Integral University, Lucknow
Study & Evaluation Scheme
B. Tech. CSE(Cloud computing and Artificial Intelligence) in association with IBM
(w.e.f. Session: 2020-21)

Year 1st Semester – I

Sl. No.	Subject Code	Category	Subject	Periods				Evaluation Scheme				Subject Total
								Sessional			Exam.	
				L	T	P	C	CT	TA	Total	ESE	
1	PY101	BS	Physics	3	1	-	4	40	20	60	40	100
2	LN101	HM	Professional Communication-I	2	1	-	3	40	20	60	40	100
3	MT101	BS	Engg. Mathematics I	3	1	-	4	40	20	60	40	100
4	EE103	ESA	Basic Electrical Engg.	3	1	-	4	40	20	60	40	100
5	EC101	ESA	Basic Electronics	3	1	-	4	40	20	60	40	100
6	PY104	BS	Physics Lab	-	-	2	1	40	20	60	40	100
7	EE104	ESA	Electrical Engg. Lab	-	-	2	1	40	20	60	40	100
8	ME103	ESA	Engg Graphics	-	-	2	1	40	20	60	40	100
9	CS125	DC	Digital Workforce Skills	-	-	2	1	40	20	60	40	100
			Total	**14**	**6**	**8**	**23**	**360**	**180**	**540**	**360**	**900**

L-Lecture   **T-**Tutorial   **P-**Practical   **C-**Credits   **CT-**Class Test   **TA-**Teacher Assessment

Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

BS- Basic Science   **DC-** Departmental Core

HM- Humanities   **OE-** Open Elective

DE- Departmental Elective   **ESA-** Engineering Sciences & Arts (Foundation Course & Engineering Courses)

PHYSICS (PY101)
(w.e.f. Session: 2015-16)

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Unit I: Electrostatics- **8**
Boundary conditions and Boundary value problems in electrostatics, The Uniqueness theorem, Laplace and Poisson's equations in electrostatics and their applications, method of electrical images and their simple applications, energy stored in discrete and continuous system of charges.

Unit II: Wave Optics- **8**
Methods of formation of coherent sources, **Theory of Interference**, Fresnel's Biprism, **Displacement of Fringes**, thin film interference, Newton's ring. Fraunhoffer diffraction at single slit and grating, Rayleigh's criterion of resolution, resolving power of grating.

Unit III: Optical activity and Modern Optics- **8**
Production of plane polarized light by reflection and Double refraction, Nicol prism. Optical activity, **Fresnel's theory**, polarimeter (Laurentz and Biquartz).
Principle of fiber optics, numerical aperture, attenuation, dispersion in optical fibers, material dispersion, waveguide dispersion, intermodal and intramodal dispersion, Pulse dispersion in step index fiber, Main components of laser, Einstein's coefficients, He-Ne laser, Nd-YAG laser and their applications.

Unit IV: Properties of Matter and Relativistic Mechanics- **8**
Viscosity, Poiseulli's equation, Frame of reference, Michelson-Morley experiment and its implications, Galilean transformation equations, Einstein's postulates, Lorentz transformation equations and their consequences, energy mass relation, **relativistic kinetic energy**.

Unit V: Quantum Physics- **8**
Compton effect, Basic postulates of quantum mechanics, Wave function and its physical admissibility, orthogonality and normalization of wave functions, Heisenberg's uncertainty principle(no derivation) and its applications to (non-existence of electron in nucleus, Bohr's radius), Schrodinger's equation and its application to particle in 1-D box and finite well.

PHYSICS LAB (PY104)
(w.e.f. Session: 2015-16)

1. To determine the wave length of monochromatic light by Newton's ring.

2. To determine the wave length of monochromatic light with the help of Fresnel's Biprism.

3. To determine the focal length of two lenses by nodal slide and locate the position of cardinal points.

4. To determine the specific rotation of cane sugar solution using Biquartz polarimeter.

5. To determine the wavelength of spectral lines using plane transmission grating.

6. To determine the Brewster's angle and refractive index of material with the help of a laser source.

7. To determine the variation of magnetic field along the axis of a current carrying coil and then to estimate the radius of the coil.

