YEAR: 2017-18 (I SEMESTER)

PAPER: IA

NAME OF THE LECTURER: DR ARS KUMAR , DR. L. MALLESWARA RAO, PRAMAKRISHNA RAO&

ASS JYOTHI

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions		Curricul	ar Activity			Co-Curri	cular Activity	
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
June	08	Vector Analysis: 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	Vector Analysis: Vector integration, line, surface and volume integrals. Stokes, Gauss and Greens theorems- simple applications Mechanics of Particles		Vector Analysis	4	Yes		Assignment I	1	Yes Yes	
		Laws of motion, Motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum.		Mechanics of particles	6	Yes			1	Yes	
		Collisions: Collisions in two and three dimensions, concept of impact parameter, scattering cross-section, Rutherford scattering.		Collisions	6	Yes		PPT –I	1	Yes	
August	16	Mechanics of continuous media: 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. Central force: 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 Central force	5	Yes Yes	Assignment II PPT –II			
September	16	PlanetaryMotion:Gravitationalpotentialandgravitationalfield.motionunderinversesquarelaw,derivationofKepler'slaws.Specialtheory ofrelativity:Galileanrelativity,absoluteframes,Michelson-Morleyexperiment,Postulatesofspecialtheoryofrelativity.Lorentztransformation,timedilation,lengthcontraction,mass-energyrelation. </td <td>Planetary Motion Special theory of relativity</td> <td>8</td> <td>Yes</td> <td>Assignment III Student seminar II Assignment IV</td> <td>1 1 1</td> <td>Yes Yes</td> <td></td>	Planetary Motion Special theory of relativity	8	Yes	Assignment III Student seminar II Assignment IV	1 1 1	Yes Yes	
October	04	Mechanics of rigid bodies: 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			

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		Curricula	r Activity			Co-Curricu	Ilar Activity	
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
Nov Dec	8	Simple Harmonic oscillations: Simple harmonic oscillator, and solution of the differential equation– Physical characteristics of SHM, torsion		Simple Harmonic oscillations	12	Yes		Assignment I PPT –I	1	Yes	
		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.									
		Damped Oscillations: Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time,		Damped Oscillations	08			Assignment II			
		quality factor.ForcedOscillations:-Differentialequations of forced oscillator and itssolution, amplitude resonance, velocityresonance, sharpness of resonance.Electrical analogy for a simple oscillator.		Forced Oscillations	06	Yes		1		Yes	

Jan	16	Complex vibrations: Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave, triangular wave, saw-tooth wave.	Complex vibrations	08	Yes	Assignment III	1	Yes	
Feb	16	Vibrating Strings: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 impedanceLongitudinalVibration of bars: 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.	Vibrating Strings Longitudinal Vibration of bars	12	Yes	Assignment IV	1	Yes	
Mar	8	TransverseVibrationsofbars:TransverseVibrations in a bar – wave equation and its general solution.Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, tuning fork.Ultrasonics :Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magneto striction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves.	Transverse Vibrations of bars Ultrasonics	06	Yes	Assignment V PPT –II	1	Yes	

in liquids by sear's method. Applications				
of ultrasonic waves.				

YEA	AR: 2017-18	3 (V SEMESTER) PAP	ER: IV A	NAM	ME OF THE L	ECTURER: Dr	APV APPA RAO	& DR. L. MALLE	SWARA RA	O, DSDJ Swaro	ор
Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions		Curricu	llar Activity			Co-Curric	ular Activity	
				Activity	Hours Allotted	Whether Conducted	lf not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
June	12	Atomic and molecular physics: 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. Raman effect , hypothesis, Stokes and Anti Stokes lines. Quantum theory of Raman effect. Experimental arrangement – Applications of Raman effect. Matter waves : Matter waves, de Broglie's hypothesis - wavelength of matter waves, Properties of matter waves - Davisson and Germer experiment – Phase and group		Atomic spctra Raman effect	8	Yes		Assignment I PPT-I			

