Integral University, Lucknow
Integral Institute of Agricultural Science and Technology
Evaluation Scheme of Undergraduate program
B. Tech. Agricultural Engineering

Semester - I

Course Code	Subject	Periods Per h/week/sem			Evaluation Scheme Theory Mid sem			Evaluation Scheme Practical Examination					End sem Theory Exam	Subject total	Credit	Total Credit Points
								Sessional			End sem exam (Taken by external examiner)	Sub Total (sessional + exam)$^{b+c}$				
		L	T	P	CT	TA	Total^a	CT	TA	Total^b	Total^c					
MT110	Engineering Mathematics-I	3	0	0	10	10	**20**	-	-	-	-	**-**	80	100	3:0:0	3
PY106	Engineering Physics	2	0	2	10	10	**20**	5	5	10	20	**30**	50	100	2:0:1	3
CH116	Engineering Chemistry	2	0	2	10	10	**20**	5	5	10	20	**30**	50	100	2:0:1	3
ME107	Workshop Practice in Agriculture	0	0	2	-	-	-	5	5	10	90	**100**	-	100	0:0:1	1
AE101	Surveying and Leveling	1	0	4	10	10	**20**	5	5	10	20	**30**	50	100	1:0:2	3
ME108	Engineering Drawing	0	0	4	-	-	-	5	5	10	90	**100**	-	100	0:0:2	2
EE101	Electrical Circuits	2	0	2	10	10	**20**	5	5	10	20	**30**	50	100	2:0:1	3
BM121	Human Values and Agricultural Ethics	2	0	0	10	10	**20**	-	-	-	-	**-**	80	100	2:0:0	2
LN102	Functional Skills in English	2	0	2	10	10	**20**	5	5	10	20	**30**	50	100	2:0:1	3
	Total	14		18												23

Theory mid sem (20 marks) = Mid sem/ makeup (10 marks) + Quiz 1 (2.5 marks) + Quiz 2 (2.5 marks) + Attendance (5 marks)

Practical mid sem (10 marks) = CT (5 marks) + TA (2.5 marks) + Attendance (2.5 marks)

End sem exam practical (Taken by external examiner) = 20 marks

End sem final theory = 100 marks (40 marks objective type and 60 marks subjective type questions)

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Engineering Mathematics-I
Paper Code: MT110
w.e.f. Session 2015-16

3 (3+0)

Differential calculus: Taylor's and Maclaurin's expansions; indeterminate form; curvature, asymptotes, tracing of curves, function of two or more independent variables, partial differentiation, homogeneous functions and Euler's theorem, composite functions, total derivatives, derivative of an implicit function, change of variables, Jacobians, error evaluation, maxima and minima. Integral calculus: Reduction formulae; rectification of standard curves, volumes and surfaces of revolution of curves; double and triple integrals, change of order of integration, Gamma and Beta functions, application of double and triple integrals to find area and volume. Ordinary differential equations: Exact and Bernoulli's differential equations, equations reducible to exact form by integrating factors, equations of first order and higher degree, Clairaut's equation, Differential equations of higher orders, methods of finding complementary functions and particular integrals, method of variation of parameters, Cauchy's and Legendre's linear equations, simultaneous linear differential equations with constant coefficients, series solution techniques, Bessel's and Legendre's differential equations. Vector calculus: Differentiation of vectors, scalar and vector point functions, vector differential operator Del, Gradient of a scalar point function, Divergence and Curl of a vector point function and their physical interpretations, identities involving Del, second order differential operator; line, surface and volume integrals, Stoke's, divergence and Green's theorems (without proofs).

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Engineering Physics
Paper Code: PY106
w.e.f. Session 2015-16

3 (2+1)

Dia, Para and ferromagnetism-classification. Langevin theory of dia and paramagnetism. Adiabatic demagnetization, Weiss molecular field theory and ferromagnetism. Curie-Weiss law. Wave particle quality, de-Broglie concept, uncertainty principle. Wave function, Time dependent and time independent Schrodinger wave equation, Qualitative explanation of Zeeman effect, Stark effect and Paschan Back effect, Raman spectroscopy. Statement of Bloch's function, Bands in solids, velocity of Bloch's electron and effective mass. Distinction between metals, insulators and semiconductors, Intrinsic and extrinsic semiconductors, law of mass action, Determination of energy gap in semiconductors, Donors and acceptor levels. Superconductivity, critical magnetic field, Meissner effect, Isotope effect, Type-I and II superconductors, Josephson's effect DC and AC, Squids, Introduction to high T_c superconductors. Spontaneous and stimulated emission, Einstein A and B coefficients, Population inversion, He-Ne and Ruby lasers, Ammonia and Ruby masers, Holography-Note. Optical fiber, Physical structure, basic theory. Mode type, input output characteristics of optical fiber and applications. Illumination: laws of illumination, luminous flux, luminous intensity, candle power, brightness.

