental issues and their interrelationships.
CO2	Classify natural resources and suggest sustainable management practices for their conservation
CO3	Analyze the causes & impacts of different types of environmental pollution and propose relevant control and management strategies.
CO4	Interpret environmental laws, ethical concerns, and social responsibilities related to environmental protection and human welfare.
CO5	Recognize various types of natural and man-made disasters and apply disaster management principles and frameworks for effective risk mitigation and emergency response.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Unit 1**	Introduction to Environment - Environmental studies: Definition, scope and importance - Multidisciplinary nature of environmental studies - Segments of Environment - Spheres of Earth - Lithosphere - Hydrosphere - Atmosphere - Different layers of atmosphere. Natural Resources: Classification - Forest resources. Water resources. Mineral resources Food resources. Energy resources. Land resources. Soil resources. Ecosystems: Concept of an ecosystem - Structure and function of an ecosystem - Energy flow in the ecosystem. Types of ecosystem. Biodiversity and its conservation: Introduction, definition, types. Biogeographical classification of India. Importance and Value of biodiversity. Biodiversity hot spots. Threats and Conservation of biodiversity.	10	CO1
2	**Unit 2**	Environmental Pollution: Definition, cause, effects and control measures of: a. Air pollution. b. Water pollution. c. Soil pollution. d. Marine pollution. e. Noise pollution. f. Thermal pollution h. Light pollution. Solid Waste Management: Classification of solid wastes and management methods, Composting, Incineration, Pyrolysis, Biogas production, Causes, effects and control measures of urban and industrial wastes. Social Issues and the Environment: Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Environmental ethics: Issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.	10	CO2
3	**Unit 3**	Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Human Population and the Environment: Environment and human health: Human Rights, Value Education. Women and Child Welfare. Role of Information Technology in Environment and human health	8	CO3
4	**Unit 4**	Disaster management: Disaster definition - Types - Natural Disasters - Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves. Man Made Disasters: Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, road accidents, rail accidents, air accidents, sea accidents. International and National strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community-based organizations and media in disaster management. Central, state, district and local administration in disaster control; Armed forces in disaster response; Police and other organizations in disaster management.	12	CO4
Practical				
		Visit to a local area to document environmental assets river/forest/grassland/hill/mountain. Energy: Biogas production from organic wastes. Visit to wind mill / hydro power / solar power generation units. Biodiversity assessment in farming system. Floral and faunal diversity assessment in polluted and un polluted system. Visit to local polluted site - Urban/Rural/Industrial/Agricultural to study of common plants, insects and birds. Environmental sampling and preservation. Water quality analysis: pH, EC and TDS. Estimation of Acidity, Alkalinity. Estimation of water hardness. Estimation of DO and BOD in water samples. Estimation of COD in water samples. Enumeration of *E. coli* in water sample. Assessment of Suspended Particulate Matter (SPM). Study of simple ecosystem – Visit to pond/river/hills. Visit to areas affected by natural disaster.	30	CO 5

Suggested Readings:

1. De, A.K. 2010. Environmental chemistry. Published by New Age International Publishers, New Delhi. ISBN:13–978 81 224 2617 5. 384 pp
2. Dhar Chakrabarti, P.G. 2011. Disaster management - India's risk management policy frameworks and key challenges. Published by Centre for Social Markets (India), Bangalore. 36pp.
3. Erach Bharucha, Text book for Environmental studies. University Grants Commission, New Delhi
4. Parthiban, K.T. Vennila, Prasanthrajan, S., Umesh, M. and Kanna, S. 2023. Forest, Environment, Biodiversity and Sustainable development. Narendra Publishing House, New Delhi, India. (In Press).
5. Prasanthrajan M. and Mahendran, P.P. 2008. A text book on Ecology and Environmental Science. ISBN 81-8321-104-6. Agrotech Publishing Academy, Udaipur - 313 002. First Edition: 2008
6. Prasanthrajan M. 2018. Objective environmental studies and disaster management. ISBN 9789387893825. Scientific publishers, Jodhpur, India. Pp. 146.
7. Sharma, P.D. 2009. Ecology and Environment, Rastogi Publications, Meerut, India
8. Tyler Miller and Scot Spoolman. 2009. Living in the Environment (Concepts, Connections, and Solutions). Brooks/cole, Cengage learning publication, Belmont, USA

