Bharatiya Vidya Bhavan

Bhavan's Vivekananda College

of Science, Humanities and Commerce

Accredited with 'A' grade by NAAC –Autonomous – Affiliated to Osmania University

Program: B.Sc (MPCs) Course Title (Paper title): MECHANICS (PH 123)

Name of the faculty: T. SAI SANTOSH	Department: Physics & Electronics	Year/Semester: I/I	No. of classes per week: 4

Learning objectives: *The aim of this course is designed*

1. *To explain vectors and Newton's Laws.*
2. *To distinguish between the two types of collisions and to interpret the laws of planetary motion.*
3. *To describe various types of motion associated with rigid bodies and to explain the behavior of materials.*
4. *To interpret the concept of relativity.*

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Signature of the Faculty*	*Signature of the HoD*
1	June 3rd Week	I	Introduction to Scalar and vector fields		Chalk & Board		completed	
2	June 4th Week	I	gradient of a scalar field and its physical significance. Divergence and Curl of a vector field and related problems	Importance of gradient, div and curl to understand EM fields.	Chalk & Board	Solving exercise problems	completed	
3	July 1st Week	I	Vector integration, line surface and volume integrals. Gauss, Stokes and Green's theorems – simple applications	Applications of these laws in physics	Chalk & Board		completed	
4	July 2nd Week	I	Laws of motion, Motion of system of variable mass, motion of a rocket, multi-stage rocket,	Understanding of launching satellites by these concepts	Chalk & Board	Assignment	completed	
5	July 3rd Week	I	Conservation of energy and momentum. Frames of reference - Centre of mass and laboratory frames. Coefficient of restitution		Chalk , Board &PPT	Solving exercise problems	completed 24/7/19	
6	July 4th Week	II	Collisions (elastic and inelastic) in two and three dimensions with examples. concept of impact parameter, differential scattering cross – section, Rutherford scattering.	Consequence of relation between scattering angle and impact parameter to atomic models	Chalk , Board &PPT		completed	
7	August 1st Week	II	Central forces – definition and examples, conservative nature of central forces, force as a negative gradient of potential energy, centre of mass of many body system, two body problem, equation of motion under a central force.		Chalk & Board	Assignment	Not completed I took Extra classes on Saturday 5th hrs to complete the proposed syllabus. Santoshi	

Signature of Faculty Signature of HOD

8	August 2nd Week	II	Kepler's laws-Derivation. Coriolis force and its expressions.		Chalk & Board	Solving exercise problems	Completed
9	August 3rd Week	III	Definition of Rigid body. Rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertia tensor. Euler's equations.		Chalk & Board		Not completed I took Extra classes.
10	August 4th Week	III	torque free motion of a symmetric top. Symmetric top and precessional motion, Gyroscope and navigation precession of the equinoxes.		Chalk , Board &PPT	Solving exercise problems	Completed
11	September 1st Week	IV	Frames of reference- inertial and non inertial, Galilean transformation equations, Galilean Invariance, Absolute frame of reference, Michelson – Morley experiment	Importance of relativity	Chalk & Board		Completed
12	September 2nd Week	IV	Significance of negative result. Postulates of special theory of relativity. Lorentz transformation.		Chalk & Board	Solving exercise problems	Not completed I took extra classes
13	September 3rd Week	IV	time dilation, length contraction, addition of velocities. Position and velocity as four vectors, four momentum, mass – energy relation.	Concept of invisibility	Chalk & Board	Solving exercise problems	completed
14	September 4th Week	III	Stress and strain relation, Elastic constants of isotropic solids, Uniform and non uniform strains with examples. Equivalence of shear strain to compression and extension strains. Poisson's ratio and relation between elastic constants	Applications of concepts in solving real time problems	Chalk & Board	Assignment	completed
15	October 1st Week	III	Energy stored in a strained body. Statics of solid beams and columns, Cantilever with end load–expression for Bending moment	Practical applications in construction of buildings	Chalk & Board		completed

Learning outcomes: *By the end of this course, the student will be able to*

CO1: use the concepts of vectors and apply Newton's laws in solving various problems.

CO2: explain collisions and conservative nature of central forces.

CO3: recognize various types of rigid body motion and different mechanical properties.

CO4: distinguish between the frames of reference and explain the concept of relativity.

03/10/19

Santosh

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
Vivekananda College
Saifabad, Secunderabad-500 004

Per. No.:

Bharatiya Vidya Bhavan

Bhavan's Vivekananda College

of Science, Humanities and Commerce

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Program: B.Sc (MPCs) Course Title (Paper title): MECHANICS (PH 123) – 2019-20

Name of the faculty: Dr. Choudary	Department: Physics & Electronics	Year/Semester: I/I	No. of classes per week: 4

Learning objectives: *The aim of this course is designed*

1. *To explain vectors and Newton's Laws.*
2. *To distinguish between the two types of collisions and to interpret the laws of planetary motion.*
3. *To describe various types of motion associated with rigid bodies and to explain the behavior of materials.*
4. *To interpret the concept of relativity.*

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Signature of the Faculty*	*Signature of the HoD*
1	June 3rd Week	I	Introduction to Scalar and vector fields		Chalk & Board		Completed	
2	June 4th Week	I	gradient of a scalar field and its physical significance. Divergence and Curl of a vector field and related problems	Importance of gradient, div and curl to understand EM fields.	Chalk & Board	Solving exercise problems	Completed	
3	July 1st Week	I	Vector integration, line surface and volume integrals. Gauss, Stokes and Green's theorems – simple applications	Applications of these laws in physics	Chalk & Board		Completed	
4	July 2nd Week	I	Laws of motion, Motion of system of variable mass, motion of a rocket, multi-stage rocket,	Understanding of launching satellites by these concepts	Chalk & Board	Assignment	Completed	
5	July 3rd Week	I	Conservation of energy and momentum. Frames of reference - Centre of mass and laboratory frames. Coefficient of restitution		Chalk , Board &PPT	Solving exercise problems	Completed	
6	July 4th Week	II	Collisions (elastic and inelastic) in two and three dimensions with examples. concept of impact parameter, differential scattering cross – section, Rutherford scattering.	Consequence of relation between scattering angle and impact parameter to atomic models	Chalk , Board &PPT		Complete	
7	August 1st Week	II	Central forces – definition and examples, conservative nature of central forces, force as a negative gradient of potential energy, centre of mass of many body system, two body problem, equation of motion under a central force.		Chalk & Board	Assignment	Completed	

8	August 2nd Week	II	Kepler's laws-Derivation, Coriolis force and its expressions.		Chalk & Board	Solving exercise problems	Completed	
9	August 3rd Week	III	Definition of Rigid body. Rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertia tensor. Euler's equations.		Chalk & Board		Completed	
10	August 4th Week	III	torque free motion of a symmetric top. Symmetric top and precessional motion. Gyroscope and navigation precession of the equinoxes.		Chalk . Board &PPT	Solving exercise problems	Completed	
11	September 1st Week	IV	Frames of reference- inertial and non inertial, Galilean transformation equations, Galilean Invariance, Absolute frame of reference, Michelson – Morley experiment	Importance of relativity	Chalk & Board		Completed	
12	September 2nd Week	IV	Significance of negative result. Postulates of special theory of relativity. Lorentz transformation.		Chalk & Board	Solving exercise problems	Completed	
13	September 3rd Week	IV	time dilation, length contraction, addition of velocities. Position and velocity as four vectors, four momentum, mass – energy relation.	Concept of invisibility	Chalk & Board	Solving exercise problems	Completed	
14	September 4th Week	III	Stress and strain relation, Elastic constants of isotropic solids, Uniform and non uniform strains with examples. Equivalence of shear strain to compression and extension strains. Poisson's ratio and relation between elastic constants	Applications of concepts in solving real time problems	Chalk & Board	Assignment	Completed	
15	October 1st Week	III	Energy stored in a strained body. Statics of solid beams and columns, Cantilever with end load–expression for Bending moment	Practical applications in construction of buildings	Chalk & Board			

Learning outcomes: *By the end of this course, the student will be able to*

CO1: use the concepts of vectors and apply Newton's laws in solving various problems.

CO2: explain collisions and conservative nature of central forces.

CO3: recognize various types of rigid body motion and different mechanical properties.

CO4: distinguish between the frames of reference and explain the concept of relativity.

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Dept. of Physics & Electronics
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Bhavan

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Ac. yr 2019-20

Program: B. Sc. M.P.Cs II yr

Course Title : Thermodynamics

Semester: III

Paper Code: PH 323

Name of the faculty: V.R.Manjula	**Department:** Physics	**Year/Semester:** II yr III sem	**No. of classes per week:** 4

Learning objectives: This course is a prerequisite to any advanced theoretical studies. The student is introduced to the fundamental aspects of Quantum Mechanics and Nuclear Physics through this course

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	Review	Hod's Review
1	June week: III	I	Thermodynamic terms and definitions. Laws of thermodynamics-introduction	Third Law of thermodunamics Nernst theorem	Chalk & board.	List out all the microscopic and macroscopic variables along with Intensive and Extensive variables.	Completed	
2	June week: IV	I	First Law of thermodynamics. Kelvin and Claussius statements	Adiabatic demagnetization: Effective method of increasing efficiency	Chalk & board, PPT	Derive the adiabatic relations for perfect gas	Completed	

Ac.yr 2019-20

S.No.	Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Hod's Review
3	July week: I	I	Concept of entropy. Second Law applications	Heat death of Universe	Chalk & board	Solving problems based on I and II law of thermodynamics	Completed fz	
4	July week: II	II	Thermodynamic potentials and Maxwell's equations	Claussius inequality	Chalk & board	Use Mnemonics to obtain expressions for thermodynamic potentials	Thermodynamic potentials mnemonics Completed. Maxwells Equations to be done next week fz	
5	July week: III	II	Applications of Maxwell:s Equations. Low temperature Physics		Chalk & board	Use Mnemonics to obtain Maxwell's relations	Completed. More applications to be done next week fz	
6	July week: IV	II	Methods of Production of low temperatures. Refrigeration	Liquification of He-Onne's method; He I and He II	PPT		Maxwells Equations Applications Conformed, Refrigeration to be done later fz	
7	August week I			Bhavanothsav				
8	August week II	III	Kinetic theory of gases. Law of Equipartition energy-Application to Specific heat of gases. Equation of states.	Brownian motion	Chalk & board		Completed Cp, Cv for energy equations later fz	
9	August week III	III	Maxwell's distribution law of speeds Experimental verification. Transport Phenomena	specific heat of polyatomic gas; Largest thermal conductivity of Hydrogen			Transport phenomena to be done later fz	
10	August week IV	IV		CIA I				

PLAN AND REVIEW SHEET FOR CURRICULAR PROGRAMMES FOR THE ACADEMIC YEAR- 20 - 20

Ac. yr. 2-0-19-20

S.No.	Month & Week	Units	Syllabus	Additional Input value addition	Teaching method	Student learning activity	Review	Hod's Review
10	August week V	III	Statistical mechanics - introduction. Classical Statistics		Chalk & board	Solving probabbility based problems	Not Completed To be done later JZ	
11	September week I	III	Quantum Statistics		Chalk & board	Calculating Thermodynamic and Priory probability for simple systems	Classical Statistics Completed JZ	Promised
12	September week II	IV	Radiation Laws	Boltzmann's modification of Stephan's law	PPT		Completed JZ	Promised
13	September week III	IV	Quantum theory of radiation		Chalk & board	Calculation of number of degrees of freedom in three dimensions	Completed Transport phenom & Pyrometers, Equate Statistics to be done for	Promised
14	September week IV	IV	Pyrometers	Green House effect	Chalk & board		Completed	
15	October week I	IV	Revision					

Learning Outcomes: Having Completed the Course, the students would be able to Understand the process of Conversion of Work to Energy & Vice Versa, by a System guided by laws of thermodynamics

Bharatiya Vidya Bhavan

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Program: B.Sc (MPCs) Course Title (Paper title): THERMODYNAMICS (PH 323)

Name of the faculty: T Sai Santoshi	Department: Physics & Electronics	Year/Semester: II/III	No. of classes per week: 4

Learning objectives:

This course focuses largely on how a heat transfer is related to various energy changes within a physical system undergoing a thermodynamic process.