Practical: To find the frequency of A.C. supply using an electrical vibrator; To find the low resistance using Carey Foster bridge without calibrating the bridge wire; To determine dielectric constant of material using De Sauty's bridge; To determine the value of specific charge (e/m) for electrons by helical method; To study the induced e.m.f. as a function of velocity of the magnet; To obtain hysteresis curve (B-H curve) on a C.R.O. and to determine related magnetic quantities; To study the variation of magnetic field with distance along the axis of a current carrying circular coil and to determine the radius of the coil; To determine the energy band gap in a semiconductor using a p-n Junction diode; To determine the slit width from Fraunhofer diffraction pattern using laser beam; Determination of ultrasonic wave velocity in a liquid medium; To find the numerical aperture of optical fiber; To set up the fiber optic analog and digital link; To study the phase relationships in L.R. circuit; To study LCR circuit; To study the variations of thermo e.m.f. of a copper-constantan thermocouple with temperature; To find the wave length of light by prism.

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Engineering Chemistry
Paper Code: CH116
w.e.f. Session 2015-16

3 (2+1)

Phase rule and its application to one and two component systems. Fuels: classification, calorific value. Colloids: classification, properties. Corrosion: causes, types and method of prevention. Water: temporary and permanent hardness, disadvantages of hard water, scale and sludge formation in boilers, boiler corrosion. Analytical methods like thermogravimetric, polarographic analysis, nuclear radiation , detectors and analytical applications of radioactive materials. Enzymes and their use in the manufacturing of ethanol and acetic acid by fermentation methods. Principles of food chemistry, introduction to lipids, proteins, carbohydrates, vitamins, food preservators, colouring and flavouring reagents of food. Lubricants: properties, mechanism, classification and tests. Polymers. types of polymerization, properties, uses and methods for the determination of molecular weight of polymers. Introduction to IR spectroscopy.

Practical: Determination of temporary and permanent hardness of water by EDTA method; Estimation of chloride in water; Estimation of dissolved oxygen in water; Determination of BOD in water sample; Determination of COD in water sample; Estimation of available chlorine in bleaching powder; Determination of viscosity of oil; Estimation of activity of water sample; Estimation of alkalinity of water sample; Determination of carbonate and non-carbonate hardness by soda reagent; Determination of coagulation of water and chloride ion content; Determination of specific rotation of an optically active compound; Determination of λmax and verification of Beer Lambert Law; Determination of calorific value of fuel; Identification of functional groups (alcohol aldelyde, keline, carbonylic acid and amide) by IR; Chromatographic analysis; Determination of molar refraction of organic compounds.

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Workshop Practice
Paper Code: ME107
w.e.f. Session 2015-16

1 (0+1)

Practical: Introduction to various carpentry tools, materials, types of wood and their characteristics and Processes OR operations in wood working; Preparation of simple joints: Cross half Lap joint and T-Halving joint; Preparation of Dovetail joint, Mortise and tenor joint; Introduction to Smithy tools and operations; Jobs on Bending, shaping etc.; Jobs on Drawing, Punching, Rivetting; Introduction to tools and measuring instruments for fitting; Jobs on sawing, filing and right angle fitting of MS Flat; Practical in more complex fitting job; Operations of drilling,, reaming, and threading with tap and dies; Practical test; Introduction to tools and operations in sheet metal work; Making different types of sheet metal joints using G.I. sheets.

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Surveying and Leveling
Paper Code: AE101
w.e.f. Session 2015-16

3 (1+2)

Surveying: Introduction, classification and basic principles, Linear measurements. Chain surveying. Compass survey. Errors in measurements, their elimination and correction. Plane table surveying. Levelling, Contouring, Computation of area and volume. Theodolite traversing. Introduction to setting of curves.

