

# ANNUAL CURRICULAR PLAN

YEAR: **2017-18 (I SEMESTER)**

PAPER: **I A**

NAME OF THE LECTURER: **DR ARS KUMAR ,DR. L. MALLESWARA RAO,P RAMAKRISHNA RAO&  
ASS JYOTHI**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
June	08	<b>Vector Analysis:</b> Scalar and vector fields, gradient of a scalar field and its physical significance. Divergence and curl of a vector field and related problems.		Vector Analysis	4	Yes					
July	16	<b>Vector Analysis:</b> Vector integration, line, surface and volume integrals. Stokes, Gauss and Greens theorems-simple applications <b>Mechanics of Particles</b> Laws of motion, Motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. <b>Collisions:</b> Collisions in two and three dimensions, concept of impact parameter, scattering cross-section, Rutherford scattering.		Vector Analysis	4	Yes		Assignment I	1	Yes	
				Mechanics of particles	6	Yes			1	Yes	
				Collisions	6	Yes		PPT –I	1	Yes	
August	16	<b>Mechanics of continuous media:</b> Elastic constants of isotropic solids and their relation. Poisson's ratio, Classification of beams, types of		Mechanics of continuous media	5	Yes		Student seminars I			

		bending, point load, distributed load, shearing force and bending moment, sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with an end load. <b>Central force:</b> Central forces – definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force.		Classification of beams	5	Yes					
				Central force	6	Yes		Assignment II			
								PPT –II			
September	16	<b>Planetary Motion:</b> Gravitational potential and gravitational field. motion under inverse square law, derivation of Kepler's laws. <b>Special theory of relativity :</b> Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, mass-energy relation.		Planetary Motion	8	Yes		Assignment III	1	Yes	
				Special theory of relativity	8	Yes		Student seminar II	1	Yes	
								Assignment IV	1	Yes	
October	04	<b>Mechanics of rigid bodies:</b> Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor. Eulers equation, precession of a top, Gyroscope. Precession of the equinoxes.		Mechanics of rigid bodies	4	Yes		Assignment V			

# ANNUAL CURRICULAR PLAN

YEAR: **2017-18 (I SEMESTER)**

PAPER: **I B**

NAME OF THE LECTURER: **DR ARS KUMAR, DR. L. MALLESWARA RAO & P.RAMAKRISHNA RAO**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
<b>Nov</b>	8	<p>Simple Harmonic oscillations: Simple harmonic oscillator, and solution of the differential equation– Physical characteristics of SHM, torsion pendulum, - measurement of rigidity modulus , compound pendulum, measurement of ‘g’, combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequency, Lissajous figures.</p> <p><b>Damped Oscillations:</b> Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time, quality factor.</p> <p><b>Forced Oscillations:-</b>Differential equations of forced oscillator and its solution, amplitude resonance, velocity resonance, sharpness of resonance. Electrical analogy for a simple oscillator.</p>		Simple Harmonic oscillations	12	Yes		Assignment I	1	Yes	
<b>Dec</b>	16			<b>Damped Oscillations</b>	08			PPT –I			
				<b>Forced Oscillations</b>	06	Yes		Assignment II	1		

<b>Jan</b>	16	<b>Complex vibrations:</b> Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave, triangular wave, saw-tooth wave.		<b>Complex vibrations</b>	08	Yes		Assignment III	1	Yes	
<b>Feb</b>	16	<b>Vibrating Strings:</b> Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at both ends, overtones, energy transport, transverse impedance <b>Longitudinal Vibration of bars:</b> Longitudinal vibrations in bars- wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point iii) bar free at both ends iv) bar fixed at one end.		<b>Vibrating Strings</b>  <b>Longitudinal Vibration of bars</b>	12  06	Yes  Yes		Assignment IV	1	Yes	
<b>Mar</b>	8	<b>Transverse Vibrations of bars:</b> Transverse vibrations in a bar – wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, tuning fork. <b>Ultrasonics :</b> Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves. Velocity of ultrasonic		<b>Transverse Vibrations of bars</b>  <b>Ultrasonics</b>	06  06	Yes  Yes		Assignment V  PPT –II	1	Yes	

		in liquids by sear's method. Applications of ultrasonic waves.									
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## ANNUAL CURRICULAR PLAN