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Signature of the Faculty*	*Signature of the HoD*
1	June 3rd Week	I	Zeroth law of Thermodynamics and concept of thermal equilibrium. Extensive and intensive Thermodynamic Variables. Internal energy as state function and indicator diagram.First Law of thermodynamics: Applications and limitations. Isothermal and Adiabatic processes and relation between the specific heats.		Chalk & Board	Derive the adiabatic relations for perfect gas.	completed	
2	June 4th Week	I	Reversible and Irreversible processes. Carnot's Engine and its efficiency. **1. Second law of thermodynamics and**		Chalk & Board	Solving problems based on efficiency.	completed	

			Entropy: (8) Kelvin's and Claussius statements, Thermodynamic scale of temperature and its equivalence to ideal Gas Scale. Entropy: physical significance. Change in entropy in reversible and irreversible processes,				Completed	
3	July 1st Week	I	Entropy and disorder, Entropy of Universe, Temperature-Entropy (T-S) diagram. Change of entropy of a perfect gas and change of entropy when ice changes into steam.		Chalk & Board	Solving problems based on 1st and 2nd Law of Thermo dynamics.	completed	
4	July 2nd Week	II	Maxwell's Relations: (1) Clausius Clapeyron equation, (2) Value of Cp -C_v, (3) TdS Equations. Joule Kelvin effect: Expression for Joule Kelvin coefficient for perfect and Vanderwall's gas.		Chalk & Board	Assignment	completed	
5	July 3rd Week	II	Methods of Production of low temperatures. Joule Thomson's porous plug Experiment.Distinction between Joule's, Adiabatic and Joule Thomson's Expansion processes		Chalk & Board		completed	
6	July 4th Week	II	Liquefaction of gases: liquefaction of hydrogen and Helium – Adiabatic Demagnetization.		Chalk Board& PPT		completed	
7	August 1st Week	II	Principle of Refrigeration. Vapor Compression Machine.		Chalk & Board		Completed	

8	August 2nd Week	III	Elements of Kinetic theory of gases: Mean free path and degrees of freedom. Law of Equipartition of energy and its application to specific heat of mono and diatomic gases		Chalk & Board		Not completed I took extra classes to complete the proposed syllabus.
9	August 3rd Week	III	Equation of State: Ideal and Vander wall's gases. Distribution of velocities: Derivation of Maxwell's law of distribution of speeds in ideal gas and its experimental verification. Speed distribution curves		Chalk & Board		completed
10	August 4th Week	III	Transport phenomena: Viscosity, Thermal conduction and diffusion	Largest thermal conductivity of Hydrogen	Chalk & Board		completed
11	September 1st Week	IV	Black body: Ferry's black body, distribution of energy in the spectrum of Black body.Stephan's law, Wien's displacement law (qualitative), Wien's lawand Rayleigh-Jean's law. Quantum theory of Radiation: Planck's law,		Chalk & Board		Not completed I took extra classes to completethe proposed syllabus
12	September 2nd Week	IV	Wien's law, Rayleigh-Jeans law and Stephan's law from Planck's law. Determination of Stephan's constant. Deduction of Newton's law of cooling from Stephan's law.		Chalk & Board	Assignment	completed
13	September 3rd Week	IV	Pyrometers: Types of pyrometers. Disappearing filament optical pyrometer. Angstrom Pyroheliometer and	Green house effect	Chalk & Board		completed

			determination of solar constant. Estimation of temperature of sun				completed	
14	September 4th Week	III	Introduction to Statistical Mechanics: Concept of ensembles and phase space. Density of Distribution and Statistical equilibrium. Concept of probability: Distribution function and probability theorems. Maxwell Boltzmann's distribution law		Chalk & Board		completed	
15	October 1st Week	III	Quantum statistics: Bose Einstein's Distribution law and Fermi Dirac distribution law. Comparison of three statistics		Chalk & Board		completed 01/10/19.	
		Learning outcomes: Having completed this course, student should understand and acquire knowledge of work being done by the system guided by Laws of Thermodynamics.						

Santoshi

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
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Kalkpuri, Secunderabad-500 094

No.:

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Program: B.Sc (MPCs) Course Title (Paper title): ELECTRICITY & MAGNETISM (PH 523) (2019-20)

Name of the faculty: Asiya Sultana Ahmed	Department: Physics & Electronics	Year/Semester: III/V	No. of classes per week: 3
Learning objectives: *The objective of this course is to establish a comprehensive understanding of electromagnetism in preparation for more advanced courses.*			

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Signature of the Faculty*	*Signature of the HoD*
1	June 3rd Week	I	**Electrostatics:** Electric field intensity and Electric potential Definition and relation between them. Gauss law and its applications- Deduction of Coulomb's law from Gauss law.		Chalk & Board		Completed on	
2	June 4th Week	I	Force on charged conductor. Expression for electric field intensity and electric potential for electric dipole, an infinite line of charge, an infinite conducting sheet of charge.		Chalk & Board	Solving exercise problems	Completed on	
3	July 1st Week	I	Expression for electric field intensity and electric potential for uniformly charged hollow/solid Sphere and charged cylindrical conductor.		Chalk & Board	Assignments	Completed on	
4	July 2nd Week	II	**Dielectrics:** Atomic view of dielectrics. Torque and potential energy due to a dipole in an electric field. Polarization and charge density Gauss's law for dielectric medium		Chalk & Board		Completed on	

			Displacement current Relation between D.E. and P					
5	July 3rd Week	II	Dielectric constant. permittivity. susceptibility and relation between them. Boundary conditions for D and E at the dielectric surface. **Capacitance**: Capacitance of spherical and cylindrical capacitors. Capacitance of parallel plate condenser with and without dielectric.		Chalk & Board	Solving exercise problems	Completed on	
6	July 4th Week	II	Electric energy stored in a charged condenser - force between plates of condenser. construction and working of attracted disc electrometer and its use for the measurement of dielectric constant.		Chalk & Board		Completed on	
7	August 1st Week	III	**Magnetostatics:** Biot-Savart's law and Ampere's Law. Determination of B due to a long straight wire. a circular current loop and solenoid.		Chalk & Board		Completed on	
8	August 2nd Week	III	Magnetic shell. Potential due to magnetic shell and field due to magnetic shell. Equivalence of electric circuit and magnetic shell. Magnetic induction (B). magnetic field Intensity (H) and Intensity of magnetization. Permeability. Susceptibility.		Chalk & Board	Solving exercise problems	Completed on	
9	August 3rd Week	III	Hysteresis loop. **Moving charge in electric and magnetic field:** Motion of charged particles in electric and magnetic fields. Hall effect.		Chalk & Board		Completed on	
10	August 4th Week	III	Cyclotron. synchro-cyclotron and synchrotron. Force on a current carrying conductor placed in a magnetic field. force and torque on a current loop.		Chalk & Board	Student presentations	Completed on	
11	September 1st Week	IV	Faraday's law -Lenz's law expression for induced emf time varying magnetic fields -Betatron-Ballistic galvanometer-theory - damping correction		Chalk & Board		Completed on	

12	September 2nd Week	IV	Self and mutual inductance. coefficient of coupling, calculation of self-inductance of a long solenoid-toroid-energy stored in magnetic field.		Chalk & Board	Solving exercise problems	Completed @	Extra classes taken to complete the proposed syllabus
13	September 3rd Week	IV	**Maxwell's equations and electromagnetic waves:** A review of basic laws of electricity and magnetism displacement current Maxwell's equations: Integral and differential form, Maxwell's wave equation.		Chalk & Board		Completed @	
14	September 4th Week	IV	**Electromagnetic waves:** Transverse nature of electromagnetic waves. velocity of electromagnetic waves energy of electromagnetic waves Poynting theorem, production of electromagnetic waves (Hertz experiment)		Chalk & Board	Student Presentations	Completed @	Extra classes taken to complete the proposed syllabus.
15	October 1st Week	Revision			Chalk & Board			

Learning outcomes: Having completed this course, students should be capable of applying principles of electromagnetism to various fields of physics.

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Academic year 2019-20
class MPCs III 'A'

Program: B. Sc. M.P.Cs III yr

Course Title : Solid state Physics & ~~Spectroscopy~~

Semester: V

Paper Code: PH 523 A

Name of the faculty: V.RManjula	**Department:** Physics	**Year/Semester:** III yr VI sem	**No. of classes per week:** 3

Learning objectives: This course is a prerequisite to any advanced theoretical studies. The student is introduced to the fundamental aspects of Quantum Mechanics and Nuclear Physics through this course

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	Review	Hod's Review
1	June week: III	I	Crystal Structure and Miller Indices		Chalk & board, Charts		Crystal Structure Completed. Miller Indices to be done next week VR	
2	June week: IV	I	Diffraction of X –rays in crystals.Experimental techniques	Experimental Demonstration	Chalk & board, PPT	Obtaining miller indices for various surfaces of a cubic lattice	Completed VR	
3	July week: I	I	Bonding in Crystal. Determination of lattice energy and Born's repulsive exponent		Chalk & board, PPT	Preparing presentation slides for crystal structure and diffraction	Completed VR	

Class : MPCs III B Acad 2019-20

No.	Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Hod's Review
4	July week: II	I	Classification of Magnetic materials Langevin's theory and weiss's theory	Superparamagnetism	Chalk & board, PPT	Solving problems based on critical field and temperatures	Classification Completed Langevin's theory done	
5	July week: III	II	SuperconductivityBCS theory, High Tc superconductors. Applications	Squids	Chalk & board		High Tc Superconductivity to be done later	
6	July week: IV	II	Nano materials: Introduction Synthesis & nanofabrication:		Chalk & board	Presentations by students	Completed	
7	August week I	I		Bhavanothsav			Atomic Spectra & Vector Atom Model done	
8	August week II	II	Chemical methods Characterization techniques. Properties and Applications	Nano Agri products	Chalk & board	Seminars/Presentations	Stern Gerlach Experiment & screening effect done only One Presentation given	
9	August week III	III	Atomic spectra		Chalk & board		Completed	
10	August week IV	III		CIA				

Dept. of Physics & Electronics
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Saidabad, Secunderabad-500 059

PLAN AND REVIEW SHEET FOR CURRICULAR PROGRAMMES FOR THE ACADEMIC YEAR-2019- 2020

Class : M.P.Ce III B Subject : Solid State Physics & Spectroscopy

Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Hod's Review
August week V	III	Vector atom model. LS and JJ coupling schemes Spectral terms and notations		Chalk & board	Solving problems based on spectral terms	Larmor's Precession Zeeman effect Completed	Provided
September Week I	IV	One electron spectra Zeeman & Stark Effect	Rydberg's constant determination	PPT		Completed	Provided
September Week II	IV	Molecular Spectra. Spectrum of diatomic molecule		Chalk & board	students seminar	Completed	Provided
September Week III	IV	Vibrational and Electronic spectra		Chalk & board	students seminar	Completed	Provided
September Week IV	IV	Raman Spectra				Completed	
March week I	IV	Revision					

Learning Outcomes: On completion of course, the students would be able to

* Identify the type of bonding based on crystal structure
* classify magnetic materials based on the behavior of materials in the field
* Gain the knowledge of Process of Synthesis & characterization of Nanomaterials
* gain insight of Atomic & Molecular Spectra.
* Obtain the Spectral terms & possible excited states of an e⁻ in a particular orbit.

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Program: B.Sc (MPCs) Course Title (Paper title): Solid State physics and spectroscopy (PH 523A) 2019-20

Name of the faculty: Dr G S V R K Choudary	**Department: Physics & Electronics**	**Year/Semester: V/5** III yr	**No. of classes per week: 3**

Learning objectives:

This course introduces to the students the basic crystal structure and diffraction studies on solids with an emphasis on Bonding. Spectroscopic studies of Alkali materials, Inclusion of Study of Magnetic properties of solids, Superconductivity and Nano materials, makes it a prerequisite course for any Advanced study or Research in the fields of Condensed matter Physics or Materials in General.

