EKLAVYA UNIVERSITY

ज्ञान प्राप्ये लक्ष्य संधानम्

Estd. by Madhya Pradesh Niji Vishwavidyalaya (Sthapna Avam Sanchalan) Adhiniyam 2020

School of Basic and Applied Sciences

Master of Science

Department of Physics

M.Sc. Previous Physics

Session 2020-21 Onwards

DETAILED CURRICULUM

Master of Science
Department of Physics

VISION STATEMENT OF EKLAVYA UNIVERSITY

Eklavya University, will transform lives and communities through learning.

MISSION STATEMENT OF EKLAVYA UNIVERSITY

- Nurture achievers in life and careers through a value based, industry relevant and future ready education.
- Emphasize research, interdisciplinary learning, and practical hands on education.
- Equip every student with the required social and technical skills to achieve employment generation.
- Provide a holistic education deeply rooted in the ways of the traditional Gurukul system.
- Bring quality education within the reach of every individual, by committing to the achievement and maintenance of excellence in education, research and innovation.
- Create and disseminate knowledge through research and creative inquiry.
- Serve students by teaching them problem solving, leadership and teamwork skills, lateral thinking, commitment to quality and ethical behaviour.
- Create a diverse community, open to the exchange of ideas, where discovery, creativity, and personal and professional development is encouraged and can flourish.
- Contribute to the social fabric and economic health of the Bundelkhand region, the state and the country at large, by enhancing and facilitating economic empowerment, providing equal opportunities and employment generation.

VISION STATEMENT OF PHYSICS DEPARTMENT

"To become a center of excellence in pure and applied physics"

- Department of Physics has a vision to build foundation for excellence and spur development of the institution as a premier institution by igniting and nurturing enthusiasm, interests and passion, in the study of physics, in professional courses, as part of curriculum.
- Our commitment lies in producing comprehensive knowledge seekers and humane individuals, capable of building a strong and developed nation.

MISSION STATEMENT OF PHYSICS DEPARTMENT

- To achieve the vision we should have diligent faculty who use effective teaching methodologies. To impart updated technical education and knowledge.
- To groom our young students to become professionally and morally sound.
- To reach global standards in production and value based living through an honest and scientific approach.

01/06/23 01.06.23 1/6/23 01/06/23

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Master of Science
Department of Physics

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1. Postgraduates will pursue higher studies in related fields including management and carry out research

PEO2. Postgraduates will perform as employers in private/government institutions rising up to top positions

PEO3. Postgraduates will become entrepreneurs

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Master of Science
Department of Physics

PROGRAMME OUTCOMES (POs)

PO1: Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2: Deeper understanding

To have a deeper understanding of a subject by the student for its application in addressing societal and scientific issues

PO3: Research and development

To prepare students for research and development in respective areas

PO4: Problem solution

Problem solving by applying reasoning and technical inputs.

PO5: Environment and sustainable development

To study and understand the impact of development on environment safety and its significance for sustainable ways of development.

PO6: Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

PO7: Leadership and self-reliance

Impart leadership abilities to the students to lead and excel in their respective fields. Also, the training will make students self-reliant.

Master of Science
Department of Physics

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO 1: Postgraduates will develop the critical analysis and problem-solving skills required in the application of principles of Physics.

PSO 2: Postgraduates will be prepared with a working knowledge of experimental/computational techniques and instrumentation required to work independently in research or industrial environments.

PSO 3: Postgraduates will have strong capability in organizing and presenting the acquired knowledge coherently both in oral and written discourse.

PSO 4: Postgraduates will successfully compete for current employment opportunities.

Master of Science

Department of Physics

CREDIT STRUCTURE

Category-wise Credit Distribution

Courses	Credits
Programme Core courses	48
Research Methodology	08
Project	20
Comprehensive Viva	04
Total	80

01/06/23 01.06.23 1/6/23
Shagufta 01/6/23

EKLAVYA UNIVERSITY, DAMOH (M.P.)