Integral University, Lucknow

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	2	1	3	2	1
CO2	2	1	1	1	1	1	1	3	1	1	1	1	1	1	2	1	2	3	3	2	1
CO3	2	1	1	1	1	1	1	3	1	1	1	1	1	1	1	2	2	1	1	1	2
CO4	2	1	1	1	1	1	1	3	1	1	1	1	1	1	2	1	1	3	3	2	1
CO5	2	1	1	1	1	1	1	3	1	1	1	1	1	1	2	2	1	1	1	2	1

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-2026							
Course Code	AG139	**Title of the Course**	Farming Based Livelihood Systems	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	I	**2**	**0**	**1**	**3**
Course Objectives	1. To make the students aware about farming-based livelihood systems in agriculture 2 To disseminate the knowledge and skill how farming-based systems can be a source of livelihood						

Course Outcomes	
Students will be able to	
CO1	Analyze the status of agriculture in India and evaluate its impact on the income and livelihoods of rural and urban populations.
CO2	Identify and describe various farming systems and their components, including crops, livestock, horticulture, and integrated models, to understand their role in supporting livelihoods.
CO3	Evaluate the integration of small-, medium-, and large-scale enterprises within agricultural value chains to enhance rural income and sustainability.
CO4	Assess the feasibility of different farming-based livelihood models across diverse agro-climatic zones using case studies and real-world examples.
CO5	Analyze and evaluate diverse farming systems and agri-based livelihood models across agro-climatic zones, assess their components, production potential, and profitability, and apply this knowledge to formulate integrated agri-enterprise projects, including cost-benefit analysis and value chain integration.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Unit 1**	Status of agriculture in India and different states, Income of farmers and rural people in India, Livelihood-Definition, concept and livelihood pattern in urban and rural areas, Different indicators to study livelihood systems. Agricultural livelihood systems (ALS): Meaning, approach, approaches and framework	8	CO1
2	**Unit 2**	Definition of farming systems and farming based livelihood systems Prevalent Farming systems in India contributing to livelihood. Types of traditional and modern farming systems. Components of farming system/ farming-based livelihood systems- Crops and cropping systems, Livestock (Dairy, Piggery, Goatry, Poultry, Duckry etc.), Horticultural crops, Agro--forestry systems, Aqua culture Duck/Poultry cum Fish, Dairy cum Fish, Piggery cum Fish etc.	10	CO 2
3	**Unit 3**	Small-, medium- and large- enterprises including value chains and secondary enterprises as livelihood components for farmers, Factors affecting integration of various enterprises of farming for livelihood. Feasibility of different farming systems for different agro-climatic zones, Commercial farming-based livelihood models by NABARD, ICAR and other organizations across the country, Case studies on different livelihood enterprises associated with the farming.	12	CO 3
4	**Unit 4**	Risk and success factors in farming-based livelihood systems, Schemes and programs by Central and State Government, Public and Private organizations involved in promotion of farming-based livelihood opportunities. Role of farming-based livelihood enterprises in 21st Century in view of circular economy, green economy, climate change, digitalization and changing life style.	10	CO 4
Practical				
Survey of farming systems and agricultural based livelihood enterprises, Study of components of important farming based livelihood models/ systems in different agro-climatic zones, Study of production and profitability of crop based, livestock based, processing based and integrated farming based livelihood models, Field visit of innovative farming system models. Visit of Agri-based enterprises and their functional aspects for integration of production, processing and distribution sectors and Study of agri-enterprises involved in industry and service sectors (Value Chain Models), Learning about concept of project formulation on farming-based livelihood systems along with cost and profit analysis, Case study of Start-Ups in agri-sectors.			30	CO 5

Suggested Readings:

Ashley, C. and Carney, D. 1999. Sustainable Livelihoods: Lessons from Early Experience; Department for International Development: London, UK; Volume 7.