S.No	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student learning activity*	*Review/ Signature of the Faculty*	*Signature of the HoD*
1	June 2nd Week	I	**Crystal Physics and diffraction** Amorphous and Crystalline nature of matter		Chalk-Board &PPT			
2	June 3rd Week	I	Crystal systems, Bravais lattices. Miller indices. Simple crystal structures		Chalk-Board &PPT			
3	June 4th Week	I	Types of bonding in crystals, Lattice energy, Medelung's Constant, Born Haber cycle Diamond and Zns structures		Chalk-Board &PPT	Solving exercise problems		
4	July 1st Week	I	Diffraction of X–rays by crystals-Bragg's law, Laue's and powder diffraction method	Importance of X ray diffraction in identifying material and crystal structure	Chalk-Board &PPT	Solving exercise problems		
5	July 2nd Week	I	Magnetic properties of materials-Langevin's theory,Weiss theory, Molecular field and exchange interactions.		Chalk- & Board			
6	July 3rd Week	I	Antiferromagnetism.Magnetic domains, Ferrites -applications. **Superconductivity** Meissner effect. Type-I and Type-II superconductors. BCS theory:		Chalk- & Board			

7	July 4th Week	II	High T_c superconductors. Applications Emergence of Nanoscience, Role of particle size; Surface to Volume ratio.	Application of supperconductors	Chalk- & Board	Solving exercise problems	Completed	
8	August 1st Week	II	Synthesis and nanofabrication. Bottom-Up and Top-Down. Characterization techniques Electrical, Optical	Applications of Nanomaterials.	Chalk-Board &PPT		Completed	
9	August 2nd Week	II	**Atomic Spectra** Atoms in Electric, Magnetic fields: angular momentum, space quantization. Stern Gerlach experiment.		Chalk-Board &PPT		Completed	
10	August 3rd Week	III	Vector atom model, quantum numbers associated with LS-JJ coupling schemes.		Chalk-Board &PPT		Completed	
11	August 4th Week	III	Larmor's theorem - spin magnetic moment. Spectral terms and notations		Chalk-Board &PPT		Completed	
12	September 1st Week	IV	Alkali Spectra, doublet fine structure. Zeeman Effect, Paschen-Back Effect and Stark Effect.		Chalk-Board &PPT	Solving exercise problems	Completed	
13	September 2nd Week	IV	Types of molecular spectra, pure rotational energies and spectrum determination of inter nuclear distance.		Chalk-Board &PPT		Completed	
14	September 3rd Week	IV	Vibrational energies - spectrum of diatomic molecule. fluorescence phosphorescence.		Chalk-Board &PPT		Completed	
15	September 4th Week	III	Raman Effect: Classical and quantum theory of Raman Effect. Raman's Spectrometer. Applications of Raman Effect	Practical importance to characterize material using raman effect	Chalk-Board &PPT	Solving exercise problems	Completed	

Learning outcomes: *Having completed the course the student will be able to*

- *Understand the probable interactions between matter and electromagnetic radiation*
- *Acquires the basic knowledge of dependence of various properties of materials, based on its structural arrangement*
- *Understand the fundamentals of emission and absorption spectra and analyze visible and basic alkali spectra*
- *Familiarize with Nanomaterials*

Signature of the Faculty

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Sharatiya Vidya Bhavan's
Vivekananda College
Kachkpuri, Secunderabad-500 009

Signature of the HOD

Bharatiya Vidya Bhavan

Bhavan's Vivekananda College of Science, Humanities and Commerce

An autonomous college affiliated to Osmania University

Program – B Sc MECs I Year

Course: Electronics - Circuit Analysis EL124

2019 - 20

Name of the faculty: T. Prasad	Department: ELECTRONICS	Year/Semester: I year / I	No. of classes per week: 4 / credits 4

Learning objectives:

To develop an understanding of the basic circuit elements and laws of electric circuits

To introduce the basic concepts of DC and AC circuit behavior

To make the students proficient in analyzing any given electrical network by applying basic circuit laws and network theorems

To become familiar with the working principle of CRO and its operation

S.No.	*Month & Week*	*Unit*	*Syllabus*	*Additional Input / value addition*	*Teaching method*	*Student/learning activity*		
1	June 3rd Week	1	Periodic waveform, peak, average & RMS values, form factor	Generation of ac signal - videos	Power point presentations	Observation of various AC signals, and measure amplitude and time period		
2	June 4th Week	1	phase, operator 'j', phasor diagram, Impedance and admittance polar and rectangular forms of complex numbers		Board and chalk	Solve problems in conversions - from rectangular to polar and vice versa		
3	July 1st Week	1	Concept of voltage and current sources KVL and KCL	Pspice demonstration	Board and chalk			
4	2nd Week	2	solution of networks using Mesh analysis.		Board and chalk	Numerical examples		
5	3rd Week	2	solution of networks using Nodal analysis.		Board and chalk			
6	4th Week	2	Superposition Theorem, Thevenin's Theorem		Board and chalk			
7	August 1st Week	3	Norton's Theorem, Maximum power transfer Theorem		Board and chalk	Assignment		
8	2nd Week	3	Millman's Theorem,		Board and chalk			

9	3rd Week	3	Reciprocity Theorem, T and π networks		Board and chalk	Assignment/ Seminar		
10	4th Week	3	Transient response of RC and RL circuit, Time constants	Demo of RC transient response	Board and chalk	Student seminars		
11	September 1st Week	4	Filters - Low pass filter, high pass filter,		Board and chalk			
12	2nd Week	4	Differentiating and Integrating circuits, Series resonance	Pspice demonstration	Board and chalk			
13	3rd Week	4	Series and Parallel Resonance in RLC circuits, Q factor – band width – Selectivity.	you tube videos	Power point presentations	Numerical examples		
14	4th Week	4	Cathode Ray Oscilloscope	Demo of components in a CRO	Power point presentations, Board and chalk	Assignment/ Seminar		
15	October 1st Week		Revision					

Learning outcomes:

Apply the knowledge of basic circuit laws and simplify the network using reduction techniques
Analyze the circuits using Kirchhoff's laws and network theorems
Evaluate transient response and steady state response of RC and RL circuits
Analyze the frequency response of circuits containing RC, RL and RLC
Understand the working of the most commonly used equipment CRO and use it for measurement of electrical quantities
Simulate, to study the transient and frequency response of RC, RL and RLC circuits using appropriate software

Signature of the Faculty

(T Prasad)

Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
Vivekananda College
Saifabad, Secunderabad-500 004

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Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
An autonomous college affiliated to Osmania University
Program – B Sc MECs I Year
Course: Electronics - Circuit Analysis EL124
2019 - 20

Name of the faculty: M. Prasanna	Department: ELECTRONICS	Year/Semester: I year / I	No. of classes per week: 4 / credits 4

Learning objectives:

To develop an understanding of the basic circuit elements and laws of electric circuits

To introduce the basic concepts of DC and AC circuit behavior

To make the students proficient in analyzing any given electrical network by applying basic circuit laws and network theorems

To become familiar with the working principle of CRO and its operation

S.No.	*Month & Week*	*Unit*	*Syllabus*	*Additional Input / value addition*	*Teaching method*	*Student/learning activity*		
1	June 3rd Week	1	Periodic waveform, peak, average & RMS values, form factor	Generation of ac signal	Ppt	Observation of various AC signals, and measure amplitude and time period		
2	June 4th Week	1	phase, operator 'j', phasor diagram, Impedance and admittance polar and rectangular forms of complex numbers		Board and chalk	Solve problems in conversions - from rectangular to polar and vice versa		
3	July 1st Week	1	Concept of voltage and current sources KVL and KCL	Pspice demonstration	Board and chalk			
4	2nd Week	2	solution of networks using Mesh analysis.		Board and chalk			
5	3rd Week	2	solution of networks using Nodal analysis.		Board and chalk			
6	4th Week	2	Superposition Theorem, Thevenin's Theorem		Board and chalk			
7	August 1st Week	3	Norton's Theorem, Maximum power transfer Theorem		Board and chalk			
8	2nd Week	3	Millman's Theorem,		Board and chalk			

9	3rd Week	3	Reciprocity Theorem, T and π networks		Board and chalk	Assignment / seminar		
10	4th Week	3	Transient response of RC and RL circuit, Time constants	Demo of RC transient response	Board and chalk	Student seminars		
11	September 1st Week	4	Filters - Low pass filter, high pass filter,		Board and chalk			
12	2nd Week	4	Differentiating and Integrating circuits, Series resonance	Pspice demonstration	Board and chalk			
13	3rd Week	4	Series and Parallel Resonance in RLC circuits, Q factor – band width – Selectivity.	Youtube videos	Power point presentations	Numerical examples		
14	4th Week	4	Cathode Ray Oscilloscope	Demo of components in a CRO	Power point presentations Board and chalk	Assignment / seminar		
15	October 1st Week		Revision					

Learning outcomes:

Apply the knowledge of basic circuit laws and simplify the network using reduction techniques
Analyze the circuits using Kirchhoff's laws and network theorems
Evaluate transient response and steady state response of RC and RL circuits
Analyze the frequency response of circuits containing RC, RL and RLC
Understand the working of the most commonly used equipment CRO and use it for measurement of electrical quantities
Simulate, to study the transient and frequency response of RC, RL and RLC circuits using appropriate software

Signature of the Faculty

Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
Vivekananda College
Saifabad, Secunderabad-500 063

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Per. No.:

Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
Autonomous – Affiliated to Osmania University

Program: BSc MECs Course Title (paper title): Analog Circuits

Name of the faculty: P. Lavanya	Department: Physics&Electronics	Year/Semester: Sem III 2019	No. of classes per week: 4
Learning objectives: To analyze various circuits like rectifiers, filters and regulators to design a complete regulated power supply and to learn concept of positive and negative feed backs to understand the design of amplifiers, oscillators and multivibrators.			

Month & Week (no. of classes)	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Review*	*sign*	*Hod sign*
June 2nd week	I	Introduction - diodes Rectifiers.		Chalk&Board				
June 3rd Week	I	Half wave, full wave, bridge rectifiers – ripple factor, efficiency and Voltage regulation.		Chalk&Board	Construction of Half wave and full wave rectifiers and calculation of ripple factor during lab session	completed	Lavanya	18/7
June 4thWeek	I	Harmonic components Filters – Inductor, capacitor		Chalk&Board				
July 1stWeek	I	L and π section filters and Zener regulation		Chalk&Board	Construction of filters and calculation of ripple factor during lab session.	Completed	Lavanya	
July 2ndWeek	I	Regulated power supplies – series and shunt		Chalk&Board				
July 3rd Week	II	IC regulators - 78xx and 79xx.		Chalk&Board				
July 4th Week	II	SMPS and UPS		Chalk&Board	Construction Of Regulators using Ic's			
August 1stWeek	II	Transistor basics		Chalk&Board		completed		

Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	sign	Hod sign
August 2nd Week	III	Hybrid π model of a transistor and Classification of amplifiers.		Chalk&Board				
August 4th Week	III	RC Coupled Amplifier.		Chalk&Board	Construction of RC coupled Amplifier and study of frequency response during lab session	completed	Lowcee	
September 1st Week	III	Feedback in amplifiers and effect of negative feedback.		Chalk&Board	Simulation of rectifiers and filters using pspice.			
September 2nd Week	III	Emitter follower, Darlington pair and Oscillators – Barkhausen criteria.	Individual Seminar presentation on functionality and applications of any analog circuit.	Chalk&Board	Study of frequency response of RC coupled amplifier using pspice.	completed	Lowcee	
September 3rd Week	IV	RC, LC and crystal oscillators.		Chalk&Board	Simulation of RC and LC oscillators using pspice.			
September 4th Week	IV	Multivibrators –astable, monostable and bistable.		Chalk&Board				
October 1st Week	IV	Schmitt trigger.		Chalk&Board		completed	Lowcee	

Learning outcomes: On completion of course students will be able to design a regulated power supply and differentiate several amplifiers filters and multivibrators.

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
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Sainikpuri, Secunderabad-500 094

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Bhavan's Vivekananda College
of Science, Humanities and Commerce
Autonomous – Affiliated to Osmania University

Program: BSc MECs **Course Title (paper title): Analog Circuits**

Name of the faculty: B Niraimathi	Department: Physics&Electronics	Year/Semester: 2019-20/Sem III	No. of classes per week: 4
Learning objectives: To analyze various circuits like rectifiers, filters and regulators to design a complete regulated power supply and to learn concept of positive and negative feed backs to understand the design of amplifiers, oscillators and multivibrators.			