		velocities.							
July	12	Uncertainty Principle Heisenberg's uncertainty principle for position and momentum (x and p), &	Uncertainty Principle	8	Yes	Assignment II	1	Yes	
		energy and time (E and t). Experimental verification - Complementarity principle of Bohr.					1	Yes	
		Quantum (wave) mechanicsBasic postulates of quantummechanics-Schrodinger	Quantum mechanics	4	Yes	Seminar I	1	Yes	
		independent and time dependent wave equations-derivations. Physical interpretation of wave function. Eigen functions, Eigen values. Application of Schrodinger wave equation to particle in one dimensional infinite box				Guest Lecture	1	Yes	
August	12	General Properties of Nuclei Basic ideas of nucleus -size, mass, charge density (matter energy), binding energy, angular momentum, parity, magnetic moment, electric moments. Liquid drop model and Shell model (qualitative aspects only) - Magic numbers.	General properties	12	Yes	PPT-II Assignment III	1	Yes	

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

Y	(EAR: 2017	-18 (VI SEMESTER)	PAPER: VII C	NAM	E OF THE L	ECTURER:	DR APV APPA	A RAO & ASS JYC	ТНІ			
Month & Week	Hours available	Syllabus Topic		Additional Inputs / Value Additions		Curri	cular Activity			Co-Curricu	ılar Activity	
					Activity	Hours	Whether	If not	Activity	Hours	Whether	If not
						Allotted	Conducted	Alternate		Alloted	Conducted	Alternate

						Date				Date
Nov Dec	6 12	Introduction to Energy: Definition and units of energy, power, Forms of energy, Energy flow diagram to the earth. Role of energy in economic and social development Environmental Effects: 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 Student seminar I	1	Yes Yes	
Jan	12	 Global Energy Scenario: Energy consumption in various sectors, energy resources, coal, oil, natural gas, nuclear and hydroelectric power. Indian Energy Scene: 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. Solar energy: Solar energy, Spectral distribution of radiation, solar water heating system, Applications, Solar cooker. Solar cell, Types of solar cells. 		9	Yes		Assignment II PPT I Assignment III Career Guidance Class	1 1 1	Yes Yes Yes Yes	
Feb	12	 Wind Energy: Introduction, Principle of wind energy conversion, and Components of wind turbines, Operation and characteristics of a wind turbine, Applications of wind energy. Ocean Energy: Introduction, Principle of ocean thermal energy conversion, Tidal power generation, Tidal energy technologies, Energy from waves, Hydrogen Energy: History of hydrogen energy-Hydrogen production methods-Electrolysis of water, uses of hydrogen as fuel 		9	Yes		Assignment IV PPT II Student seminar II	1 1 1	Yes Yes Yes	

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

•	YEAR: 201	7-18 (VI SEMESTER) PAPER: VIII C	1 NAME	E OF THE L	ECTURER:	P RAMAKRIS	HNA RAO				
Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions		Curri	cular Activity			Co-Curricı	Ilar Activity	
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	lf not Alternate Date
Nov Dec	6	Basics of Solar Radiation: 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 – pyrheliometer.			9	Yes		Assignment I Student seminar I	1	Yes Yes	
Jan	12	 Radiative Properties and Characteristics of Materials: Kirchoff's law – Relation between absorptance, emittance and reflectance; Selective Surfaces - preparation and characterization, Types and applications; Anti-reflective coating. Flat Plate Collectors (FPC) : Description of flat plate collector, Liquid heating type FPC, Energy 			9 9	Yes		Assignment II PPT I Assignment III	1 1 1	Yes Yes Yes	
		balance equation, Efficiency, Temperature						Career Guidance	1	Yes	