8. To verify Stefan's law by electrical method.

9. To determine the energy band gap of a given semiconductor material.

10. To determine the viscosity of a liquid.

PROFESSIONAL COMMUNICATION-I (LN101)
(w.e.f. Session: 2015-16)

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UNIT I Introduction to Communication   04 hrs
Definition, Types of Communication, Channels of Communication, Language

UNIT II Interpersonal Communication   06 hrs
Culture- Definition and Types, Communication and Culture including Cross Cultural Communication

UNIT III Written Communication   08 hrs
Letter Writing- Informal and Formal - Letters of Enquiry, Letters of complaint, Response to complaints and enquiries,
Self Exploration through description

UNIT IV Grammar through Worksheets   12 hrs
Situational activities and modules- Parts of Speech, Tenses, Articles, Modals,
Active and Passive, Subject-Verb Agreement, Direct and Indirect Speech, Degrees of comparison

UNIT V Grammar through Worksheets Continued   10 hrs
Sentences: Simple, Compound, Complex, Declarative, Assertive, Negative, Interrogative, Exclamatory, Imperative

RECOMMENDED BOOKS:

1. Wren PC and Martin H, "High School Grammar and Composition", S. Chand and Co.

2. K. Floyd , "Interpersonal Communication: The Whole Story" (2009), McGraw Hill,

3. Greenbaum Sidney and Nelson Gerald, "An Introduction To English Grammar", Pearson

4. Swan Michael, "Practical English Usage" OUP, 2005

5. Raymond Murphy, " Intermediate English Grammar", (2007) Cambridge University Press

BASIC ELECTRICAL ENGINEERING (EN101)

(w.e.f. Session: 2015-16)

Credits: 04

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UNIT-1 :D.C Circuit Analysis and Network Theorems
Circuit concepts: Concept of network, Active and passive elements, voltage and current sources, concept of linearity and linear network, unilateral and bilateral elements, R L and C as linear elements, source transformation, Kirchoff's Law: loop and nodal methods of analysis, star delta transformation, network theorems: Thevenin's theorem, Norton's theorem, maximum power transfer theorem. (8)

UNIT-2: Steady State Analysis of Single Phase AC Circuits
AC fundamentals: Sinusoidal, square and triangular waveforms-average and effective value, form the peak factors, concept of phasors, phasors representation of sinusoidally varying voltage and current, analysis of series-parallel RLC circuits. Apparent, active and reactive powers, power factor, causes and problems of low power factor, power factor improvement, resonance in series and parallel circuits, bandwidth and quality factors. (8)

UNIT-3 :Three Phase AC Circuits
Three phase system: Its necessity and advantages, meaning of phase sequence, star and delta connections, balanced supply and balanced load, line and phase voltage/current relation, three phase power measurements.
Measurement Instruments :Types of instruments: construction and working principle of PMMC and MI type voltmeter and ammeters, single phase dynamometer type wattmeter and induction type energy meter, use of shunts and multipliers (8)

UNIT-4: Introduction of Power System:
general layout of electrical power system and function of its elements, standard transmission and distribution voltages, concept of grid.
Magnetic circuit: Concepts, analogy between electric and magnetic circuit, magnetic circuits with DC and AC excitation, magnetic leakage, BH curve, hysteresis and eddy current losses, magnetic circuit calculation, mutual coupling.
Single Phase Transformer: Principle of operation, construction, emf equation, equivalent circuit, power losses, efficiency, Introduction to auto transformers. (8)

UNIT-5: Principle of Electromechanical energy conversion
DC Machines: Types, emf equation of generator and torque equation of motor, characteristics and applications of DC motors.
Three Phase Induction Motor: Type, principle of operation, slip-torque Characteristics, applications.
Single Phase Induction Motor: Principle of operation and introduction to methods of starting, applications.
Three Phase Synchronous Machines: Principle of operation of alternator and synchronous motor, applications. (8)