S.No.	*Month & Week (no. of classes)*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Review*	*sign*	*Hod sign*
1	June 2nd week 2	I	Introduction - diodes Rectifiers.		Chalk&Board		Completed upto HWR	Bsrinivas	
2	June 3rd Week 1	I	Half wave, full wave, bridge rectifiers – ripple factor, efficiency and Voltage regulation.		Chalk&Board	Construction of Half wave and full wave rectifiers and calculation of ripple factor during lab session	Completed upto FWR	Bsrinivas	
3	June 4thWeek 3	I	Harmonic components Filters – Inductor, capacitor		Chalk&Board		Covered BR & Completed upto Inductor	Bsrinivas	
4	July 1stWeek 4	I	L and π section filters and Zener regulation		Chalk&Board	Construction of filters and calculation of ripple factor during lab session.	Covered C-filter & others.	Bsrinivas	
5	July 2ndWeek 3	I	Regulated power supplies – series and shunt		Chalk&Board		completed	Bsrinivas	
6	July 3rd Week 2	II	IC regulators - 78xx and 79xx.		Chalk&Board		Completed	Bsrinivas	
7	July 4th Week 5	II	SMPS and UPS		Chalk&Board	Construction Of Regulators using Ic's	Covered Amplifier classification	Bsrinivas	
8	August 1stWeek	II	Transistor basics		Chalk&Board		Covered SMPS & UPS	Bsrinivas	

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No.	Month & Week	Units	Syllabus	Input/ value addition	Teaching method	Student/learning activity	Review	sign	sign
	August 2nd Week 1	III	Hybrid π model of a transistor and Classification of amplifiers.		Chalk&Board		✓ Completed	Boorniek	
0	August 4th Week 4	III	RC Coupled Amplifier.		Chalk&Board	Construction of RC coupled Amplifier and study of frequency response during lab session	✓ Completed	Boorniek	
1	September 1st Week 3	III	Feedback in amplifiers and effect of negative feedback.		Chalk&Board	Simulation of rectifiers and filters using pspice.	✓ Completed	Boorniek	
2	September 2nd Week 3	III	Emitter follower, Darlington pair and Oscillators – Barkhausen criteria.	Individual Seminar presentation on functionality and applications of any analog circuit.	Chalk&Board	Study of frequency response of RC coupled amplifier using pspice.	Covered upto LC oscillators	Boorniek	
3	September 3rd Week 4	IV	RC, LC and crystal oscillators.		Chalk&Board	Simulation of RC and LC oscillators using pspice.	Covered RC & Crystal (Still not Covered)	Boorniek	
4	September 4th Week 3	IV	Multivibrators –astable, monostable and bistable.		Chalk&Board		Covered Bistable	Boorniek	
5	October 1st Week 3	IV	Schmitt trigger.		Chalk&Board	.	Covered Astable & Bistable & Schmitt Trigger	Boorniek	

Learning outcomes: On completion of course, students will be able to design a regulated power supply and differentiate several amplifiers oscillators and multivibrators.

Boorniek
Signature of the Faculty

Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
Vivekananda College
Malkpuri, Secunderabad-500 094

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7

Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
Autonomous – Affiliated to Osmania University
Program: BSc MECs Course Title (paper title): Digital Electronics

Name of the faculty: P.LaVanya	Department: Physics&Electronics	Year/Semester: Sem V 2019	No. of classes per week: 3
Learning objectives: To learn various combinational and sequential logic circuits along with data converters.			

Month & Week (no. of classes)	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Sign	Hod sign
[illegible] 1st week	I	Logic gates ,Boolean Algebra		Chalk&Board		completed		
[illegible] 3rd Week	I	De-Morgan's theorem Sum of products (SOP) and Product of sums(POS).		Chalk&Board				
[illegible] 4th Week	I	Universal gates, Simplification Of Boolean Expressions.		Chalk&Board	Introduction to digital ICs 74LS series(TTL logic family) -verification of truth tables of logic gates during lab session.			
[illegible] 1st Week	I	Karnaugh maps minimization ,NAND and NOR multi level implementation.		Chalk&Board	Realizing NAND and NOR as universal gates during lab session.	completed		
[illegible] 1st Week	I	Adders and Subtractor circuits		Chalk&Board	Construction of Adders and subtractor circuits and verifying their truth tables during lab session.			
[illegible] 3rd Week	II	Multiplexer, Demultiplexer Decoder &Encoder.		Chalk&Board	Introduction to Micro wind/DSCH-A designing tool for circuit simulation. Construction and truth table verification of various combinational circuits.			

Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Sign	Hod sign
[illegible] 4th Week	II	Parity checker & Parity generators.		Chalk&Board	Construction of decoder and encoder using Micro wind/DSCH during lab session.	Completed		
August 1st Week	II	Concept of latch and RS-flip-flop.		Chalk&Board				
August 2nd Week	III	JK and Master slave flip-flops.		Chalk&Board	Verification of truth tables of flip-flops using ICs during lab session.	completed		
August 4th Week	III	T and D flip-flops classification of registers.		Chalk&Board				
September 1st Week	III	Universal shift registers.		Chalk&Board				
September 2nd Week	III	Counters-Ring counter, Asynchronous and Synchronous counters.		Chalk&Board	Verification of truth tables of counters using ICs during lab session.			
September 3rd Week	IV	Logic families –TTL and CMOS – characteristics.		Chalk&Board	Construction and verification of truth tables of counters using flip-flops during lab session.	completed		
September 4th Week	IV	D/A and A/D converters.		Chalk&Board				

[redacted] Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Sign	Hod sign
[redacted] Number of Week	IV	Memory-classification, RAM and ROM.		Chalk&Board	completed			
[redacted] **On completion of course students will be able to design digital logic circuits and understand the details of computer hardware.**								

[redacted] of the Faculty

Signature of the HOD

Bharatiya Vidya Bhavan

Bhavan's Vivekananda College

of Science, Humanities and Commerce, Sainikpuri
Accredited with A Grade by NAAC
Autonomous – Affiliated to Osmania University

Program: B Sc MECs **Course Title (paper title): Digital Electronics**

Name of the faculty: B. Niraimathi	**Department:** Physics & Electronics	**Year/Semester:** 2019-20/ Sem V	**No. of classes per week: 3**
Learning objectives: To learn various combinational and sequential logic circuits along with data converters.			

S.No	*Month & Week (no. of classes)*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*
1	June 2nd week	I	Logic gates, Boolean Algebra	Practice problems involving Boolean algebra & K-maps for solving Boolean exp. Design of digital ckts with minimal no. of gates using SOP & POS.	Chalk & Board	
2	June 3rd Week 2	I	De-Morgan's theorem Sum of products (SOP) and Product of Sums (POS).		Chalk & Board	
3	June 4thWeek 3	I	Universal gates, Simplification Of Boolean Expressions.		Chalk & Board	Introduction to digital ICs 74LS series (TTL logic family) -verification of truth tables of logic gates during lab session.
4	July 1stWeek 3	I	Karnaugh maps minimization ,NAND and NOR multi level implementation.		Chalk & Board	Realizing NAND and NOR as universal gates during lab session.
5	July 2ndWeek 3	I	Adders and Subtractor circuits		Chalk & Board	Construction of Adders and subtractor circuits and verifying their truth tables during lab session.
6	July 3rd Week 2	II	Multiplexer, Demultiplexer Decoder &Encoder.		Chalk & Board	Introduction to Micro wind/DSCH-A designing tool for circuit simulation. Construction and truth table verification of various combinational circuits.

S.No	*Month & Week (no. of classes)*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*
1	July 4th Week 3	II	Parity checker & Parity generators.	Design of multiple bit Parity Checker Generator	Chalk & Board	Construction of decoder and encoder using Micro wind/DSCH during lab session.
2	August 1st Week 2	II	Concept of latch and RS-flip-flop.		Chalk & Board	
3	August 2nd Week 3	III	JK and Master slave flip-flops.		Chalk & Board	Verification of truth tables of flip-flops using ICs during lab session.
4	August 4th Week 2	III	T and D flip-flops classification of registers.		Chalk & Board	
5	September 1st Week 1	III	Universal shift registers.		Chalk & Board	
6	September 2nd Week 2	III	Counters-Ring counter, Asynchronous and Synchronous counters.		Chalk & Board	Verification of truth tables of counters using ICs during lab session.
7	September 3rd Week 3	IV	Logic families –TTL and CMOS – characteristics.		Chalk & Board	Construction and verification of truth tables of counters using flip-flops.
8	September 4th Week 3	IV	D/A and A/D converters.		Chalk & Board	
9	October 1st Week 2	IV	Memory-classification, RAM and ROM.		Chalk & Board	

Learning outcomes: On completion of course students will be able to design digital logic circuits and understand the details of computer hardware.

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
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Saidabad, Secunderabad-500 059

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Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
An autonomous college affiliated to Osmania University
Program – B Sc MECs III Year
Course – Electronics-8085 Microprocessors EL524A
2019 - 20

Name of the faculty: TVLNH PRASAD	Department: ELECTRONICS	Year/Semester: III year / V	No. of classes per week: 3 / credits 3

Learning objectives:

The architecture of 8085 processor, assembly language programming and interfacing with various modules

To develop skill in simple program writing for 8085 applications

To understand the basic idea about the data transfer schemes and its applications

Interfacing concepts, program and operate applications for microprocessor systems

S.No	*Month & Week*	*Unit*	*Syllabus*	*Additional Input / value addition*	*Teaching method*	*Student/learning activity*		
1	June 3rd Week	1	Introduction to memory organization	Classification of memory	Chalk and Board			
2	June 4th Week	1	Architecture of 8085 µp	Microcomputer, differences between µp & µC	Charts, Chalk and Board			
3	July 1st Week	1	Pin configuration of 8085µp	Types of pin configurations	Handouts of pin diagram of 8085, Chalk and Board			
4	2nd Week	2	Instruction set and addressing modes		Chalk and Board	Students will identify the addressing modes of different instructions		
5	3rd Week	2	Addition, subtraction, multiplication and division programs		Explanation of logic using Flow charts	Students will identify suitable instructions to implement the logic from flow charts		
6	4th Week	2	Largest / smallest, arranging the data in Ascending and Descending order		Explanation of logic using Flow charts	Students will identify suitable instructions to implement the logic from flow charts		
7	August 1st Week	3	Stack and Subroutines		Chalk and Board	Example programs will help student to understand the concept		
8	2nd Week	3	Time delays		Chalk and Board	Hardware programs will be implemented using this concept in lab		

9	3rd Week	3	Software and Hardw Interrupts	no programs	Chalk and Board			
10	4th Week	3	Timing Diagrams		PPT s for drawing timing diagrams			
11	September 1st Week	4	Data transfer Schemes, PPI 8255		Chalk and Board	General examples will be discussed in the class		
12	2nd Week	4	Keyboard and Display interfacing	Demo programs	Chalk and Board			
13	3rd Week	4	Seven segment LED interfacing	Demo programs	Chalk and Board	Hardware programs will be implemented using this concept in lab		
14	4th Week	4	Stepper Motor interfacing	Demo programs	Exhibit (Stepper motor) Demonstration with Model	Hardware programs will be implemented using this concept in lab		
15	October 1st Week		Revision					

Learning outcomes:
Define terms applicable to microcomputer, microprocessor, write programs using assembly language;
Can work with microprocessor based equipment and be capable of participating in product development efforts, including support and development of assembly language code.

Signature of the Faculty

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
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Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
An autonomous college affiliated to Osmania University
Program – B Sc MECs III Year
Course – Electronics-8085 Microprocessors EL524A
2019 - 20

Name of the faculty: M. Prasanna	Department: ELECTRONICS	Year/Semester: III year / V	No. of classes per week: 3 / credits 3

Learning objectives:

- The architecture of 8085 processor, assembly language programming and interfacing with various modules
- To develop skill in simple program writing for 8085 applications
- To understand the basic idea about the data transfer schemes and its applications
- Interfacing concepts, program and operate applications for microprocessor systems

No.	Month & Week	Unit	Syllabus	Additional Input / value addition	Teaching method	Student/learning activity		
	June 3rd Week	1	Introduction to memory organization	Classification of memory	Chalk and Board			
	June 4th Week	1	Architecture of 8085 µp	Microcomputer, differences between µp & µC	Charts, Chalk and Board			
	July 1st Week	1	Pin configuration of 8085µp	Types of pin configurations	Handouts of pin diagram of 8085, Chalk and Board			
	2nd Week	2	Instruction set and addressing modes		Chalk and Board	Students will identify the addressing modes of different instructions		
	3rd Week	2	Addition, subtraction, multiplication and division programs		Explanation of logic using Flow charts	Students will identify suitable instructions to implement the logic from flow charts		
	4th Week	2	Largest / smallest, arranging the data in Ascending and Descending order		Explanation of logic using Flow charts	Students will identify suitable instructions to implement the logic from flow charts		
	August 1st Week	3	Stack and Subroutines		Chalk and Board	Example programs will help student to understand the concept		
	2nd Week	3	Time delays		Chalk and Board	Hardware programs will be implemented using this concept in lab		

9	3rd Week	3	Software and Hardware Interrupts	Demo programs	Chalk and Board			
10	4th Week	3	Timing Diagrams		PPT s for drawing timing diagrams			
11	September 1st Week	4	Data transfer Schemes, PPI 8255		Chalk and Board	General examples will be discussed in the class		
12	2nd Week	4	Keyboard and Display interfacing	Demo programs	Chalk and Board			
13	3rd Week	4	Seven segment LED interfacing	Demo programs	Chalk and Board	Hardware programs will be implemented using this concept in lab		
14	4th Week	4	Stepper Motor interfacing	Demo programs	Exhibit (Stepper motor) Demonstration with Model	Hardware programs will be implemented using this concept in lab		
15	October 1st Week		Revision					

Learning outcomes:

Define terms applicable to microcomputer, microprocessor, write programs using assembly language;

Can work with microprocessor based equipment and be capable of participating in product development efforts, including support and development of assembly language code.