		distribution in FPC, Definitions of fin efficiency			Class			
		and collector efficiency, Evacuated tubular						
		collectors.						
Feb	12	Solar photovoltaic (PV) cell: Physics of solar cell	9	Yes	Assignment	1	Yes	
		-Type of interfaces, homo, hetero and schottky			IV			
		interfaces, Photovoltaic Effect, Equivalent circuit						
		of solar cell, Solar cell output parameters, Series			PPT II	1	Yes	
		and shunt resistances and its effect on cell						
		efficiency; Variation of efficiency with band-gap						
		and temperature.				1	Yes	
		Solar PV systems: Solar cell module assembly –	9	Yes	Student	1	Tes	
		Steps involved in the fabrication of solar module,			seminar II			
		Module performance, I-V characteristics, Modules						
		in series and parallel, Module protection, Solar PV						
		system and its components, PV array, inverter,						
		battery and load.						
Mar	06	Solar thermal applications: Solar hot water	06	Yes	Assignment V	1	Yes	
		system (SHWS), Types of SHWS, Standard			Career			
		method of testing the efficiency of SHWS; Passive			Guidance	1	Yes	
		space heating and cooling concepts, Solar			Class			
		desalinator and drier, Solar thermal power						
		generation.						

	YEAR: 2017	7-18 (VI SEMESTER)	PAPER: VIII C 2 N	AME OF THE I	LECTURER:	J RAMA MOH	IAN				
Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions		Curr	icular Activity			Co-Curricı	ılar Activity	
				Activity	Hours	Whether	If not	Activity	Hours	Whether	If not
					Allotted	Conducted	Alternate		Alloted	Conducted	Alternate

					Date				Date
Nov Dec	6	Introduction: 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 Student seminar I	1	Yes Yes	
Jan	12	 Wind Energy Conversion System: Aerodynamic design principles; Aerodynamic theories; axial momentum, blade element; Rotor characteristics; Maximum power coefficient. Wind Energy Application: 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 PPT I Assignment III Career Guidance Class	1 1 1 1	Yes Yes Yes Yes	
Feb	12	Small Hydropower Systems: 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.Ocean Thermal, Tidal and Wave Energy Systems: Ocean Thermal - Introduction, Technology process, working principle, Electricity generation methods from OCET, Advantages and disadvantages, Applications of OTEC.	9	Yes		Assignment IV PPT II Student seminar II	1 1 1	Yes Yes Yes	
Mar	06	Tidal Energy - 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 Career Guidance Class	1	Yes Yes	

	YEAR: 201	7-18 (VI SEMESTER) PAPER: N	/III C3	NAME	OF THE LEC	TURER: DR L	MALLESWARA	RAO			
Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions		Curr	icular Activity			Co-Curricu	ılar Activity	
				Activity	Hours Allotted	Whether Conducted	lf not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
Nov Dec	6 12	Energy Storage: Need of energy stora Different modes of energy storage, Flywl storage, Electrical and magnetic energy stora Capacitors, electromagnets; Chemical Ene storage: Thermo-chemical, photo-chemi electro-chemical, Hydrogen for energy storage.	neel nge: rgy		9	Yes		Assignment I Student seminar I	1	Yes Yes	
Jan	12	Electrochemical Energy Storage System Batteries: Primary, Secondary, Lithium, Solid-s and molten solvent batteries; Lead acid batter Nickel Cadmium Batteries; Advanced Batter Role of carbon nano-tubes in electrodes. Magnetic and Electric Energy Storage System Superconducting Magnet Energy Storage (SM systems; Capacitor and battery: Comparison application; Super capacitor:	tate ies; ies. ms: ES)		9	Yes		PPT I Assignment III Career Guidance	1 1 1 1	Yes Yes Yes Yes	
Feb	12	Fuel Cell: Fuel cell definition, difference betw batteries and fuel cells, fuel cell compone principle and working of fuel cell, performa characteristics, efficiency. Advantages disadvantages of fuel cell.	nts,		9	Yes		Class Assignment IV PPT II Student seminar II	1 1 1	Yes Yes Yes	

