

**Bhavan's Vivekananda College, Sainikpuri**  
**Autonomous College**  
**B.Sc. I Year Electronics Semester - I (Circuit Analysis)**  
**Monthwise Lesson Plan for 2015 -16**

Month	Number of Classes Scheduled	TOPIC	CLASSES STIPULATED	REMARKS
July	15	Periodic waveform - Sinusoid, time period, frequency, peak, average & RMS values, form factor	3	
		phase and phase difference; the operator 'j', phasor diagram, phasor representation of sinusoidal currents and voltages	1	
		Exponential function, unit step, ramp & Impulse functions.	2	
		V-I relationship in circuits containing R, L, C	2	
		Impedance and admittance	1	
		series and parallel combinations of R, L and C	1	
		polar and rectangular forms of complex numbers	1	
		their applications to A.C Circuits	2	
		T and $\pi$ networks, conversions between them.	3	
August	15	Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current law (KCL)	2	
		solution of networks using Nodal analysis.	3	
		solution of networks using Mesh analysis.	2	
		Concept of voltage and current sources	1	
		Superposition Theorem	2	
		Thevenin's Theorem	2	
		Norton's Theorem	2	
		Maximum power transfer Theorem	1	
September	12	Millman's Theorem	1	
		Reciprocity Theorem	1	
		Transient response of RC circuit-charging and discharging of capacitor	2	
		Transient response of RL circuit - rise and decay of currents	2	
		Time constants	1	
		Filters - Low pass filter	1	
		High pass filter	1	
		Band Pass filter, Band Elimination filter	2	
		cutoff Frequency	1	
Differentiating response of RC and RL circuits	1			
October	12	Integrating response of RC and RL circuits	2	
		Series resonance in RLC circuit ,Q factor – band width – Selectivity.	4	
		Parallel resonance in RLC circuit, Q factor – band width – Selectivity.	3	
		CRT (Cathode Ray Tube)	1	
		CRO operation, voltage sweep operation, synchronizing & triggering	2	
		measurement using calibrated CRO scales, measurement of amplitude, time period, frequency, pulse width	2	
		phase - Lissajous figures	2	

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**Bhavan's Vivekananda College, Sainikpuri**  
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**B.Sc. I Year Electronics Semester - II (Semiconductor Devices)**  
**Monthwise Lesson Plan for 2015 -16**

Month	Number of Classes Sheduled	TOPIC	CLASSES STIPULATED	REMARKS
Dec	14	Review of basics of semiconductor physics, Continuity equation	5	
		Diode equation - PN Junction	5	
		Zener, Varactor, Tunnel diodes	6	
Jan	14	PNP and NPN transistors	3	
		BJT static characteristics in CB, CC, CE configurations	3	
		transistor as an amplifier in CE configuration	1	
		h-parameters	4	
		Load line analysis - Transistor Biasing	5	
Feb	14	Construction and working of JFET, application as VVR	7	
		MOSFET - modes of operation	4	
		Construction and working of UJT, characteristics	2	
		application of UJT as a relaxation oscillator.	1	
Mar	10	Construction and working of SCR - characteristics	3	
		applications of SCR for power control	1	
		Construction and characteristics of LDR, LED photo diode and photo voltaic cell	10	

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**Electronics Paper-II**  
**Analog Circuits and Communications**  
**Unit-wise Lesson Plan for the academic year 2015-16**

Unit	Topic	No. of classes Stipulated	Classes stipulated	Remarks
I	Introduction - Diodes	6	30	
	rectifiers	6		
	filters	6		
	regulators	6		
	IC regulators and SMPS	6		
II	Transistor basics, Amplifiers	6	30	
	RC Coupled Amplifier	6		
	feedback	6		
	Operational amplifiers – char. differential amplifier	6		
III	Op amp applications	9	30	
	Waveform generators	8		
	IC 555 Timer & appl.s	8		
	Pspice	5		
IV	Modulation	6	30	
	Amplitude Modulation	6		
	Frequency modulation	6		
	Pulse modulation	6		
	Revision	6		

**Month-wise organizer for the academic year 2015-16**

Month	No. of classes scheduled	Topic proposed to be covered	No. of classes required	Remarks
June	13	Introduction, diodes P. S. – Rectifiers & Filters Regulators	5 5 3	
July	17	IC regulators, SMPS Transistor basics, Amplifiers RC Coupled Amplifier Feedback	3 4 6 4	
August	11	Op amp - differential amplifier, characteristics, basic circuits	6 5	
September	17	Op amp applications – Int., diff., comp, wave generators- Sine, square & triangular	10 7	
October	7	IC 555 Timer multivibrators using IC 555	7	
November	15	Pspice Communications - Need for modulation, AM , AM modulator & detector	3 6 6	
December	14	Frequency modulation, Ratio detector, PAM, PPM, PWM, PCM & DM	7 7	
January	6	Revision	5	