Scheme of Examination M.Sc I Year (Previous)

/For batch admitted in Academic Session 2023-24/

Subject wise distribution of marks and corresponding credits

S. No.	Subject Name	Subject Code	Paper Name	Maximum Marks Allotted													Total Marks	Contact Periods Per week			Total Credits
				Theory Slot											Practical Slot						
				Final Yearly					Half Yearly					Quiz/ Assignment/ Attendence	End Sem	Lab Work/ Sessional		L	T	P	
				P1	P2	P3	P4	P5	P1	P2	P3	P4	P5								
1	Common	MREMA20Y101	Research Methodology	30					15					5			50	4	4		8
4	Physics	MPHYS20Y101	Classical Mechanics and Mathematical Methods in Physics (Paper - I)	60					30					10			100	4			4
		MPHYS20Y102	Classical Electrodynamics (Paper - II)		60					30				10			100	4			4
		MPHYS20Y103	Quantum Mechanics, Atomic and molecular Physics (Paper - III)			60					30			10			100	4			4
		MPHYS20Y104	Electronics Numerical Methods and Computer Programming (Paper - IV)				60					30		10			100	4			4
		MPHYS20Y105	Paper- I and II Practical (Practical-I)												60	40	100			4	4
		MPHYS20Y106	Paper- III and IV Practical (Practical-II)												60	40	100			4	4

Induction programme of three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiencey Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.

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School of Basic & Applied Science

M.Sc. Phy.

Class			M.Sc. (P) Physics	
Semester/Year			I Year	
Subject			Physics	
Paper		English	Paper I - Classical Mechanics and Mathematical Methods in Physics (MPHYS20Y101)	
		fgUnh		
Max. Marks				
Credit		Total Credits		
L	T	P	4	
4	0	0		
Course Objective			1. To develop an understanding of Lagrangian and Hamiltonian formulation which allow for simplified treatments of many complex problems in classical mechanics and provides the foundation for the modern understanding of dynamics. 2. To provide students the ability to hone the mathematical skills necessary to approach problems in advanced physics courses.	
Course Outcome			1. The students will be able to apply the Variational principles to real physical problems. 2. The students will be able to model mechanical systems, both in inertial and rotating frames, using Lagrange and Hamilton equations. 3. The students will be able to understand and apply the mathematical skills to solve quantitative problems in the study of physics. 4. Will enable students to apply integral transform to solve mathematical problems of interest in physics. 5. The students will be able to use Fourier transforms as an aid for analyzing experimental data.	
Student learning outcome			Student will able to – 1. Demonstrate a rigorous understanding of the fundamentals of classical mechanics and mathematical methods, involved in theories & principles of physics. 2. Sharpen his skill and knowledge and utilize/apply his knowledge in further research and science.	
Unit			Syllabus	Periods
UNIT - I			Holonomic and non-holonomic constraints, D'Alembert's principle, generalized coordinates. Lagarngian, Lagrange's equation and its applications, velocity dependent, potential in Lagrangian formulation, generalized momentum, Legendre transformation, Hamiltonian, Hamilton's Canonical equation, calculus of variation and its application to simple problems, Hamilton's variational principle.	15

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UNIT - II	Derivation of Lagrange's and Hamilton's canonical equations from Hamilton's variational principle, extension of Hamilton's principle to non-conservative and non-holonomic systems, method of Lagrange's multipliers, conservation principle and Noeither's theorem, conservation of energy, linear momentum and angular momentum as a consequence of homogeneity of time and space and isotropy of space respectively.	15
UNIT - III	Canonical transformation, Integral invariants of Poincare, Lagrange's and Poisson brackets as canonical invariants, Equation of motion in Poisson bracket formulation, Infinitesimal canonical transformation and generators of symmetry, Liouville's theorem, Hamilton Jacobi equation and its applications. Action-angle, variables adiabatic invariance of action angle variables, Kepler problem in action angle variables, theory of small oscillations in Lagrangian formulation, normal coordinates and its application, orthogonal transformation, Eulerian angles, Euler theorem, eigen values of the inertia tensor, Euler equations, Force free motion of rigid body.	15
UNIT - IV	**Fourier transforms:** Fourier integrals, Fourier's transform and inversion theorem, Falting theorem, application of integral transforms to pulse propagation, Discrete Fourier transform, Fast Fourier transform, Laplace transform, Laplace transform of derivatives and integrals, derivatives integrals of Laplace transform, Laplace transform of periodic function, inverse Laplace transform, convolution theorem, impulsive functions, application of Laplace transform in solving linear differential equation with constant coefficients and with variable coefficients, linear partial differential equations.	15
UNIT - V	Analytic functions, Cauchy-Riemann conditions, Harmonic function, elementary complex functions and their properties, mapping Z and Z complex integration, definite integrals, Cauchy Gaursat's theorem, Cauchy integral theorem, Indefinite integrals, Cauchy integral formula, Morera's theorem, Fundamental theorem of algebra, analytic continuation, branches of multi valued function. Taylor's series, Laurent's series, integration and differentiation of power series, zeros of analytic functions, singular point, residues, Cauchy residue theorem, poles evaluation of improper integrals, Jordan's lemma, integration around a branch point, multi valued functions.	15