YEAR: 2017-18 (V SEMESTER)

PAPER: IV A

NAME OF THE LECTURER: **Dr APV APPA RAO & DR. L. MALLESWARA RAO, DSDJ Swaroop**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
June	12	<b>Atomic and molecular physics:</b> Introduction –Drawbacks of Bohr’s atomic model- Sommerfeld’s elliptical orbits-relativistic correction (no derivation).Vector atom model and Stern-Gerlach experiment - quantum numbers associated with it. L-S and j-j coupling schemes.Zeeman effect and its experimental arrangement. <b>Raman effect</b> , hypothesis, Stokes and Anti Stokes lines. Quantum theory of Raman effect. Experimental arrangement – Applications of Raman effect. <b>Matter waves</b> :Matter waves, de Broglie’s hypothesis - wavelength of matter waves, Properties of matter waves - Davisson and Germer experiment – Phase and group		Atomic spectra	8	Yes		Assignment I			
				Raman effect	4	Yes		PPT-I			

[illegible]

September	12	<b>Radioactivity decay:</b> Alpha decay: basics of $\alpha$ -decay processes. Theory of $\alpha$ -decay, Gamow's theory, Geiger Nuttal law. $\beta$ -decay, Energy kinematics for $\beta$ -decay, positron emission, electron capture, neutrino hypothesis. <b>Crystal Structure:</b> Amorphous and crystalline materials, unit cell, Miller indices, reciprocal lattice, types of lattices, diffraction of X-rays by crystals, Bragg's law, experimental techniques, Laue's method and powder diffraction method.		Radioactivity decay  Crystal structure	12	Yes  Yes		Student seminar II  Assignment IV  PPT-II  Career Guidance	1	Yes	
October	06	<b>Superconductivity:</b> Introduction - experimental facts, critical temperature - critical field - Meissner effect – Isotope effect - Type I and type II superconductors - BCS theory (elementary ideas only) - applications of superconductors.		Schrodinger Wave Equation	6	Yes		Assignment V  Career Guidance			

## ANNUAL CURRICULAR PLAN

YEAR: **2017-18 (VI SEMESTER)**

PAPER: **VII C**

NAME OF THE LECTURER: **DR APV APPA RAO & ASS JYOTHI**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate	Activity	Hours Alloted	Whether Conducted	If not Alternate

							Date				Date
Nov	6	<b>Introduction to Energy:</b> Definition and units of energy, power, Forms of energy, Energy flow diagram to the earth. Role of energy in economic and social development <b>Environmental Effects:</b> Environmental degradation due to energy production and utilization, air and water pollution, depletion of ozone layer, global warming, biological damage due to environmental degradation.			9	Yes		Assignment I	1	Yes	
Dec	12							Student seminar I	1	Yes	
Jan	12	<b>Global Energy Scenario:</b> Energy consumption in various sectors, energy resources, coal, oil, natural gas, nuclear and hydroelectric power. <b>Indian Energy Scene:</b> Energy resources available in India, urban and rural energy consumption, nuclear energy - promise and future, energy as a factor limiting growth, need for use of new and renewable energy sources. <b>Solar energy:</b> Solar energy, Spectral distribution of radiation, solar water heating system, Applications, Solar cooker. Solar cell, Types of solar cells.			9	Yes		Assignment II	1	Yes	
					9	Yes		PPT I	1	Yes	
								Assignment III	1	Yes	
								Career Guidance Class	1	Yes	
Feb	12	<b>Wind Energy:</b> Introduction, Principle of wind energy conversion, and Components of wind turbines, Operation and characteristics of a wind turbine, Applications of wind energy. <b>Ocean Energy:</b> Introduction, Principle of ocean thermal energy conversion, Tidal power generation, Tidal energy technologies, Energy from waves, <b>Hydrogen Energy:</b> History of hydrogen energy-Hydrogen production methods-Electrolysis of water, uses of hydrogen as fuel			9	Yes		Assignment IV	1	Yes	
								PPT II	1	Yes	
					9	Yes		Student seminar II	1	Yes	