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Dept. of Physics & Electronics
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Bhavan's Vivekananda College

of Science, Humanities and Commerce

Autonomous – Affiliated to Osmania University

TEACHING PLAN: ~~2018-19~~ 2019-20

Program: *B.Sc(MPCs)* Course Title: WAVES AND OSCILLATIONS (PH223)

Name of the faculty: **Mrs T Sai Santoshi**	Department: **PHYSICS**	Year/Semester: **I/II**	No. of classes per week: **4**
Learning objectives: *To introduce the students to fundamental concepts of wave mechanics and provide a foundation for more advanced topics in waves.*			

S.No.	*Month & Week*	*Unit*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Review*	*HOD Signature* (mam's)
1	November 4th week	I	Simple harmonic oscillator, and solution of the differential equation- Physical characteristics of SHM,		Chalk & board	Solving exercise problems on SHM	Completed	
2	December 1st week	I	Torsion pendulum, - measurements of rigidity modulus, compound pendulum, measurement of 'g'.		Chalk & board	Assignment	Completed	
3	December 2nd week	I	Addition of two simple harmonic motions with different frequencies and phases, addition of many simple harmonic motions		Chalk , board & PPT		Completed	
4	December 3rd week	I	combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures.		Chalk , board & PPT		Completed	
5	December 4th week	II	Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy consideration with under damped harmonic oscillator,	Applications with regards to high and low damping	Chalk & board	Solving exercise problems on damped motion	Completed	
6	January 1st week	II	Logarithmic decrement, relaxation time. quality factor. Forced oscillations. differential equation of forced oscillator and its solution.		Chalk & board	Solving exercise problems Assignment	Completed	
7	January 2nd week	II	amplitude resonance, velocity resonance Power considerations, quality factor, sharpness and Band width for resonance.		Chalk & board	Solving exercise problems	Completed	

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8	January 3rd week	II	Fourier theorem and evaluation of the Fourier coefficients		Chalk & board	Solving exercise problems	Completed	
9	January 4th week	III	Analysis of periodic functions-square, triangular, saw-tooth functions. Fourier energy theorem.		Chalk board & PPT		completed	
10	February 1st week	III	Ultrasonic's, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves.			Assignment	Completed in feb 1st week	
11	February 2nd week	III	Velocity of ultrasonics in liquids by Sear's method. Applications of ultrasonic waves. Ultrasonic's, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves.		Chalk , board & PPT	Solving exercise problems	completed in feb 2nd week	
12	February 3rdweek	IV	Expression for velocity. Modes of vibration of stretched string clamped at both ends, overtones, energy transport, transverse impedance. Reflection and transmission of waves.	Importance of different modes of vibrations with reference to tuning of musical instruments	Chalk & board		Ultrasonics Production, detection,	
13	February 4th week	IV	. Longitudinal vibrations in bars – wave equation and its general solution. Expression for velocity. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point		Chalk & board		Completed in 4th feb week	
14	March 1ST week	IV	iii) bar free at both ends iv) bar fixed at one end free at other end.		Chalk & board	Assignment		
15								

Learning outcomes: *Having completed this course, student should be capable of applying principles of wave superposition to various fields of physics.*

Santoshi

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
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Saifabad, Secunderabad-500 004

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Bharatiya Vidya Bhavan

Bhavan's Vivekananda College

of Science, Humanities and Commerce

Autonomous – Affiliated to Osmania University

TEACHING PLAN: Ac. yr 2019-20

Program: *B.Sc(MPCs)* **Course Title:** WAVES AND OSCILLATIONS (PH223)

Name of the faculty:	Department:	Year/Semester:	No. of classes per week:
Mrs V.R. Manjula	**PHYSICS**	**II**	**4**

Learning objectives: *To introduce the students to fundamental concepts of wave mechanics and provide a foundation for more advanced topics in waves.*

S.No.	*Month & Week*	*Unit*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Review*	*Signature*
1	November 4th week	I	Simple harmonic oscillator, and solution of the differential equation- Physical characteristics of SHM,		Chalk & board	Solving exercise problems on SHM	Completed JB	
2	December 1st week	I	Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy consideration with under damped harmonic oscillator,	Applications with regards to high and low damping	Chalk & board	Assignment	Under excitation damping to be done JB	
3	December 2nd week	I	Logarithmic decrement, relaxation time, quality factor. Forced oscillations, differential equation of forced oscillator and its solution		Chalk board & PPT		Completed JB	Brinda
4	December 3rd week	I	Amplitude resonance & velocity resonance. Power considerations, quality factor, sharpness and Band width for resonance. Electrical circuit comparison	LCR circuit resonance demonstration	Chalk board & PPT		Completed Demonstration to be done in lab JB	
5	December 4th week	II	Addition of two simple harmonic motions with different frequencies and phases, Addition of many simple harmonic motions. Combination of two mutually perpendicular1:1 ratio		Chalk & board	Solving exercise problems on damped motion	Completed JB	Brinda
6	January 1st week	II	Lissajous figures. Torsion pendulum, - measurements of rigidity modulus,		Chalk & board	Solving exercise problems Assignment	Completed Lissajous figures JB using CRO & Function Generator	Brinda GK

7	January 2nd week	II	compound pendulum measurement of 'g'. Fourier theorem and evaluation of the Fourier coefficients		Chalk & board	Solving exercise problems	Completed	
8	January 3rd week	II	Analysis of periodic functions-square. Triangular, saw-tooth functions. Fourier energy theorem.		Chalk & board	Solving exercise problems	Square, Saw tooth & Triangular Completed Energy theorem to be done	
9	January 4th week Ex & Week	III	Ultrasonic's, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves. Velocity of ultrasonics in liquids by Sear's method. Applications of ultrasonic waves.		Chalk board & PPT		Ultrasonics to be done later. Completed Vibrations in strings, velocity, modes of vibration	Principles 6/2
10	February 1st week	III	Transverse wave propagation along a stretched string, general solution of wave equation and its significance, Expression for velocity			Assignment	Completed Also completed Energy transport & Impedance	
11	February 2nd week	III	Modes of vibration of stretched string clamped at both ends, overtones, energy transport, transverse impedance. Reflection and transmission of waves.	Significance of different modes of vibrations with reference to tuning of musical instruments	Chalk , board & PPT		Solutions for bars. Completed bars	
12	February 3rd week	IV	Longitudinal vibrations in bars – wave equation and its general solution. Expression for velocity. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point		Chalk & board	Solving exercise problems	Ultrasonics Detection methods Velocity & applications Completed	Principles
13	February 4th week	IV	iii) bar free at both ends iv) bar fixed at one end free at other end.		Chalk & board		Production Methods	
14	March 1st week	IV	Revision and tests		Chalk & board	Assignment		

Learning outcomes: *Having completed this course, student should be capable of applying principles of wave superposition to various fields of physics.*

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Bhavan's Vivekananda College of Science, Humanities and Commerce

Autonomous – Affiliated to Osmania University

TEACHING PLAN: 2019-20

Program: *B.Sc (MPCs)* Course Title: OPTICS (PH423)

Name of the faculty: **Dr. GSVRK CHOUDARY**	Department: **PHYSICS & ELECTRONICS**	Year/Semester: **IV**	No. of classes per week: **4**
Learning objectives: *This course introduces the formalism of wave behavior in the context of physical optics.*			

S.No.	*Month & Week*	*Unit*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student /learning activity*	*REVIEW*
1	November 4th week	I	Introduction to aberrations, Chromatic aberration: Achromatic doublet-lenses in contact and separated by a distance. Monochromatic aberrations- spherical aberration,		Chalk & board	Solving problems Assignment	Completed
2	December 1st week	I	Methods of minimizing spherical aberration, coma, and astigmatism. Principal of superposition of waves Coherence, temporal and spatial coherence, conditions for Interference of light		Chalk & board PPT		Completed
3	December 2nd week	I	Young's double slit experiment. Theory of interference. Fresnel's Bi-prism: Determination of wave length of light, determination of thickness of a transparent material using Bi-prism. Change of phase on reflection, Lloyd's mirror experiment.		Chalk & board PPT	Solving problems	Completed
4	December 3rd week	II	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 and without contact between lens and glass plate, Newton's rings in transmitted light Determination of wave length of monochromatic light.		Chalk & board PPT	Solving problems	Completed
5	December 4th week	II	Michelson's Interferometer: Types of fringes, Determination of wavelength of monochromatic light, Difference in wavelength of sodium D_1 D_2 lines and thickness of a thin transparent plate, refractive index and visibility of fringes	Application of interference	Chalk & board PPT	Solving problems Assignment	Completed
6	January 1st week	III	Introduction: Distinction between Fresnel and Fraunhofer diffraction. Fraunhofer diffraction: Diffraction due to single slit and circular aperture. Limit of resolution.		Chalk & board PPT		Completed
7	January 2nd week	III	Fraunhofer diffraction due to double slit, Fraunhofer diffraction pattern with N slits (diffraction grating). Resolving		Chalk & board		Completed

			Power of grating-derivation.		PPT		
8	January 3rd week	III	Determination of wave length of light in normal and oblique incidence methods by using diffraction grating.		Chalk & board PPT	Solving problems	Completed
9	January 4th week	III	Fresnel diffraction: Fresnel's half period zones, area of the half period zones. zone plate – Comparison of zone plate with convex lens, Phase reversal zone plate. Diffraction at a straight edge. Distinction between interference and diffraction.	Applications of diffraction with regards to measurement of crystallite size	Chalk & board PPT	Assignment	Completed
10	February 1st week	IV	Polarized light : Methods of Polarization, Polarization by reflection, refraction, Double refraction, selective absorption.		Chalk & board PPT		Completed
11	February 2nd week	IV	Scattering of light, Brewster's law, Malus law, Nicol prism: polarizer, analyzer. Refraction of plane wave incident on negative and positive crystals- Huygen's explanation.		Chalk & board PPT		Completed
12	February 3rd week	IV	Quarter wave plate and half wave plate. Babinet's compensator: Optical activity. Laurent's half shade polarimeter: Analysis of light.	Importance of polarization with specific examples	Chalk & board PPT	Solving problems	Completed
13	February 4th week	IV	Lasers: Introduction: Spontaneous emission and Stimulated emission. Population inversion. Principle of Laser – Einstein coefficients. Types of Lasers: He-Ne laser, Ruby laser and Solid state laser.		Chalk & board	Assignment	Completed during the week
14	March 1ST week	IV	Pumping methods. Applications of lasers.		Chalk & board		Complete in Feb 4th week
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Outcome: Having Completed this course, student should acquire knowledge of analysing optical systems using System matrices, interference, diffraction and polarisation effects

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Bhavan's Vivekananda College of Science, Humanities and Commerce

Autonomous – Affiliated to Osmania University

TEACHING PLAN: 2019-20

Program: *B.Sc (MPCs)* Course Title: OPTICS (PH423)

Name of the faculty: ASIYA SULTANA AHMED	Department: PHYSICS & ELECTRONICS	Year/Semester: IV	No. of classes per week: 4
Learning objectives: *This course introduces the formalism of wave behavior in the context of physical optics.*			

S.No.	*Month & Week*	*Unit*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student /learning activity*	*REVIEW*
1	November 4th week	I	Introduction to aberrations, Chromatic aberration: Achromatic doublet-lenses in contact and separated by a distance. Monochromatic aberrations- spherical aberration,		Chalk & board	Solving problems Assignment	Completed
2	December 1st week	I	Methods of minimizing spherical aberration, coma, and astigmatism. Principal of superposition of waves Coherence, temporal and spatial coherence, conditions for Interference of light		Chalk & board PPT		Completed
3	December 2nd week	I	Young's double slit experiment. Theory of interference. Fresnel's Bi-prism: Determination of wave length of light, determination of thickness of a transparent material using Bi-prism. Change of phase on reflection, Lloyd's mirror experiment.		Chalk & board PPT	Solving problems	Completed
4	December 3rd week	II	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 and without contact between lens and glass plate, Newton's rings in transmitted light Determination of wave length of monochromatic light.		Chalk & board PPT	Solving problems	Completed
5	December 4th week	II	Michelson's Interferometer: Types of fringes, Determination of wavelength of monochromatic light, Difference in wavelength of sodium D_1 D_2 lines and thickness of a thin transparent plate, refractive index and visibility of fringes	Application of interference	Chalk & board PPT	Solving problems Assignment	Completed
6	January 1st week	III	Introduction: Distinction between Fresnel and Fraunhofer diffraction. Fraunhofer diffraction: Diffraction due to single slit and circular aperture, Limit of resolution.		Chalk & board PPT		Completed
7	January 2nd week	III	Fraunhofer diffraction due to double slit. Fraunhofer diffraction pattern with N slits (diffraction grating). Resolving		Chalk & board		Completed

