

Integral University
STUDY & EVALUATION SCHEME
B.Tech. First Year
Computer Science & Engineering

Year 1st, Semester I

Sl. No	Course Category.	Subject Code	Name of the Subject	Periods				Evaluation Scheme			Subject Total	
				L	T	P	C	Sessional (CA)		End Sem. Exam. (ESE)		
								CT	TA			Total
1.	DC	PY101	Physics	3	1	-	4	40	20	60	40	100
2.	DC	LN101	Basic Professional Communication	2	1	-	3	40	20	60	40	100
3.	DC	MT101	Engineering Mathematics 1	3	1	-	4	40	20	60	40	100
4.	DC	EE103	Basic Electrical Engineering	3	1	-	4	40	20	60	40	100
5.	DC	EC101	Basic Electronics	3	1	-	4	40	20	60	40	100
6.	DC	PY104	Physics Lab	-	-	2	1	30	30	60	40	100
7.	DC	EE104	Electrical Engineering Lab	-	-	2	1	30	30	60	40	100
8.	DC	ME103	Engineering Graphics	-	-	2	1	30	30	60	40	100
9.	DC	ME104	Workshop Practice	-	1	2	2	30	30	60	40	100
Total				14	6	8	24	320	220	540	360	900

** A non credit foundation course. Candidate has to pass the course by securing at least 50 % marks up to second semester

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 Sciences

DC – Departmental Core

HM – Humanities

OE – Open Elective

DE – Departmental Elective

ESA – Engineering Sciences & Arts (Foundation Course & Engineering Courses)

PHYSICS (PY101)
(w.e.f. July 2017)

L T P
3 1 0

Unit I: Wave Optics

8

Methods of formation of coherent sources, Fresnel's Biprism, displacement of fringes, thin film interference, Newton's ring. Fraunhofer's diffraction at single slit, grating, Rayleigh's criterion of resolution, resolving power of grating.

Unit II: Optical Activity and Modern Optics

8

Production of plane polarized light by reflection and Double refraction, Nicol prism, Optical activity, 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 III: Properties of Matter and Relativistic Mechanics

8

Viscosity, Poiseulli's equation, Michelson-Morley experiment and its implications, Galilean transformation equations Lorentz transformation equations and their consequences, energy mass relation, relativistic kinetic energy.

Unit IV: Quantum Physics

8

Compton effect, basic postulates of quantum mechanics, Wave function and its physical admissibility, orthogonality of wavefunctions, normalization of wave functions, Heisenberg's uncertainty principle(no derivation) and its applications (non-existence of electron in nucleus, Bohr's radius), Schrodinger's equation and its application to free particle, particle in one dimensional box.

Unit V: Physics of Materials

8

Magnetic Properties: Magnetization, Origin of magnetic moment, dia, para and ferro magnetism, Langevin's theory for diamagnetic material, Phenomena of hysteresis and its applications.

Superconductors: Temperature dependence of resistivity in superconducting materials, Effect of magnetic field (Meissner effect), Temperature dependence of critical field, Type I and Type II superconductors, BCS theory (Qualitative), High temperature superconductors and Applications of Super-conductors.

Nano-Materials: Basic principle of nanoscience and technology, structure, properties and uses of Fullerene and Carbon nanotubes, Applications of nanotechnology.

Reference Books:

1. Fundamentals of Optics by Jenkins and White
2. Optical Fiber Communication by Gerd Keiser
3. Concepts of Modern Physics by Arthur Beiser
4. Introduction to Special Theory of Relativity by Robert Resnick
5. Quantum Physics by Eisberg
6. Introduction to Nanotechnology by Poole Owens, Wiley India
7. Solid State Physics by S.O. Pillai, New Age Publications

BASIC PROFESSIONAL COMMUNICATION (LN101)

L T P

3 1 0

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

Sugh Aljidi
13/2/24

ENGINEERING MATHEMATICS 1 (MT101)
(Revised w.e.f. session 2017-2018)

L T P
3 1 0

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, 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 of different types of functions, Laplace transform of derivatives and integrals, Unit step function, Laplace transform of periodic functions, Inverse Laplace transform, Convolution theorem, Applications to solve simple linear differential equations.

Unit-III :

Fourier Series and Partial Differential Equations

[9]

Periodic functions, Trigonometric series , Fourier series of period 2π , Euler's formulae, Even and odd functions, Functions having arbitrary period, Change of interval, Half range sine and cosine series

Introduction of partial differential equations, Solution of second order linear homogeneous partial differential equations with constant coefficients 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, Heat conduction equations up to two dimensions, Laplace equation.

Unit-V:

Basic Statistics and curve fitting

[7]

Mean, Median, Mode, Standard deviation and Variance, Method of least squares, Curve fitting of straight line and parabola.

Reference Books:

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

BASIC ELECTRICAL ENGINEERING (EE103)

L T P
3 1 0

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

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:

- 2.V.Deltoro, "Principle of Electrical Engg." PHI.
- 3.M.A Mallick, Dr. I. Ashraf, "Fundamental of Electrical Engg," Word Press, Lucknow.
- 4.A. Hussain, "Basic Electrical Engg" Dhanpat Rai & sons.
- 5.I J Nagrath, "Basic Electrical Engg" ,TMH

BASIC ELECTRONICS (EC101)

L T P
3 1 0

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 A_i , A_v , R_i , R_o 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 / Transfer Characteristics.

(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

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).

(8)

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

PHYSICS LAB (PY104)

L T P

0 0 2

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.

ELECTRICAL ENGINEERING LAB (EE104)

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0 0 2

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 & output 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.

ENGINEERING GRAPHICS (ME103)

L	T	P
0	0	2

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 Charoathar Publishing.
2. Laxmi Narayan V and Vaish W: A Text Book of Practical Geometry and Geometrical drawing.

WORKSHOP PRACTICE (ME104)

L T P
0 1 2

1. Machine Shop

- a. Study of tools and operations
- b. Plane turning
- c. Step turning
- d. Taper turning
- e. Threading
- f. Single point cutting tool grinding.

2. Fitting Bench Working Shop

- a. Study of tools and operations
- b. Simple exercises involving filing work.
- c. Making perfect male-female joint
- d. Simple exercises involving drilling/tapping/dieing

3. Black Smithy Shop

- a. Study of tools and operations
- b. Simple exercises based on black smithy operations such as upsetting drawing down, punching, bending, fullering and swaging

4. Welding Shop

- a. Study of tools and Operations
- b. Simple butt joint
- c. Lap Joint
- d. Oxy acetylene welding

5. Sheet Metal Shop

- a. Study of tools and Operations
- b. Making funnel complete with soldering.
- c. Fabrication of tool box, tray, electrical panel box etc.

6. Carpentry Shop

- a. Study of tools and Operations and carpentry joints.
- b. Simple exercise using jack plain.
- c. To prepare half lap corner joint, mortise and tennon joints.
- d. Simple exercise on woodworking lathe.

7. Foundry

- a. Making a mould using single piece pattern .
- b. Making a mould using two piece pattern
- c. Making a mould using a pattern with core print
- d. Melting Pouring and Making an Aluminium Casting.