Mar	Types of Fuel Cells: Classification, Alkaline fuel cell, phosphoric acid fuel cell, molten carbonate fuel cell; solid oxide fuel cell, applications of fuel cells.		05	Yes	Assignment V Career Guidance Class	1 1	Yes Yes	

ANNUAL CURRICULAR PLAN I/III/V

YE	EAR: 2017-	18 PAPER:	111	NAM	IE OF THE	LECTURER:	Dr A P V /	Appa Rao S	ri J Rama	a Mohan&	GS Devi
Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions		Curricular	Activity			Co-Curricu	ular Activity	
				Activity	Hours Allotted	Whether Conducted	lf not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
June	16	Aberrations: Introduction to Chromatic aberration – calculation of longitudinal chromatic aberration of a thin lens – achromatism for two lenses (a) when in contact and (b) when separated by a distance – achromatism of a camera lens – Introduction to Spherical aberration – minimization of spherical aberration – Coma Astigmatism Curvature of field – distortion.		Matrix methods in Paraxial Optics. Aberrations	10 05	YES		Assignment I			
		Interference									

		Principle of superposition – coherence–							[]
July	16	conditions for Interference of light.							
July	10	Interference by division of wave front:	Interference	15	YES	Assignment	1 hour	YES	
		Fresnel's biprism – determination of	interierence	15	TLS	I	Inour	TLS	
		wave length of light Determination of							
		thickness of a transparent material using							
		Biprism – change of phase on reflection							
		– Lloyd's mirror experiment.							
		Interference by division of amplitude:							
		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				Seminar	1 Hour	YES	
		Interference by a film with two non-							
		parallel reflecting surfaces (Wedge							
		shaped film) – Determination of							
		diameter of wire. Newton's rings in				Assignment	1 Hour	YES	
		reflected light with contact between				111			
		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.							
	10								
August	16	Polarization:-		00	VEC	Caminan			
		Polarized light : Methods of Polarization,	Polarization	08	YES	Seminar	1	VEC	
		Polarization by reflection, refraction,					1 hour	YES	
		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,							

		analysis of light by Laurent's half shade polarimeter. Lasers : 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.	Lasers	09	YES			
September	16	Fiber Optics and Holography: 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. Diffraction: Introduction – Fraunhoffer diffraction:- Diffraction due to single slit– Limit of resolution – Fraunhoffer diffraction due to double slit – Fraunhoffer 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 Diffraction	05 08	Yes	Assignment- IV Assignment 1hour V	YES	
October	8	Fresnel diffraction 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 Fraunhoffer 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 &	Hours	Syllabus Topic	Additional								
Week	available		Inputs / Value		Curricular	Activity			Co-Curricu	lar Activity	
			Additions								
				Activity	Hours	Whether	If not	Activity	Hours	Whether	If not
					Allotted	Conducted	Alternate		Allotted	Conducted	Alternate
							Date				Date
June	12	Electric field intensity and potential:									
		Gauss's law statement and its proof- Electric		Electrostatics	8	YES		Assignment	1	YES	
		field intensity due to (1) Uniformly charged						1			
		sphere and (2) an infinite conducting sheet									
		of charge. Electrical potential – equi									
		potential surfaces- potential due to i) a									
		point charge, ii) charged spherical shell .		Dielectrics	6	YES					
		Dielectrics: Electric dipole moment and									
July	12	molecular polarizability- Electric									
		displacement D, electric polarization P -		Capacitance	10	YES		Assignment	1	YES	