References:
1. V.Deltoro, "Principle of Electrical Engg." PHI.
2. M.A Mallick, Dr. I. Ashraf, "Fundamental of Electrical Engg," CBS Publishers.
3. A. Hussain, "Basic Electrical Engg" Dhanpat Rai & sons.
4. I J Nagrath,"Basic Electrical Engg" ,TMH

<div align="center">**ELECTRICAL ENGINEERING LAB (**EN102**)**

(w.e.f. Session: 2015-16)</div>

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LIST OF EXPERIMENTS:

1.Verification of Thevenin's Theorem.

2.Verification of Superposition Theorem.

3.Verification of Maximum Power Transfer Theorem.

4.To study V-I characteristics of diode.

5.To study the input & out put characteristics of BJT in CE configuration.

6.To study the full wave rectifier circuit with &without filter and determine the ripple factor.

7.To study the phenomenon of resonance in series RLC circuit.

8.Determination of losses in single phase transformer by OCT and SCT.

9.To calibrate a single phase induction type energy meter.

10.   To study the running and reversing of a three phase SCIM.

11. Study of OP Amp based inverting and non inverting amplifier.

BASIC ELECTRONICS (EC101)

(w.e.f. Session: 2015-16)

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UNIT-I

Semiconductor Diode

Mechanism of Conduction in Semiconductors: Mobility and Conductivity, Electrons and holes in an intrinsic semiconductors, Donor and acceptor impurities, Fermi level, Carrier densities in semiconductor, Hall effect, Diffusion, Recombination

Junction Diode

PN junction characteristic and its equation, Effect of Temperature, Depletion Layer, Piecewise linear diode model, Breakdown Mechanism, Zener and Avalanche Breakdown characteristics

Diode as circuit element

Half wave and full wave rectifiers, capacitive filters, Zener diode as a regulator, clamper, clipper and voltage doubler, **Special diode**- LED, Schottkey diodes .   (8)

UNIT-II
BJT characteristics and circuits

Transistor Operation, CE, CB, CC configuration and their characteristics, transistor biasing circuits, stability factor, h-parameter model (low frequency), computation of Ai, Av, Ri, Ro of single transistor CE amplifier configuration.   (8)

UNIT-III
Field Effect Transistors

JFET: Construction and principle of working**,** Drain / Transfer characteristics, basic amplifier circuits, Biasing of JFET

MOSFET: Enhancement and depletion type N-channel, P-channel, Drain.   (8)

UNIT-IV
Switching theory & Logic gates

Number system, Conversion, Compliments, Addition and Subtraction, BCD numbers, Boolean algebra, Canonical form, Logic gates, Minimization of logical function using Karnaugh Map (8)

UNIT-V
Operational Amplifier

Concept of ideal operational amplifier (inverting and non-inverting) and its applications,
Inverter, integrator, differentiator, voltage follower, summing and differential amplifier   (8)

Electronic Instruments: Digital Multimeter (block diagram approach), CRO (block diagram and its working),Measurement of voltage, phase, frequency. Double beam CRO (block diagram & its working).

Text Books

1. Bolyested& Nashekey / Electronic Devices and Circuit Theory, PHI

2. Milliman & Halkias: Integrated Electronics , Mc Graw Hill

3. J. S. Katre: Electronics Engineering, Tech-Max Publication

Reference Books:

Sedra and Smith / Microelectronic Circuits/ TMH

ENGINEERING GRAPHICS (ME103)

(w.e.f. Session: 2015-16)

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1. **Introduction**
   Engineering graphics as a tool to communicate ideas, Lettering and dimensioning. Construction of geometrical figures like pentagon and hexagon.