	2nd week	II & IV	application as voltage regulator Binary number system: Converting Binary to Decimal and vice versa		Chalk & board		Completed	
8	January 3rd week	IV	Binary addition and subtraction (1's and 2's complement methods) Hexadecimal number, system. Conversion from Binary to Hexadecimal–vice versa and Decimal to Hexadecimal vice versa.		Chalk & board	Solving, conversions	Completed	
9	January 4th week	IV	Logic gates: OR, AND, NOT gates, truth tables, realization of these gates using discrete components. NAND, NOR as universal gates, Exclusive – OR gate		PPT	Solving, conversions	Completed	
10	February 1st week	IV &III	De Morgan's Laws– Statement and Proof, Half and Full adders. p n p and n p n transistors (Working).		PPT+ Chalk & board		Completed	
11	February 2nd week	III	Current components in transistors (Two Port model)	Applications of logic gates in computers	Chalk & board		Completed	
12	February 3rd week	III	CB, CE and CC configurations, h-parameters Concept of transistor biasing. Operating point		Chalk & board		Completed	
13	February 4th week	III	Fixed bias and self bias (Qualitative only), Transistor as an amplifier. Concept of feedback. Barkhausen criterion, RC Coupled Amplifier		Chalk & board	Solving exercise problems	Completed	
14	March 1ST week	III	Phase Shift Oscillator - Revision		Chalk & board		Completed	
15								

Learning outcomes: *Having completed this course, student should understand the behavior of basic electronic devices, principles of operation and design concepts and analysis of circuits built using these devices.*

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TEACHING PLAN: 2019-20

Program: *B.Sc (MPCs)* Course Title: MODERN PHYSICS (PH623)

Name of the faculty: **T. SAI SANTOSHI**	Department: **PHYSICS & ELECTRONICS**	Year/Semester: **VI**	No. of classes per week: **3**
Learning objectives: *This course is a prerequisite to any advanced theoretical studies. The student is introduced to the fundamental aspects of Quantum Mechanics and Nuclear Physics through this course.*			

S.No.	*Month & Week*	*Unit*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student /learning activity*	*REVIEW*
1	November 4th week	I	Spectral Radiation: Black Body Radiation, Ultraviolet catastrophe, Plank's Law – Quantum Principles. Photoelectric Effect: Experiment, Laws & Einstein's theory.		Chalk & board	Solving problems Assignment	Completed &
2	December 1st week	I	Compton's Effect: Expression and Experimental verification. Pair Production.		Chalk & board PPT		Completed &
3	December 2nd week	I	De- Broglie's hypothesis – Matter waves, properties of matter waves, Phase and Group velocities. Davisson and Germer experiment, double slit experiment, consequences of de-Broglie theory.		Chalk & board PPT	Solving problems	Completed &
4	December 3rd week	II	Heisenberg's uncertainty principle for position and momentum, Energy and time: Experimental verifications - Gamma ray microscope, Diffraction by a single slit. Applications: Position of electron in a Bohr's orbit. Particle in a box as a consequence of uncertainty principle.	Importance of matter waves and their impact on technology innovation	Chalk & board PPT	Solving problems	Completed &
5	December 4th week	II	Schrodinger time independent and time dependent wave equations. Interpretation of wave function.	Application of interference	Chalk & board PPT	Solving problems Assignment	Completed &
6	January 1st week	III	Momentum and energy operators, stationary states, linearity and expectation values. Current densities in one dimension. Normalization of Wave function.		Chalk & board PPT		Completed &
7	January 2nd week	III	Postulates of wave mechanics. Eigen functions and Eigen values. Applications: Particle in a box (one dimension).		Chalk & board PPT		Completed &
8	January 3rd week	III	Quantum tunneling (one dimension): across a step potential and across a rectangular potential barrier, α decay as an example.		Chalk & board PPT	Solving problems	Completed &
9	January 4th week	III	Nuclear properties – Size, charge, mass, spin, magnetic dipole moment and electric quadruple moment. Non-existence of an electron inside the nucleus – a consequence of the uncertainty		Chalk & board PPT	Assignment	Completed &

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			principle. Binding Energy of nucleus.				
10	February 1st week	IV	Semi empirical mass formula. Deuteron binding energy. Nature of nuclear forces. Nuclear Models: liquid drop model, shell model, Collective model.		Chalk & board PPT		Completed
11	February 2nd week	IV	Proportional counter, GM counters, scintillation counter, Wilson cloud chamber and solid state detector		Chalk & board PPT		Completed
12	February 3rd week	IV	Radioactivity: stability of nucleus; Law of radioactive decay; Mean life & half-life; Alpha decay – Gamow's tunneling theory of α decay. Derivation for decay constant.		Chalk & board PPT	Solving problems	Completed
13	February 4th week	IV	Beta Decay and Neutrino discovery. Fermi theory of β decay. Solar - neutrino mystery.		Chalk & board	Assignment	Completed
14	March 1ST week	IV	Types of nuclear reactions, conservation laws, Compound nucleus and Direct reactions (concepts).		Chalk & board		→ Completed in Feb 4th week
15							

Outcome

Having done the course the student gains sufficient knowledge as to

- *Understand the complementary nature of the wave and particle properties of a material particle*
- *Apply the Schrödinger's time independent equation to any given system with a specified potential and hence find the solution*
- *Get an insight to basic nuclear structure, models and transformations*
- *Understand the decay of Radioactive particles such as α particle in terms of quantum mechanical tunneling*

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TEACHING PLAN: 2019-20

Program: *B.Sc (MPCs)* Course Title: MODERN PHYSICS (PH623)

Name of the faculty: **Dr. GSVRK CHOUDARY**	Department: **PHYSICS & ELECTRONICS**	Year/Semester: **VI**	No. of classes per week: **3**
Learning objectives: *This course is a prerequisite to any advanced theoretical studies. The student is introduced to the fundamental aspects of Quantum Mechanics and Nuclear Physics through this course.*			

S.No.	*Month & Week*	*Unit*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student /learning activity*	*REVIEW*
1	November 4th week	I	Spectral Radiation: Black Body Radiation. Ultraviolet catastrophe. Plank's Law – Quantum Principles. Photoelectric Effect: Experiment. Laws & Einstein's theory.		Chalk & board	Solving problems Assignment	Completed
2	December 1st week	I	Compton's Effect: Expression and Experimental verification. Pair Production.		Chalk & board PPT		Completed
3	December 2nd week	I	De- Broglie's hypothesis – Matter waves, properties of matter waves. Phase and Group velocities. Davisson and Germer experiment. double slit experiment, consequences of de-Broglie theory.		Chalk & board PPT	Solving problems	Completed
4	December 3rd week	II	Heisenberg's uncertainty principle for position and momentum. Energy and time: Experimental verifications - Gamma ray microscope. Diffraction by a single slit. Applications: Position of electron in a Bohr's orbit. Particle in a box as a consequence of uncertainty principle.	Importance of matter waves and their impact on technology innovation	Chalk & board PPT	Solving problems	Completed
5	December 4th week	II	Schrodinger time independent and time dependent wave equations. Interpretation of wave function.	Application of interference	Chalk & board PPT	Solving problems Assignment	Completed
6	January 1st week	III	Momentum and energy operators, stationary states, linearity and expectation values. Current densities in one dimension. Normalization of Wave function.		Chalk & board PPT		Completed
7	January 2nd week	III	Postulates of wave mechanics. Eigen functions and Eigen values. Applications: Particle in a box (one dimension).		Chalk & board PPT		Completed
8	January 3rd week	III	Quantum tunneling (one dimension): across a step potential and across a rectangular potential barrier. α decay as an example		Chalk & board PPT	Solving problems	Completed
9	January 4th week	III	Nuclear properties. Size, charge, mass, spin, magnetic dipole moment and electric quadruple moment. Non-existence of an electron inside the nucleus: a consequence of the uncertainty		Chalk & board PPT	Assignment	Completed

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			principle. Binding Energy of nucleus.				
10	February 1st week	IV	Semi empirical mass formula. Deuteron binding energy. Nature of nuclear forces. Nuclear Models: liquid drop model, shell model, Collective model.		Chalk & board PPT		Completed
11	February 2nd week	IV	Proportional counter, GM counters, scintillation counter, Wilson cloud chamber and solid state detector		Chalk & board PPT		Completed
12	February 3rd week	IV	Radioactivity: stability of nucleus: Law of radioactive decay; Mean life & half-life; Alpha decay – Gamow's tunneling theory of α decay. Derivation for decay constant.		Chalk & board PPT	Solving problems	Completed
13	February 4th week	IV	Beta Decay and Neutrino discovery. Fermi theory of β decay. Solar - neutrino mystery.		Chalk & board	Assignment	Completed
14	March 1ST week	IV	Types of nuclear reactions, conservation laws, Compound nucleus and Direct reactions (concepts).		Chalk & board		Completed in Jan
15							

Outcome

Having done the course the student gains sufficient knowledge as to

- *Understand the complementary nature of the wave and particle properties of a material particle*
- *Apply the Schrödinger's time independent equation to any given system with a specified potential and hence find the solution*
- *Get an insight to basic nuclear structure, models and transformations*
- *Understand the decay of Radioactive particles such as α particle in terms of quantum mechanical tunneling*

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TEACHING PLAN: Ac. yr 2019-20

Program: B.Sc(MPCs) Course Title : ELECTRONICS (PH623A)

Name of the faculty: **Mrs V.R. Manjula**	Department: **PHYSICS**	Year/Semester: **VI**	No. of classes per week: **3**

Learning objectives: *The objective of this course is to introduce students to the basic components of electronics: diodes, transistors, and op amps. It covers the basic operation and some common applications.*

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Review*	*Signature*
1	November 4th week	I	Kirchhoff Laws, Study of growth and decay of current/charge in LR		Chalk & board	Solving exercise problems	Kirchoff's laws completed, Growth & decay to be done JZ	Promise
2	December 1st week	I	Study of growth and decay of current/charge in CR, LCR circuits, Alternating current relation between current and voltage in pure R, C, L	Comparison with mechanical oscillator	Chalk & board	Solving exercise problems	LCR series completed ac in pure L & C to be done JZ	
3	December 2nd week	I	Alternating current relation between current and voltage in R L , R C , R L C , vector diagrams		Chalk & board		Completed JZ	
4	December 3rd week	I & II	Power in ac circuits. LCR Series resonant circuit, Parallel resonant circuit – Q-factor. Formation of energy bands in solids	Significance of resonance in electrical tuning circuits	Chalk & board	Solving exercise problems	LCR-Series resonance - Completed Parallel resonant ckt & energy band formation to be done JZ	
5	December 4th week	II	Classification of solids in terms of energy band diagram, Intrinsic and extrinsic semiconductors,	PPT	Chalk & board	Solving exercise problems	Completed JZ	Promise
6	January 1st week	II	Fermi level, continuity equation, p-n junction diode, Half wave and Full wave rectifiers and filters, ripple factor.		Chalk & board		Not Done. To be done next week JZ.	