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**ELECTRONICS PAPER-III**  
**Digital Electronics and Microprocessors**  
**Month-wise organizer for the academic year 2015-16**

Month	No. of classes scheduled (extra classes)	Topic proposed to be covered	No. of classes required	Remarks
June	10(+2)	Number systems & Logic gates	4	
		Logic Families & characteristics	6	
		Boolean Algebra, Simplifications & Universal gates	2	
July	12(+2)	Simplification of Boolean expressions	2	
		Karnaugh maps, SOP, POS	4	
		Adders, Mux, Demux, Decoder	4	
		Flip flops	4	
August	12(+2)	Registers, Counters	9	
		Semiconductor Memories	3	
September	12	8085 Microprocessor Architecture, Pin Configuration	6	
		Timing Diagrams	4	
		Instruction set of 8085	2	
November	11(+2)	Instruction set & Addressing Modes	3	
		Assembly Language Programming	4	
		Stacks & Subroutines Programming examples	3	
December	9	Memory Organization & interfacing concepts	5	
		PPI(8255)	4	
		Keyboard(8279), Stepper motor, LED interfacing	5	
January	6	A/D & D/A converters	6	
	72		80	

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Electronics Paper IV				
Embedded systems & Applications				
Monthwise lesson plan for 2015-16				
Month	Number of Classes Sheduled	Topics	Classes Required- Topicwise	Remarks
JUN	10	Introduction to $\mu$ P- Evolution and Classification of $\mu$ C	5	
		Architecture of 8051: PC and DPTR, memory organization, PSW register, register banks and stack, Oscillator clock	7	
JULY	12	Pin diagram, Port organization, I/O programming	4	
		Addressing modes, Instruction set and programming , Programming examples	12	
AUG	12	Time delay generation, Time delay Calculation, generation of rectangular wave	6	
		Compare instruction, program for picking smallest/largest, sorting of numbers	4	
		Interrupts, Timer/Counter modules	6	
SEPT	12	Interfacing parallel ports	3	
		Interrupt priority Controller	3	
		Interfacing DAC and Generation of different types of wave forms	6	
OCT				
NOV	11	Interfacing ADC and Temperature measurement	6	
		Serial Communication modes & Protocols	5	
DEC	9	LCD interfacing	3	
		Stepper motor fundamentals and interfacing	3	
		Keyboard interfacing	3	
JAN	6	Revision	6	
	72		82	

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**PHYSICS- Semester II**  
**Waves and Oscillations**

**Month-wise organizer for the academic year 2015-2016**

Month	No. of classes scheduled	Topic proposed to be covered	Classes required	Remark
December	15	<b>Fundamental of vibration:</b> SHM and characteristics, eq of motion, compound pendulum, measurement of 'g' and 'η'	7	
		<b>Superposition of Harmonic motions</b> mutually perpendicular waves 1:1 and 1:2, lissajous figures and application	8	
January	14	<b>Damped Oscillations</b> Eq of motion, sol, logarithmic decrement, relaxation time and quality factor	7	
		<b>Forced oscillations-</b> Eq of motion, sol, amplitude and velocity resonance quality factor, sharpness and Band width for resonance.	8	
February	14	<b>Fourier analysis</b> of complex vibrations- square, saw tooth and triangular wave analysis	8	
		<b>Ultrasonics</b> –methods of production and applications	7	
March	14	<b>Transverse and Longitudinal Waves in strings</b> Transverse wave in a stretched string, wave equation, solution, modes of vibration, energy transport, transverse impedance. Reflection and transmission of waves.	7	
		<b>Vibrations of bars</b> Longitudinal vibrations in bars – wave equation, general solution.	8	

**PHYSICS- SEMESTER I**  
**Mechanics**

**Month-wise organizer for the academic year 2015-2016**

Month	No. of classes scheduled	Topic proposed to be covered	Classes stipulated	Remark
July	14	<b>Vector analysis-</b> Introduction Gradient of a scalar, Divergence and curl of a vector, Stokes. Gauss and green theorem.	10	
		<b>Newton's laws</b> –Laws of motion. System of variable mass-Motion of rocket, Motion under different forces.	5	
August	14	<b>Collisions-</b> Collisions in two and three dimensions impact parameter, scattering cross – section, Rutherford scattering,	7	
		<b>Central Forces</b> , characteristics, Keplers laws	8	
September	14	<b>Mechanics of rigid bodies-</b> Symmetric top and precessional motion, Gyroscope	8	
		<b>Mechanics of continuous media</b> Stress and strain relation, Elastic constants, Uniform and non uniform strains with examples, Poisson's ratio Relation between $y$ , $n$ , $k$ and $\sigma$ .	7	
October	10+2	<b>Frames of reference and transformation:</b> Frames of reference ,Galilean relativity, Michelson – Morley experiment,	8	
		<b>Consequences of relativistic transformations</b> Lorentz transformation, time dilation, length contraction, addition of velocities, position and velocity as four vectors, four momentum, mass – energy relation	7	