Practical: Chain survey of an area and preparation of map; Compass survey of an area and plotting of compass survey; Plane table surveying; Leveling. L-section and X-sections and its plotting; Contour survey of an area and preparation of contour map; Introduction of software in drawing contour; Theodolite surveying; Ranging by theodolite, Height of object by using theodolite; Setting out curves by theodolite; Minor instruments.

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Engineering Drawing
Paper Code: ME108
w.e.f. Session 2015-16

2 (0+2)

Practical: Introduction of drawing scales; Principles of orthographic projections; References planes; Points and lines in space and traces of lines and planes; Auxiliary planes and true shapes of oblique plain surface; True length and inclination of lines; Projections of solids (Change of position method, alteration of ground lines); Section of solids and Interpenetration of solid-surfaces; Development of surfaces of geometrical solids; Isometric projection of geometrical solids.

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Electrical Circuits
Paper Code: EE101
w.e.f. Session 2015-16

3 (2+1)

Average and effective value of sinusoidal and linear periodic wave forms. Independent and dependent sources, loop current and loop equations (Mesh current method), node voltage and node equations (Nodal voltage method), Network theorems: Thevenin's, Norton's, Superposition, Reciprocity and Maximum power transfer, Star- Delta conversion solution of DC circuit by Network theorems, Sinusoidal steady state response of circuits, Instantaneous and average power, power factor, reactive and apparent power, Concept and analysis of balanced polyphase circuits, Laplace transform method of finding step response of DC circuits, Series and parallel resonance, Classification of filters, constant-k, m-derived, terminating half network and composite filters.

Practical: To familiarize with the components and equipments used in Laboratory; To verify Kirchhoff's current laws; To verify Kirchhoff's voltage laws; To verify Thevenin theorems; To verify Norton's theorems; To verify Superposition theorem; To verify reciprocity theorem; To study the sinusoidal response of RL series circuit; To study the sinusoidal response of RC series circuit; To study the step response of RL series circuit; To study the step response of RC series circuit; To study the response of constant K-filters; To study the response of m-derived filters; To study power consumed in a three-phase circuit.

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Human Values and Agricultural Ethics
Paper Code: BM121
w.e.f. Session 2015-16

2 (2+0)

Human Value Education: Understanding the need, basic guidelines, content and process for value education, self exploration- its content and process: natural acceptance experiential validation- as the mechanism for self exploration, continuous happiness and prosperity-A look at basic human aspiration, right understanding, relationship and physical facilities-the basic requirement for fulfillment of aspirations of every human being with their correct priority, understanding happiness and prosperity correctly. Introduction to ethical concept: Definition of agricultural ethics and values, ethical rules of agricultural workers. Farm structure ethics, Animal ethics, ethics of food safety, Environmental impact of agricultural practices and ethical concern, Ethics of international trade, Food security, Social justice in farming, Research ethics. Values and value jugdements. Moral rights and moral rules, Moral character and responsibilities, privacy, confidentiality. Ethics as Law. Professional responsibility: The basis and scope of professional responsibility, profession and norms of professional conducts, ethical standards versus profession, culpable mistakes, the autonomy of professions and codes of ethics. Employee status and professionalism. Valuing time–co-operation commitment. Global issues: A Glimpse of life stories: life story of prophet Mohammad, Mahatma Gandhi, Swami Vivekanand, Marie Curie and Steve Jobs.

B. Tech. Agricultural Engineering
SEMESTER-I
Syllabus: Functional Skills in English
Paper Code: LN102
w.e.f. Session 2015-16

3 (2+1)

Basic Grammar: Articles, Prepositions, Tenses (kinds and uses), Subject-verb agreement, kinds of sentences. Basic Vocabulary: Synonyms, Antonyms, Word-formation, One-word substitution, Words often confused. Basic composition: Paragraph writing and Essay writing. Basic phonetics: Syllable, Stress, The sounds of English. Short stories: "The Meeting Pool" by Ruskin Bond and "The Portrait of a Lady" by Khushwant Singh.

Practical: Introduction (Instructor, students and curriculum), Listening exercises, Framing questions, Making small talks, Presentation-making tips, Dos and don'ts/group presentations.
Group presentations
Phonetic alphabet (IPA)
Phonetic transcription
Intonation