7	January 2nd week	II & IV	Characteristics of Zener diode and its application as voltage regulator Binary number system: Converting Binary to Decimal and vice versa		Chalk & board		Rectifiers and filters completed Conversion not done yet	
8	January 3rd week	IV	Binary addition and subtraction (1's and 2's complement methods) Hexadecimal number system. Conversion from Binary to Hexadecimal – vice versa and Decimal to Hexadecimal vice versa,	Class reversal	Chalk & board	Solving, conversions	Zener Regulator & applications completed Digital conversion to be done yet	
9	January 4th week & 5 week	IV	Logic gates: OR, AND, NOT gates, truth tables, realization of these gates using discrete components. NAND, NOR as universal gates, Exclusive – OR gate	Experimental demonstration	PPT	Solving, conversions	logic Gates Universal not completed yet.	Possibles
10	February 1st week	IV &III	De Morgan's Laws– Statement and Proof, Half and Full adders. p n p and n p n transistors(Working).		PPT+ Chalk & board		Completed yet	
11	February 2nd week	III	Current components in transistors (Two Port model) CB,CE and CC configurations	Applications of logic gates	Chalk & board		Completed yet	
12	February 3rd week	III	h-parameters Concept of transistor biasing, Operating point. Fixed bias and self bias (Qualitative only),		Chalk & board		Completed yet	
13	February 4th week	III	Transistor as an amplifier, Concept of feedback. Barkhausen criterion, RC Coupled Amplifier, Phase Shift Oscillator		Chalk & board	Solving exercise problems	Completed yet	Possibles
14	March 1ST week	V	Revision					
15								

Learning outcomes: *Having completed this course, student should understand the behavior of basic electronic devices, principles of operation and design concepts and analysis of circuits built using these devices.*

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TEACHING PLAN: 2019-20

Program: *B.Sc(MPCs)* Course Title : ELECTRONICS (PH623A)

Name of the faculty: **Ms ASIYA SULTANA AHMED**	Department: **PHYSICS & ELECTRONICS**	Year/Semester: **III/VI**	No. of classes per week: **3**

Learning objectives: *The objective of this course is to introduce students to the basic components of electronics: diodes, transistors, and op amps. It covers the basic operation and some common applications.*

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Review*	*Signature*
1	November 4th week	I	Kirchhoff Laws, Study of growth and decay of current/charge in LR		Chalk & board	Solving exercise problems	Completed	
2	December 1st week	I	Study of growth and decay of current/charge in CR, LCR circuits, Alternating current relation between current and voltage in pure R, C, L		Chalk & board	Solving exercise problems	Completed	
3	December 2nd week	I	Alternating current relation between current and voltage in RL, RC, RLC, vector diagrams		Chalk & board		Completed	
4	December 3rd week	I & II	Power in ac circuits, LCR Series resonant circuit, Parallel resonant circuit, Q-factor, Formation of energy bands in solids	Importance of resonance in tuning radio and television	Chalk & board	Solving exercise problems	Completed	
5	December 4th week	II	Classification of solids in terms of energy band diagram, Intrinsic and extrinsic semiconductors, Fermi level, continuity equation.		PPT + Chalk & board	Solving exercise problems	Completed	
6	January 1st week	II	p-n junction diode , Half wave and Full wave rectifiers and filters, ripple factor.		Chalk & board		Completed	
7	January		Characteristics of Zener diode and its					

			Power of grating-derivation.		PPT		
8	January 3rd week	III	Determination of wave length of light in normal and oblique incidence methods by using diffraction grating.		Chalk & board PPT	Solving problems	Completed
9	January 4th week	III	Fresnel diffraction: Fresnel's half period zones, area of the half period zones. zone plate – Comparison of zone plate with convex lens, Phase reversal zone plate. Diffraction at a straight edge. Distinction between interference and diffraction.	Applications of diffraction with regards to measurement of crystallite size	Chalk & board PPT	Assignment	Completed
10	February 1st week	IV	Polarized light : Methods of Polarization, Polarization by reflection, refraction, Double refraction, selective absorption.		Chalk & board PPT		Completed
11	February 2nd week	IV	Scattering of light, Brewster's law, Malus law, Nicol prism: polarizer, analyzer. Refraction of plane wave incident on negative and positive crystals- Huygen's explanation.		Chalk & board PPT		Completed
12	February 3rd week	IV	Quarter wave plate and half wave plate. Babinet's compensator: Optical activity. Laurent's half shade polarimeter: Analysis of light.	Importance of polarization with specific examples	Chalk & board PPT	Solving problems	Completed
13	February 4th week	IV	Lasers: Introduction: Spontaneous emission and Stimulated emission. Population inversion. Principle of Laser – Einstein coefficients. Types of Lasers: He-Ne laser, Ruby laser and Solid state laser.		Chalk & board	Student Presentations	Completed
14	March 1ST week	IV	Pumping methods, Applications of lasers.		Chalk & board		Completed
15							

Outcome: Having completed this course, student should acquire knowledge of analysing optical systems using system matrices, diffraction and polarisation effects.

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Program: B Sc MECS **Course Title: Semiconductor Devices** **Course Code: EL 224**

Academic Year 2019-20

Name of the faculty: T. Prasad	Department: Physics and Electronics	Year/Semester: I Year/2nd Semester	No. of classes per week: 4 Credits: 4
Learning objectives:	Understand the working and operation of semiconductor devices, their applications in Rectifiers, power supplies & amplifiers and in turn understand the capabilities and limitations of these devices.		

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*	*Review*	*Sign*
1	November 4th week	I	Review of basics of semiconductor Physics		Chalk & Board		completed	
2	December 1st week	I	Continuity equation PN Junction theory, VI Characteristics, Diode equation		Chalk & Board	• Problems on diodes • Study of VI Characteristics of diode during lab session	completed	
3	December 2nd week	I	Junction capacitance, Varactor diode, Characteristics		Chalk & Board			
4	December 3rd week	I	Zener diode-VI Characteristics-Application Tunnel Diode-characteristics	Assignment on applications of diodes-PN Junction, Zener, Varactor & Tunnel diodes	Chalk & Board Video of working of tunnel diode	• Problem solving on zener voltage regulator • Study of VI Characteristics of zener diode during lab sessions	completed	
5	December 4th week	II	PNP, NPN Transistors, Current components-Configurations		Chalk & Board		completed 31/12/19	31/12/2019

6	January 1st week	II	Static characteristics in CB, CE & CC Configurations		Chalk & Board	• Study of VI Characteristics of transistor in CE during lab sessions		
7	January 2nd week	II	Transistor as an amplifier, Transistor as two port network, h-parameters,		Chalk & Board	• Determination of h-parameters from the characteristic curves.		
8	January 3rd week	II	Load line analysis, Transistor biasing - fixed and self bias	Assignment on transistor characteristics	Chalk & Board			
9	January 4th week	III	FET-Classification Construction and characteristics		Chalk & Board	• Study of VI Characteristics of FET & determination of FET parameters during lab sessions		
10	February 1st week	III	FET parameters – applications MOSFET-Modes of operation, Applications		Chalk & Board			
11	February 2nd week	III	UJT-Construction, characteristics, application as relaxation oscillator		Chalk & Board	• Study of VI Characteristics of UJT & UJT relaxation oscillator during lab sessions		
12	February 3rd week	IV	Construction and characteristics of SCR, two transistor analogy, applications		Chalk & Board			
13	February 4th week	IV	Construction and characteristics of photo electronic devices-LDR, LED, Photodiode, phototransistor, Solar cell		Chalk & Board	• Study of solar cell characteristics during lab sessions		
14	March 1st week	IV	Revision	• Seminar presentations	PPT-Presentation			

Learning outcomes:

Students should be able to work with different types of semiconductor devices, understand their characteristics and applications.

25/1/2013.

Signature of the Faculty

Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
Vivekananda College
Saifabad, Secunderabad-500 063

11/03/2013

Signature of the HOD

Bharatiya Vidya Bhavan

Bhavan's Vivekananda College

of Science, Humanities and Commerce

Autonomous – Affiliated to Osmania University

ogram: B Sc MECS **Course Title: Semiconductor Devices** **Course Code: EL 224**

Academic Year 2019-20

ne of the faculty: M. Prasanna	Department: Physics and Electronics	Year/Semester: I Year/2nd Semester	No. of classes per week: 4 Credits: 4

rning objectives: Understand the working and operation of semiconductor devices, their applications in Rectifiers, power supplies & amplifiers and in turn understand the capabilities and limitations of these devices.

No.	Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Sign
	November 4th week	I	Review of basics of semiconductor Physics		Chalk & Board			
	December 1st week	I	Continuity equation PN Junction theory, VI Characteristics, Diode equation		Chalk & Board	• Problems on diodes • Study of VI Characteristics of diode during lab session	Completed	
	December 2nd week	I	Junction capacitance, Varactor diode, Characteristics		Chalk & Board		Completed.	
	December 3rd week	I	Zener diode-VI Characteristics-Application Tunnel Diode-characteristics	Assignment on applications of diodes-PN Junction, Zener, Varactor & Tunnel diodes	Chalk & Board Video of working of tunnel diode	• Problem solving on zener voltage regulator • Study of VI Characteristics of zener diode during lab sessions	completed.	
	December 4th week	II	PNP, NPN Transistors, Current components-Configurations		Chalk & Board		completed.	

6	January 1st week	II	Static characteristics in CB, CE & CC Configurations		Chalk & Board	• Study of VI Characteristics of transistor in CE during lab sessions		
7	January 2nd week	II	Transistor as an amplifier, Transistor as two port network, h-parameters,		Chalk & Board	• Determination of h-parameters from the characteristic curves.	completed.	
8	January 3rd week	II	Load line analysis, Transistor biasing - fixed and self bias	Assignment on transistor characteristics	Chalk & Board		completed.	
9	January 4th week	III	FET-Classification, Construction and characteristics		Chalk & Board	• Study of VI Characteristics of FET & determination of FET parameters during lab sessions		
10	February 1st week	III	FET parameters – applications MOSFET-Modes of operation, Applications		Chalk & Board		completed.	
11	February 2nd week	III	UJT-Construction, characteristics, application as relaxation oscillator		Chalk & Board	• Study of VI Characteristics of UJT & UJT relaxation oscillator during lab sessions	completed	
12	February 3rd week	IV	Construction and characteristics of SCR, two transistor analogy, applications		Chalk & Board			
13	February 4th week	IV	Construction and characteristics of photo electronic devices-LDR, LED, Photodiode, phototransistor, Solar cell		Chalk & Board	• Study of solar cell characteristics during lab sessions	completed	
14	March 1st week	IV	Revision	• Seminar presentations	PPT-Presentation			

Learning outcomes:

Students should be able to work with different types of semiconductor devices, understand their characteristics and applications.

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Bharatiya Vidya Bhavan's
Vivekananda College
Saifabad, Secunderabad-500 063

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BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES AND COMMERCE
Sainikpuri, Secunderabad-500094
An Autonomous College affiliated to Osmania University
TEACHING PLAN: 2019-20
Program: B. Sc (M/E/Cs)
Course Title: Operational Amplifiers and Analog communications

Name of the faculty: Mrs P.Lavanya	Department: Physics and Electronics	Year/Semester: IV	No. of Classes per week: 4 Credits : 4			

Learning Objective:

The course aims to -

- provide the basic education in linear integrated circuits; operational amplifiers - basic construction, characteristics, parameter limitations and its applications
- To give basic knowledge of analog communication.
- Become proficient with computer simulation skills (using multisim) for the analysis and design of circuits.
- Students will be made to understand the working of Operational Amplifier ICs and its applications.

S.No	Month & Week	Units	Syllabus	Additional Input/Value addition	Teaching Method	Student/ Learning activity	Review	Sign of teacher	Sign of HOD
1.	November 3rd week	I	Operational amplifiers - block diagram. equivalent circuit	Drawbacks of an Amplifier using discrete components	Chalk & Board		completed	Dewara.	
2.	November 4th week	I	Operational amplifiers – ideal characteristics. practical parameters.		Chalk & Board				Promises
3.	December 1st week	I	Differential amplifier	Emitter follower	Chalk & Board				
4.	December 2nd week	I	Op amp as inverting & non- inverting Amplifiers	Construction & demonstration of amplifier circuits	Chalk & Board	Numerical problems in Amplifiers – Inverting, Noninverting.	completed	Dewara	
5.	December 3rd week	II	Op amp applications		Chalk & Board	Construction and simulation of amplifier circuits			Promises

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S.No	Month & Week	Units	Syllabus	Additional Input/Value addition	Teaching Method	Student/ Learning activity	Review	Sign of teacher	Sign of HOD
6.	December 4th week	II	Op amp applications	Comparison of circuits with transistors	Chalk & Board	Solving numerical problems and simulations of Integrator, differentiator and comparator	completed	Lawa	Approved
7.	January 1st week	II	Waveform generators – sine, square, triangular	Comparison of circuits with transistors	Chalk & Board	Simulation of the circuits WBO and AMV using muitisim	completed	Lawa	
8.	January 2nd week	III	555 timer functional block diagram, Astable and monostable applications		Chalk & Board	Simulation of the circuits AMV and MMVwith 555 timer using multisim			
9.	January 3rd week	III	Amplitude Modulation	Demonstrate AM modulation and detection	Chalk & Board				Approved
10.	January 4th week	III	Demodulation		Chalk & Board				
12.	February 1st week	III	Frequency modulation	Demonstrate FM modulation and detection using trainer boards	Chalk & Board	List the transmission frequencies of AM and FM	completed	Lawa	
13.	February 2nd week	IV	FM Detection		Chalk & Board	Construct modulator and demodulator & simulate			Approved
14.	February 3rd week	IV	AM and FM transmitter and receivers	Demonstrate various blocks of a receiver in a radio.	Chalk & Board				
15.	February 4th week	IV	Pulse modulation	Applications will be discussed.	Chalk & Board				
16.	March 1st week		Revision				completed	Lawa	

Learning Outcomes:

After completion of this course students acquire experience in building and troubleshooting simple analog circuits using IC 741 and IC 555 in various applications.