**Month-wise organizer for the academic year 2015-2016**

Month	No. of classes scheduled	Topic proposed to be covered	classes required	Remarks
June	8	<b>Thermodynamic Laws</b> - Introduction Carnot's engine and its efficiency, Second law of thermodynamics, Change in entropy in reversible & irreversible	8	
July	7	<b>Entropy - Applications</b> <b>Thermodynamic potentials and Maxwell's relations</b> Thermodynamic potentials, Derivation of Maxwell's relations, $C_p - C_v$ & $C_p/C_v$ Derivations. Joule Kelvin effect	7	
August	7	<b>Low temperature physics</b> Introduction – Joule Kelvin effect Joule Thomson cooling, Liquefaction of helium. Refrigeration, vapour compression type. Working of refrigerator and Air conditioning machines	6	
September	7	<b>Quantum theory of radiation</b> Black body-Ferry's black body. Wein's displacement law, Rayleigh-Jean's law. Quantum theory of radiation, Planck's law.	6	
October	2	Pyrometer types	2	
November	7+1	<b>Kinetic theory of gases-</b> Deduction of Maxwell's law of distribution. Transport Phenomena – thermal conductivity	8	
December	6+1	<b>Statistical thermodynamics –</b> Introduction-MBN distribution law	7	
January	4	<b>Statistical thermodynamics (continued)</b> Bose- Einstein ,Fermi-Dirac Distribution law, Black Body Radiation laws	4	

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**PAPER III --ELECTRICITY, ELECTROMAGNETISM & ELECTRONICS**

**Month-wise organizer for the academic year 2015-2016**

Month	No. of classes scheduled	Topic proposed to be covered	classes stipulated	Remarks
June	12+2	<b>Introduction- Basic Electronics</b> energy bands in solids, Intrinsic, extrinsic SC,p-n junction diode and Zener diode half and full wave rectifiers and filters p n p and n p n transistors,CB,CE and CC configurations.	4 4 4 4	
July	12+2	concept of negative and positive feed back,RC coupled amplifier, phase shift oscillator <b>digital principles</b> ( gates, adders) <b>Alternating and Varying currents</b> Growth and decay-LR, CR and LCR circuits. AC - pure R,C and L,	4 3 7	
August	12	<b>Alternating and Varying currents</b> RL, RC, LC. LCR series and parallel resonant circuit quality factor, bandwidth <b>Electrostatics</b> -Electric field and potential Gauss law and its applications	8 7	
September	12	<b>Capacitance and Dielectrics</b> Atomic view of dielectrics, Polarization and charge density, Relation between D,E, and P. Gauss law in dielectrics. capacitance of parallel plate condenser with and without dielectric, spherical and cylindrical capacitors, Electric energy stored in a condenser force between plates-condenser	7 8	
November	11	<b>Magnetostatics</b> :Magnetic induction (B) and field (H) permeability and susceptibility, Hysteresis loop <b>Moving charge in EM fields</b> Hall effect, cyclotron, synchrocyclotron and synchrotron Biot –Savart's law	5 7	
December	9 +2	B- straight long wire, circular current loop and solenoid. <b>EMI</b> -Faraday's law –Lenz's law Betatron –Ballistic galvanometer self and Mutual inductance	4 7	
January	6	<b>Maxwell's equations</b> :Maxwell's eqs- Integral & differential form Maxwell's wave equation, plane EM waves	7	

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Unit	Topic	Classes stipulated	Remarks
I	Atomic Spectra	25	
	Molecular Spectra		
II	Inadequacy of classical physics	25	
	Matter waves		
	Uncertainty Principle		
	Schrodinger Mechanics		
III	Nuclear Structure:	15	
	Alpha and Beta Decays:		
	Nuclear Reactions:		
	Nuclear Detectors		
IV	Crystal Structure:	25	
	X-ray Diffraction:		
	Nanomaterials:		
	Bonding in Crystals:		
	Magnetism and Superconductivity		

**Month-wise organizer for the academic year 2015-2016**

Month	No. of classes scheduled	Topic proposed to be covered	classes required	Remarks
June	12+1	Inadequacy of classical physics	4	
		Photo electric effect and Compton effect	5	
		De Broglie theory	4	
July	14	Heisenberg's Uncertainty Principle	2	
		Schrodinger Mechanics	10	
		Nuclear structure and models	2	
August	11+2	Nuclear models and Alpha Beta Decay ,	7	
		Nuclear Detectors and Nuclear Reaction	6	
September	12	Crystal Structure and X-ray diffraction	6	
		Nano materials	6	
November	11+2	Bonding in crystals, Magnetism-	3	
		properties, Superconductivity, BCS	5	
		theory, HiT <sub>C</sub> Super Conductor	5	
December	14+2	Atomic Spectra, Alkali spectra,	6	
		Alkaline earth spectra, Molecular	8	
		spectroscopy	2	
January	7+2	Molecular spectroscopy	6	
		Raman effect – applications	3	

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