Mar	06	<b>.Bio-Energy:</b> Energy from biomass – Sources of biomass –Conversion of biomass into fuels – Energy through fermentation – Pyrolysis, gasification and combustion – Aerobic and anaerobic bio-conversion – Properties of biomass –Properties and characteristics of biogas.			06	Yes		Assignment V Career Guidance Class	1  1	Yes  Yes	
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## ANNUAL CURRICULAR PLAN

YEAR: **2017-18 (VI SEMESTER)**

PAPER: **VIII C 1**

NAME OF THE LECTURER: **P RAMAKRISHNA RAO**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
Nov	6	<b>Basics of Solar Radiation:</b> Structure of Sun, Solar constant, Concept of Zenith angle and air mass, Definition of declination, hour angle, solar and surface azimuth angles; Direct, diffuse and total solar radiation, Solar intensity measurement – pyrhelimeter.			9	Yes		Assignment I	1	Yes	
Dec	12							Student seminar I	1	Yes	
Jan	12	<b>Radiative Properties and Characteristics of Materials:</b> Kirchoff's law – Relation between absorptance, emittance and reflectance; Selective Surfaces - preparation and characterization, Types and applications; Anti-reflective coating. <b>Flat Plate Collectors (FPC) :</b> Description of flat plate collector, Liquid heating type FPC, Energy balance equation, Efficiency, Temperature			9	Yes		Assignment II	1	Yes	
								PPT I	1	Yes	
					9	Yes		Assignment III	1	Yes	
								Career Guidance	1	Yes	



							Date				Date
Nov	6	<b>Introduction:</b> Wind generation, meteorology of wind, world distribution of wind, wind speed variation with height, wind speed statistics, Wind energy conversion principles; General introduction; Types and classification of WECS; Power, torque and speed characteristics.			9	Yes		Assignment I	1	Yes	
Dec	12							Student seminar I	1	Yes	
Jan	12	<b>Wind Energy Conversion System:</b> Aerodynamic design principles; Aerodynamic theories; axial momentum, blade element; Rotor characteristics; Maximum power coefficient. <b>Wind Energy Application:</b> Wind pumps: Performance analysis, design concept and testing; Principle of wind energy generation; Wind energy in India; Environmental Impacts of Wind farms.			9	Yes		Assignment II	1	Yes	
					9	Yes		PPT I	1	Yes	
								Assignment III	1	Yes	
								Career Guidance Class	1	Yes	
Feb	12	<b>Small Hydropower Systems:</b> Overview of micro, mini and small hydro systems; Hydrology; Elements of pumps and turbine; Selection and design criteria of pumps and turbines; Site selection; Speed and voltage regulation. <b>Ocean Thermal, Tidal and Wave Energy Systems:</b> Ocean Thermal - Introduction, Technology process, working principle, Electricity generation methods from OCET, Advantages and disadvantages, Applications of OTEC.			9	Yes		Assignment IV	1	Yes	
								PPT II	1	Yes	
					9	Yes		Student seminar II	1	Yes	
Mar	06	<b>Tidal Energy</b> - Introduction, Origin and nature of tidal energy, Wave Energy – Introduction, Basics of wave motion, Power in waves, Wave energy conversion devices, Advantages and disadvantages, Applications of wave energy.			05	Yes		Assignment V	1	Yes	
								Career Guidance Class	1	Yes	

# ANNUAL CURRICULAR PLAN

YEAR: **2017-18 (VI SEMESTER)**

PAPER: **VIII C3**

NAME OF THE LECTURER: **DR L MALLESWARA RAO**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
Nov	6	<b>Energy Storage:</b> Need of energy storage; Different modes of energy storage, Flywheel storage, Electrical and magnetic energy storage: Capacitors, electromagnets; Chemical Energy storage: Thermo-chemical, photo-chemical, electro-chemical, Hydrogen for energy storage.			9	Yes		Assignment I	1	Yes	
Dec	12							Student seminar I	1	Yes	
Jan	12	<b>Electrochemical Energy Storage Systems:</b> Batteries: Primary, Secondary, Lithium, Solid-state and molten solvent batteries; Lead acid batteries; Nickel Cadmium Batteries; Advanced Batteries. Role of carbon nano-tubes in electrodes. <b>Magnetic and Electric Energy Storage Systems:</b> Superconducting Magnet Energy Storage (SMES) systems; Capacitor and battery: Comparison and application; Super capacitor:			9	Yes		Assignment II	1	Yes	
								PPT I	1	Yes	
					9	Yes		Assignment III	1	Yes	
								Career Guidance Class	1	Yes	
Feb	12	<b>Fuel Cell:</b> Fuel cell definition, difference between batteries and fuel cells, fuel cell components, principle and working of fuel cell, performance characteristics, efficiency. Advantages and disadvantages of fuel cell.			9	Yes		Assignment IV	1	Yes	
								PPT II			
								Student seminar II	1	Yes	