After learning the course the students will be familiar with the fundamental concepts of analog communications, working of transmitter and receiver.

Signature of the faculty

Signature of the HOD

Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
Vivekananda College
Saifabad, Secunderabad-500 004

Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
Autonomous – Affiliated to Osmania University
Program – B.Sc III Year Electronics Course – 8051 Microcontroller
2019 - 20

Name of the faculty: TVLNH PRASAD	Department: ELECTRONICS	Year/Semester: III year / VI	No. of classes per week: 3 / credits 3

Learning objectives:

To understand the need of microcontrollers in embedded systems.
To understand architecture and features of typical microcontroller.
The 8051 architecture, instruction set, assembly language programs, serial communication and interfacing techniques
Programming and debugging skills.

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*		
1	Nov,4th week	1	Introduction to microcontroller and embedded systems, overview of 8051 family	Students will be introduced to microcontroller kits in lab	LCD projector is used to cover these fundamentals Chalk & Board		completed	
2	December 1st week	1	Block diagram of microcontroller, 8051 functions of each block		LCD projector Chalk & Board	Students will explain the details of selected part of block diagram	completed	
3	2nd week	1	Pin details of 8051 ALU, ROM, RAM memory organization of 8051, oscillator clock and SFRs		LCD projector Chalk & Board	Students will come with block diagram and pin diagram , list of SFRs	completed	Bosimick
4	3rd week	1	Program counter , PSW register, stack, i/o ports, serial port, timer, interrupts		Chalk & Board	Setting and resetting the bits of psw, register bank selection examples	completed	
5	4th week	2	Addressing modes of 8051, instruction set of 8051, classification of instructions	Simulation software is introduced	Chalk & Board	Examples are given to identify the types of addressing modes and instructions	completed 31/12/19	Bosimick 31/12
6	January 1st week	2	Data transfer , arithmetic and branching instructions programming		Chalk & Board Flow charts are drawn on board to explain the logics of the programs	Example programs	completed	

7	2nd week	2	Bit manipulation instructions and simple programs using these instructions		Chalk & Board Flow charts are drawn on board to explain the logics of the programs	Example programs	Completed	
8	3rd week	2	Programming using Logical instructions		Chalk & Board Flow charts are drawn on board to explain the logics of the programs	Example programs	Completed	
9	4th week	3	Addition subtraction multiplication and division Time delay programming	Programming will be practiced by students during lab sessions	Chalk & Board	Example programs	Completed	
10	February 1st week	3	Largest / smallest numbers ascending / descending order	Programming will be practiced by students during lab sessions	Chalk & Board	Example programs	Completed	
11	2nd week	3	BCD , HEX and ASCII code conversions, subroutines	Programming will be practiced by students during lab sessions	LCD projector Chalk & Board	Example programs	Completed	
12	3rd week	4	Interfacing ADC , DAC	Micro controller project Kits will be used to demonstrate the working of DAC and ADCs during lab sessions	Chalk & Board	Students will identify various applications using DAC and ADCs		
13	4th week	4	Waveform generation, interfacing LCD and display information		Keil software LCD projector Chalk & Board	Demos and video lectures	Completed	
14	March 1st week	4	Serial communication stepper motor interfacing		Keil software LCD projector Chalk & Board	Demos and video lectures	5/3/2025	4/03/2025
15	March 2nd week	4	Revision					

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
Vivekananda College
Kachkpuri, Secunderabad-500 009

26/10/2024
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Bharatiya Vidya Bhavan

Bhavan's Vivekananda College of Science, Humanities and Commerce
Autonomous – Affiliated to Osmania University
Program – B Sc(MECs) III Year 2019 - 20
Course – Electronics: 8051 Microcontroller

Name of the faculty: Mrs M. PRASANNA	Department: ELECTRONICS	Year/Semester: III year / VI	No. of classes per week: 3 / credits 3

Learning objectives:

To understand the need of microcontrollers in embedded systems.
To understand architecture and features of typical microcontroller.
The 8051 architecture, instruction set, assembly language programs, serial communication and interfacing techniques.
Programming and debugging skills.

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*		
1	Nov,4th week	1	Introduction to microcontroller and embedded systems, overview of 8051 family	Students will be introduced to microcontroller kits in lab	LCD projector is used to cover these fundamentals Chalk & Board			
2	December 1st week	1	Block diagram of microcontroller, 8051 functions of each block		LCD projector Chalk & Board	Students will explain the details of selected part of block diagram	completed	
3	2nd week	1	Pin details of 8051 ALU, ROM, RAM memory organization of 8051, oscillator clock and SFRs		LCD projector Chalk & Board	Students will come with block diagram and pin diagram , list of SFRs		
4	3rd week	1	Program counter , PSW register, stack, i/o ports, serial port, timer, interrupts		Chalk & Board	Setting and resetting the bits of psw, register bank selection examples	completed	
5	4th week	2	Addressing modes of 8051, instruction set of 8051, classification of instructions	Simulation software is introduced	Chalk & Board	Examples are given to identify the types of addressing modes and instructions		
6	January 1st week	2	Data transfer, arithmetic and branching instructions programming		Chalk & Board Flow charts are drawn on board to explain the logics of the programs	Example programs		

7	2nd week	2	Bit manipulation instructions and simple programs using these instructions		Chalk & Board Flow charts are drawn on board to explain the logics of the programs	Example programs		
8	3rd week	2	Programming using Logical instructions		Chalk & Board Flow charts are drawn on board to explain the logics of the programs	Example programs	Completed	
9	4th week	3	Addition subtraction multiplication and division Time delay programming	Programming will be practiced by students during lab sessions	Chalk & Board	Example programs		
10	February 1st week	3	Largest / smallest numbers ascending / descending order	Programming will be practiced by students during lab sessions	Chalk & Board	Example programs		
11	2nd week	3	BCD , HEX and ASCII code conversions, subroutines	Programming will be practiced by students during lab sessions	LCD projector Chalk & Board	Example programs		
12	3rd week	4	Interfacing ADC , DAC	Micro controller project Kits will be used to demonstrate the working of DAC and ADCs during lab sessions	Chalk & Board	Students will identify various applications using DAC and ADCs		
13	4th week	4	Waveform generation, interfacing LCD and display information		Keil software LCD projector Chalk & Board	Demos and video lectures	Completed	
14	March 1st week	4	Serial communication stepper motor interfacing		Keil software LCD projector Chalk & Board	Demos and video lectures		
15	March 2nd week	4	Revision					

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
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Malkajgiri Secunderabad-500 009

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Bhavan's Vivekananda College

of Science, Humanities and Commerce
Autonomous – Affiliated to Osmania University

Program: B Sc MECS **Course Title: Digital system design using VHDL** **Course Code: EL 624A**

Academic Year 2019-2020

Name of the faculty: Mrs P Lavanya	Department: Physics and Electronics	Year/Semester: IIIYear/6th Semester	No. of classes per week: 3 Credits: 3
Learning objectives: To learn hardware descriptive language and to write codes targeting Xilinx and FPGA devices.			

S.No.	Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Sign	Hod sign
1	November 4th Week	I	Introduction to VHDL		Chalk&Board		completed		
2	December 1stWeek	I	Entity and Architecture declaration Data objects and Classes		Chalk&Board	Introduction to Xilinx ISE simulator- A software tool for HDL design and simulation during lab session.	completed		
3	December 2ndWeek	I	Operators and data types		LCD	Modeling and simulation of gates during lab session.			
4	December 3rd Week	I	Introduction to behavioral, dataflow& structural model.		Chalk&Board				
5	December 4th Week	II	Process statement, Assignment statements, sequential statements and case statement.		Chalk&Board	Writing VHDL codes to design adders and subtractors			
6	January 1stWeek	II	Arrays &loops, concurrent statements		Chalk&Board		completed		
7 6	January 2ndWeek	II	Types of delays Structural modeling, component declaration &generics		Chalk&Board				

Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity	Review	Sign	Hod sign
January 3rd Week	III	VHDL models- simulation of mux,demux.decoders and encoders.		Chalk&Board	Designing other sequential circuits like mux and demux during lab session	completion		
January 4th Week	II	packages& libraries, Functions and procedures		Chalk&Board	Structural style modeling of decoders and encoders		Jawaver.	
February 1stWeek	III	VHDL models- Code converters and comparators.		Chalk&Board	Modeling comparator			
February 2ndWeek	III	VHDL models for Implementation of Boolean functions, sequential circuits- flip-flops- SR and JK.		Chalk&Board		completed	Jawaver	
February 3rd Week	IV	VHDL models- D and T flip-flops. Registers.		Chalk&Board	Design of flip flops			
February 4th Week	IV	VHDL models to design registers.		Chalk&Board				
March 1stWeek	IV	VHDL models to design counters- ripple counter and decade counter		Chalk&Board	Modeling sequential circuits like counters and registers.	Completed	Jawaver	

g outcomes: Learning outcomes: On completion of course students will be able to model, simulate and synthesis various digital circuits.

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Dept. of Physics & Electronics
Bharatiya Vidya Bhavan's
Vivekananda College
Kachiguda Secunderabad-500 027

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Bharatiya Vidya Bhavan

Bhavan's Vivekananda College
of Science, Humanities and Commerce
Autonomous – Affiliated to Osmania University

Program: BSc MECs **Course Title (paper title): Digital system design using VHDL- EL624A**

Name of the faculty: **Mrs B .Niraimathi &** **Mrs P.Lavanya**	**Department:** **Physics&Electronics**	**Year/Semester:** **Sem VI 2019-20**	**No. of classes per week: 3**
Learning objectives: To learn hardware descriptive language and to write codes targeting Xilinx and FPGA devices.			

S.No.	*Month & Week*	*Units*	*Syllabus*	*Additional Input/ value addition*	*Teaching method*	*Student/learning activity*
1	November 3rd Week	I	Introduction to VHDL		Chalk&Board	
2	November 4thWeek	I	Entity and Architecture declaration Data objects and Classes		Chalk&Board	Introduction to Xilinx ISE simulator-A software tool for HDL design and simulation during lab session.
3	December 1stWeek	I	Operators and data types		LCD	Modeling and simulation of gates during lab session.
4	December 2ndWeek	I	Introduction to behavioral, dataflow& structural model.		Chalk&Board	
5	December 3rd Week	II	Process statement, Assignment statements, sequential statements and case statement.		Chalk&Board	Writing VHDL codes to design adders and subtractors
6	December 4th Week	II	Arrays &loops, concurrent statements		Chalk&Board	
7	January 1stWeek	II	Types of delays Structural modeling, component declaration &generics		Chalk&Board	
8	January 2ndWeek	II	packages& libraries, VHDL models-simulation of Mux,Demux.		Chalk&Board	Designing other sequential circuits like mux and demux during lab session

9	January 3rd Week	III	VHDL models- simulation of decoders, and encoders.		Chalk&Board	Structural style modeling of decoders and encoders
S.No.	***Month & Week***	***Units***	***Syllabus***	***Additional Input/ value addition***	***Teaching method***	***Student/learning activity***
10	January 4th Week	III	VHDL models- Code converters and comparators.		Chalk&Board	Modeling comparator
11	February 1stWeek	III	VHDL models for Implementation of Boolean functions, sequential circuits-flip-flops- SR and JK.		Chalk&Board	
12	February 2ndWeek	IV	VHDL models- D and T flip-flops. Registers.		Chalk&Board	Design of flip flops
13	February 3rd Week	IV	VHDL models to design registers.		Chalk&Board	
14	February 4th Week	IV	VHDL models to design counters- ripple counter and decade counter		Chalk&Board	Modeling sequential circuits like counters and registers.
15	March 1stWeek		Revision		LCD	
Learning outcomes: On completion of course students will be able to model, simulate and synthesis various digital circuits.						

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Bharatiya Vidya Bhavan's
Vivekananda College
Malkajgiri, Secunderabad-500 009