		relation between D, E and P- Dielectric constant and susceptibility. Boundary conditions at the dielectric surface.				11		
August	12	Electric and magnetic fieldsBiot-Savart'slaw, explanation andcalculation of B due to long straight wire, acircular current loop and solenoid – Halleffect – determination of Hall coefficientand applications.Electromagnetic inductionFaraday's law-Lenz's law- Self and mutualinductance, coefficient of coupling,calculation of self inductance of a longsolenoid, energy stored in magnetic field.Transformer - energy losses - efficiency.	Magnetostatics	10	YES	Assignment- III	01 Hour	YES
September	12	Alternating currents and electromagnetic waves Alternating current - Relation between current and voltage in LR and CR circuits, vector diagrams, LCR series and parallel resonant circuit, Q –factor, power in ac	Moving charges in electric and magnetic fields	8	YES	Seminar	02 Hours	YES
		circuits. Maxwell's equations :Idea of displacement current - Maxwell's equations (integral and differential forms) (no derivation), Maxwell's wave equation (with derivation). Pointing theorem (statement), production of electromagnetic waves (Hertz experiment).	Electromagnetic Induction	4	YES	Assignment IV	01 Hour	YES
October	6	Basic electronics:PN junction diode, Zener diode, I-Vcharacteristics, PNP and NPN transistors,CB, CE and CC configurations – Relationbetween α , β and γ - transistor (CE)	Electromagnetic Induction	6	YES	Assignment V	1	YES

characteristics, Transistor as an amplifier.					
Digital electronics:					
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

YE	YEAR: 2017-18 PAPER:			NAME	E OF THE L	ECTURER:	Dr A P V A	Appa Rao, Si	ri J Rama	a Mohan &	GS Devi	
Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity					Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	lf not Alternate Date	Activity	Hours Allotted	Whether Conducted	lf not Alternate Date	
December	15	Kinetic theory of gases: 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						

		Thermodynamics : Introduction – Reversible and irreversible processes – Carnot's engine and its efficiency – Carnot's theorem – Second law of thermodynamics, Kelvin's and Claussius statements – Thermodynamic scale of temperature.	Carnot's engine and it's efficiency	01	YES	Assignment I	1	YES	
January	15	Entropy:-Entropy, physical significance – Changein entropy in reversible and irreversibleprocesses – Entropy and disorder –Entropy of universe – Temperature-Entropy (T-S) diagram. Change ofEntropy of a perfect gas – Change ofentropy when ice changes into steam.Thermodynamic potentials and	Change of Entropy of a perfect gas	07	YES	Assignment II Seminar Assignment	1 hour 1 1 Hour	YES YES YES	
		Maxwell's equations: 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.	Clausius- Clayperon's equation	08	YES	III Seminar	1 Hour	YES	
February	15	Low temperature Physics:							
		liquefaction of gas using porous plug	Adiabatic	15	YES	Assignment	1 hour	YES	

		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.	demagnetization Production of low temperatures			IV			
March	15	Quantum theory of radiation: 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.	Disappearing filament optical pyrometer – experimental determination	15	Yes	Assignment V	1 hour	YES	

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	lf not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date	
December	12	 Introduction to Energy: Definition and units of energy, power, Forms of energy, Energy flow diagram to the earth. Role of energy in economic and social development. Environmental Effects: 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	Global Energy Scenario: Energy consumption in various sectors, energy resources, coal, oil, natural gas, nuclear and hydroelectric power. Indian Energy Scene: 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	Solar energy: Solar energy, Spectral distribution of radiation, solar water heating system, Applications, Solar cooker. Solar		Solar energy,	01	YES		Assignment	01	YES		

	cell, Types of solar cells. Wind Energy: Introduction, Principle of wind energy conversion, and Components of wind turbines, Operation and characteristics of a wind turbine, Applications of wind energy.	Spectral distribution of radiation						
March 12	 Ocean Energy: Introduction, Principle of ocean thermal energy conversion, Tidal power generation, Tidal energy technologies, Energy from waves. Hydrogen Energy: History of hydrogen energy-Hydrogen production methods-Electrolysis of water, uses of hydrogen as fuel. Bio-Energy 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. 	Energy from biomass – Sources of biomass – Conversion of biomass into fuels	01	YES	Seminar Assignment	01	YES	