July	16	<p>Principle of superposition – coherence– conditions for Interference of light.</p> <p><b>Interference by division of wave front:</b> Fresnel’s biprism – determination of wave length of light -- Determination of thickness of a transparent material using Biprism – change of phase on reflection – Lloyd’s mirror experiment.</p> <p><b>Interference by division of amplitude:</b> Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) – Colours of thin films – Non reflecting films -- Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) – Determination of diameter of wire. Newton’s rings in reflected light with contact between lens and glass plate – Determination of wave length of monochromatic light – Michelson Interferometer – types of fringes – Determination of wavelength of monochromatic light and thickness of a thin transparent plate.</p>	.	Interference	15	YES		<p>Assignment II</p> <p>Seminar</p> <p>Assignment III</p>	<p>1 hour</p> <p>1 Hour</p> <p>1 Hour</p>	<p>YES</p> <p>YES</p> <p>YES</p>	
August	16	<p><b>Polarization:-</b> Polarized light : Methods of Polarization, Polarization by reflection, refraction, Double refraction, scattering of light – Brewsters law – Malus law – Nicol prism as polarizer and analyzer – Refraction of plane wave incident on negative crystals (Huygen’s explanation) – Quarter wave plate, Half wave plate– Optical activity,</p>		Polarization	08	YES		Seminar	1 hour	YES	

		analysis of light by Laurent's half shade polarimeter. <b>Lasers :</b> Introduction – Spontaneous emission – Stimulated emission – Population inversion. Laser principle– Types of Lasers – He-Ne laser – Ruby laser – Semi conductor laser -- Laser characteristics -- Applications of lasers.		<b>Lasers</b>	09	YES					
September	16	<b>Fiber Optics and Holography:</b> Introduction – Optical fibers – Types of optical fibers – Step and graded index fibers –Fiber material – Principles of fiber communication (qualitative treatment only) -- advantages of fiber communication. Basic Principle of Holography and its applications. Gabor hologram. <b>Diffraction:</b> Introduction – <b>Fraunhofer diffraction:-</b> Diffraction due to single slit– Limit of resolution – Fraunhofer diffraction due to double slit – Fraunhofer diffraction pattern with N slits (diffraction grating). Resolving Power of grating – Determination of wave length of light in normal and oblique incidence methods using diffraction grating.		Fiber Optics & Holography	05	Yes		Assignment-IV	1 hour	YES	
				Diffraction	08	YES		Assignment V	1hour	YES	
October	8	<b>Fresnel diffraction</b> -- Fresnel's half		Fresnel	08	YES					

		period zones – area of the half period zones –zone plate – Comparison of zone plate with convex lens – Phase reversal zone plate – difference between interference and diffraction. Distinction between Fresnel and Fraunhofer diffraction.		Diffraction							

## ANNUAL CURRICULAR PLAN I/III/V

YEAR: **2017-18**

PAPER: V

NAME OF THE LECTURER: **Sri J Rama Mohan, Sri P Ramakrishna Rao & ASS Jyothi**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
June	12	<b>Electric field intensity and potential:</b> Gauss's law statement and its proof- Electric field intensity due to (1) Uniformly charged sphere and (2) an infinite conducting sheet of charge. Electrical potential – equipotential surfaces- potential due to i) a point charge, ii) charged spherical shell .		Electrostatics	8	YES		Assignment I	1	YES	
				Dielectrics	6	YES					
July	12	<b>Dielectrics:</b> Electric dipole moment and molecular polarizability- Electric displacement D, electric polarization P –		Capacitance	10	YES		Assignment	1	YES	





		characteristics, Transistor as an amplifier. <b>Digital electronics:</b> Number systems - Conversion of binary to decimal system and vice versa. Binary subtraction (2's complement methods). Laws of Boolean algebra - De Morgan's laws- statement and proof, Basic logic gates, NAND and NOR as universal gates, exclusive-OR gate, Half adder and Full adder.									