Carloni, A. 2001. Global Farming Systems Study: Challenges and Priorities to 2030 – Regional Analysis: Sub-Saharan Africa, Consultation Document, FAO, Rome, Italy

Dixon, J. and A. Gulliver with D. Gibbon. 2001. Farming Systems and Poverty: Improving Farmers' Livelihoods in a Changing World. FAO & World Bank, Rome, Italy & Washington, DC, USA

Livelihood Improvement of Underprivileged Farming Community: Some Experiences from Vaishali, Samastipur, Darbhanga and Munger Districts of Bihar by B. P. Bhatt, Abhay Kumar, P.K. Thakur, AmitavaDeyUjjwal Kumar, Sanjeev Kumar, B.K. Jha, Lokendra Kumar, K. N. Pathak, A. Hassan, S. K. Singh, K. K. Singh and K. M. Singh ICAR Research Complex for Eastern Region ICAR Parisar, P.O. Bihar Veterinary College, Patna - 800 014, Bihar

Panwar et al. 2020. Integrated Farming System models for Agricultural Diversification, Enhanced Income and employment, Indian Council of Agricultural Research, New Delhi.

Singh, J.P., et al. 2015. Region Specific Integrated Farming System Models, ICAR-Indian Institute of Farming Systems Research, Modipuram.

Walia, S. S. and Walia, U. S. 2020. Farming System and Sustainable Agriculture, Scientific Publishers, Jodhpur, Rajasthan

e-Learning Source:

http://ndl.ethernet.edu.et/bitstream/123456789/90288/3/Farming%20system%20and%20LA%20handout.pdf \

https://www.scribd.com/document/781312218/CC-112-AGRO-122-Farming-Based-Livelihood-Systems-Theory-Notes-B-Kale

Integral University, Lucknow

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																				
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	2	2	2	2	3	3	2	2	3	1	1	3	3	2	3	3	2	1
CO2	3	3	3	2	1	1	1	2	2	2	2	2	1	1	2	2	2	2	2	2	2
CO3	3	3	3	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	1	2	1
CO4	3	3	3	2	3	3	3	3	3	3	3	3	1	1	3	3	3	3	3	3	3
CO5	3	3	3	2	3	3	3	3	2	2	2	2	1	1	2	2	2	2	2	2	2

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2025-2026							
Course Code	AG149	**Title of the Course**	National Service Scheme II	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	II	**0**	**0**	**1**	**1**
Course Objectives	To evoke social consciousness among students through various activities viz., working together, constructive, and creative social work, to be skilled in executing democratic leadership, developing skill in program, to be able to seek self-employment, reducing gap between educated and uneducated, increasing awareness and desire to help sections of society						

Course Outcomes	
Students will be able to	
CO1	Explain the importance types & qualities of youth leadership & its role in community development
CO2	Apply life competencies like decision-making, communication, and problem-solving in community and personal settings
CO3	Understand the structure and objectives of youth development programs at national, state, and voluntary levels.
CO4	Understand the importance of health education, hygiene, nutrition, and their impact along with national health and sanitation initiatives.
CO5	Practice yoga and utilize it as a preventive and curative approach for maintaining a healthy and balanced lifestyle

Practical	**Contact Hrs.**	**Mapped CO**
Importance and role of youth leadership. Meaning, types and traits of leadership, qualities of good leaders; importance and roles of youth leadership, Life competencies. Definition and importance of life competencies, problem-solving and decision-making, interpersonal communication. Youth development programs. Development of youth programs and policy at the national level, state level and voluntary sector; youth-focused and youth-led organizations. Health, hygiene and sanitation. Definition needs and scope of health education; role of food, nutrition, safe drinking water, waterborne diseases and sanitation (Swachh Bharat Abhiyan) for health; national health programs and reproductive health. Youth health, lifestyle, HIV AIDS and first aid. Healthy lifestyles, HIV AIDS, drugs and substance abuse, home nursing and first aid. Youth and yoga. History, philosophy, concept, myths, and misconceptions about yoga; yoga traditions and its impacts, yoga as a tool for healthy lifestyle, preventive and curative method.	30	1, 2, 3, 4, 5

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	1	2	2	3	3	3	2	2	2	2	2	2	2	3	3	2	3	3	2	3	3
CO2	1	2	2	2	2	1	1	1	2	2	1	1	3	3	2	2	2	2	2	2	2
CO3	1	2	2	3	3	2	2	2	3	3	2	2	3	3	2	2	2	2	2	2	2
CO4	1	2	2	2	1	1	1	2	2	2	1	2	3	3	3	3	3	3	3	3	3
CO5	1	3	3	3	1	2	2	2	2	2	2	2	1	3	1	2	3	1	2	3	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	**Sign & Seal of HoD**