2. **Orthographic Projection**
   Principles of orthographic projections Principal and auxiliary planes, First and Third angle projections.
   Projection of points. Pictorial view.
   Projection of lines parallel to both the planes. Parallel to one and inclined to other,
   Inclined to both the planes.
   Application to practical problems.
   Projection of solid in simple position, Axis or slant edge inclined to one and parallel to other plane, solids lying on a face or generator on a plane.
   Sectioning of solids lying in various positions, True shape of the section.
   Development of lateral surfaces, sheet metal drawing.

3. **Isometric Projection**

   Principles of isometric projection, Isometric projection using box and offset methods.

References:

1.   Bhatt. N.D. : Elementary Engineering Drawing Charothar Publishing.
2.   Laxmi Narayan V and Vaish W: A Text Book of Practical Geometry and Geometrical drawing.

B. Tech. 1st year   **IInd Sem**

Subject: Engineering Mathematics-II (common to all branches except BT & FT)
Subject Code: MT112

(Revised w.e.f. session 2015-2016)

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Unit-I Differential Equations   **[**8**]**

Linear differential equations of first order, Linear differential equations of higher order with constant coefficients, Complementary functions and particular integrals, Simultaneous linear differential equations, Solution of second order differential equations by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems (without derivation) .

Unit-II : Laplace Transform   **[**8**]**

Laplace transform, Existence theorem, Laplace transform of derivatives and integrals, Unit step function, Dirac-delta function, Laplace transform of periodic functions, Inverse Laplace transform ,Convolution theorem, Applications to solve simple linear and simultaneous differential equations.

Unit-III : Fourier Series and Partial Differential Equations   **[**9**]**

Periodic functions, trigonometric series , Fourier series of period 2π, Euler's formulae, functions having arbitrary period, change of interval, Even and odd functions, Half range sine and cosine series.

Introduction of partial differential equations, linear partial differential equations with constant coefficients of second order and their classifications to parabolic, elliptic and hyperbolic forms with illustrative examples.

Unit-IV: Applications of Partial Differential Equations   **[**8**]**

Method of separation of variables for solving partial differential equations, Wave equation up to two-dimensions, Laplace equation in two-dimensions, Heat conduction equations up to two dimensions, Equations of transmission Lines.

Unit-V: Curve fitting and Solution of Equations   **[**7**]**
Method of least squares , curve fitting of straight line and parabola, Solution of cubic and biquadratic equations.

Reference Books:

1.	E. Kreyszig	Advanced Engineering Mathematics,
		Wiley Eastern Ltd.
2.	Jaggi and Mathur	Advanced Engineering Mathematics, Khanna Pub.
3.	B. S. Grewal	Higher Engineering Mathematics, Khanna Pub.
4.	Dennis G. Zill	Advanced Engineering Mathematics, CBS Pub.

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Machine Shop

1. To study and sketch a Lathe Machine.
2. Practice of operations: Facing, Plane turning, Step turning, Taper turning, Chamfering as per dimension given in drawing.

Fitting Shop

1. To study and sketch a fitting tools and equipments.
2. Practice of Step cutting, Filing, Drilling & Tapping.
3. To make a 900 V-groove fitting on M. S. flat.

Carpentry Shop

1. To study and sketch different types of carpentry tools & machine.
2. To make a mortise and Tenon joint as per dimension given in drawing.
3. To make a corner lap joint as per dimension given in drawing.

Smithy Shop

1. To study and sketch different types of smithy tools &.equipments.
2. To make a square punch from M.S. round rod.
3. To make a pipe hook from a M.S. round rod.

Welding Shop

1. To study and sketch different types of welding equipments &.tools.
2. To weld the two given plates & make a Lap joint (By Arc Welding).
3. To weld the two given plates & make a Butt joint (By Arc Welding).

Sheet Metal Shop

1. To study and sketch different types of sheet metal tools &.equipments.
2. To make a rectangular tray as per dimension given in drawing
3. To make a conical funnel as per dimension given in drawing.

Advanced Manufacturing Shop

1. To study and sketch CNC CO_2 LASER Machine.
2. To study and sketch the GUIDER-II 3-D printer.