## ANNUAL CURRICULAR PLAN II/IV/VI

YEAR: **2017-18**

PAPER: **IV**

NAME OF THE LECTURER: **Dr A P V Appa Rao, Sri J Rama Mohan & GS Devi**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
December	15	<b>Kinetic theory of gases:</b> Introduction – Deduction of Maxwell's law of distribution of molecular speeds, Transport Phenomena – Viscosity of gases – thermal conductivity – diffusion of gases.		Transport Phenomena	01	YES					

		<b>Thermodynamics :</b> Introduction – Reversible and irreversible processes – Carnot's engine and its efficiency – Carnot's theorem – Second law of thermodynamics, Kelvin's and Clausius statements – Thermodynamic scale of temperature.		Carnot's engine and it's efficiency	01	YES		Assignment I	1	YES	
January	15	<b>Entropy:-</b> Entropy, physical significance – Change in entropy in reversible and irreversible processes – Entropy and disorder – Entropy of universe – Temperature-Entropy (T-S) diagram. Change of Entropy of a perfect gas – Change of entropy when ice changes into steam. <b>Thermodynamic potentials and Maxwell's equations:</b> Thermodynamic potentials – Derivation of Maxwell's thermodynamic relations – Clausius-Clayperon's equation – Derivation for ratio of specific heats – Derivation for difference of two specific heats for perfect gas. Joule Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas.		Change of Entropy of a perfect gas	07	YES		Assignment II	1 hour	YES	
				Clausius-Clayperon's equation	08	YES		Seminar	1 Hour	YES	
February	15	<b>Low temperature Physics:</b> Introduction – Joule Kelvin effect – liquefaction of gas using porous plug		Adiabatic	15	YES		Assignment	1 hour	YES	

		<p>experiment. Joule expansion – Distinction between adiabatic and Joule Thomson expansion – Expression for Joule Thomson cooling – Liquefaction of helium, Kapitza's method – Adiabatic demagnetization – Production of low temperatures – Principle of refrigeration, vapour compression type. Working of refrigerator and Air conditioning machines. Effects of Chloro and Fluro Carbons on Ozone layer.</p>		<p>demagnetization Production of low temperatures</p>				IV				
March	15	<p><b>Quantum theory of radiation:</b> Black body-Ferry's black body – distribution of energy in the spectrum of Black body – Wein's displacement law, Wein's law, Rayleigh-Jean's law – Quantum theory of radiation - Planck's law – deduction of Wein's law and Rayleigh-Jeans law from Planck's law - Measurement of radiation – Earth as a Black Body. Types of pyrometers – Disappearing filament optical pyrometer – experimental determination – determination of solar constant, effective temperature of sun.</p>		<p>Disappearing filament optical pyrometer – experimental determination</p>	15	Yes		Assignment V	1 hour	YES		

# ANNUAL CURRICULAR PLAN

YEAR: **2017-18**

PAPER: **VII**

NAME OF THE LECTURER: **Dr A PV Appa Rao, J Rama Mohan, Dr L Malleswara Rao  
Sri P Ramakrishna Rao, ASS Jyothi & GS Devi**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
December	12	<b>Introduction to Energy:</b> Definition and units of energy, power, Forms of energy, Energy flow diagram to the earth. Role of energy in economic and social development. <b>Environmental Effects:</b> Environmental degradation due to energy production and utilization, air and water pollution, depletion of ozone layer, global warming, biological damage due to environmental degradation.		Role of energy in economic and social development.	01	YES		Assignment	1	YES	
January	12	<b>Global Energy Scenario:</b> Energy consumption in various sectors, energy resources, coal, oil, natural gas, nuclear and hydroelectric power. <b>Indian Energy Scene:</b> Energy resources available in India, urban and rural energy consumption, nuclear energy - promise and future, energy as a factor limiting growth, need for use of new and renewable energy sources.		Energy resources available in India	01	YES		Assignment	1	YES	
February	12	<b>Solar energy:</b> Solar energy, Spectral distribution of radiation, solar water heating system, Applications, Solar cooker. Solar		Solar energy,	01	YES		Assignment	01	YES	