References:

1. Classical Mechanics: Goldstein
2. Classical Mechanics: L.P. Landau & H. M. Lifshitz
3. Classical Mechanics: A. Ray Chaudhary
4. Complex Variables & Functions: Churchill, Brown, Varchy
5. Applied Mathematics for Engineers and Physicist: Pipes & Harvill
6. Mathematical Methods: Potter &Goldberg
7. Mathematical Methods for Physicist: George Arkfen
8. Mathematical Physics: A. Ghatak (McMillan)

01/06/23 01.06.23 1/6/23

School of Basic & Applied Sciences

Class			M.Sc. (P) Physics	
Semester/Year			I Year	
Subject			Physics	
Paper	English		Paper II - Classical Electrodynamics(MPHYS20Y102)	
	fgUnh			
Max. Marks				
Credit	Total Credits			
T	P			
4	0	0	4	
Course Objective	1. To understand and evaluate fields and forces in Electrodynamics and Magneto dynamics. 2. To provide concepts of relativistic electrodynamics and its applications in branches of Physical Sciences.			
Course Outcome	Student will understand - 1. The fundamental of Elecrtostatics and Magnetostatics its related boundary value problems. 2. Multipoles, Electrostatics of macroscopic media dielectrics, Time Varying Fields, Maxwell's Equations, Conservation Laws, Plane Electromagnetic Waves and Wave Equation. 3. Magneto Hydrodynamics and Plasma Physics & Covariant form of Electromagnetic Equations. 4. Radiation by Moving Charges and Scattering and dispersion.			
Student learning outcome	Student will able to - 1. Demonstrate a rigorous understanding of the fundamentals of classical electrodynamics involved in theories & principles of physics. 2. Sharpen his skill and knowledge and utilize/apply his knowledge in further research and science.			

Unit	Syllabus	Periods
UNIT - I	**Electrostatics:** Electric field, Gauss law, differential form of Gauss law, Curl of electric field and the scalar potential, surface distribution of charges and dipoles and discontinuities in the electric field and potential, Poisson and Laplace equations, Green's theorem, uniqueness of the solution with Dirichlet or Neumann boundary conditions, formal solution of the electrostatics boundary value problem with Green's function, Electrostatics potential energy and energy density, capacitance. **Boundary Value Problems in Electrostatics:** Method of images, point charge in the presence of a grounded conducting sphere, point charges in the presence of a charged insulated conducting sphere,	15

	point charges near a conducting sphere at a fixed potential, conducting sphere in an uniform electric field by method of images, Green function for the sphere, general solution for potential, conducting sphere with Hemispheres at different potential, orthogonal functions and its expansion.	
UNIT - II	**Multipoles, Electrostatics of Macroscopic Media Dielectrics:** Multipole expansion of potential multipole expansion of the energy of a charge distribution in an external field, elementary treatment of electrostatics with permeable media, boundary value problems with dielectrics, molecular polarizability and electric susceptibility, models for molecular polarizability, electrostatic energy in dielectric media. **Magnetostatics:** Differential equation of Magnetostatics and Ampere's law, vector potential and magnetic induction for a circular current loop, magnetic field of a localized current distribution, magnetic moment, force and torque on and energy of a localized current distribution in an external magnetic field, macroscopic equations, boundary conditions on B & H, methods of solving boundary value problems in magnetostatics, uniformly magnetized sphere in an external field, permanent magnetic shielding, spherical shell of permeable material in an uniform field.	15
UNIT - III	**Time Varying Fields, Maxwell's Equations, Conservation Laws:** Energy in a magnetic field, vector and scalar potential, Gauge transformations, Lorentz Gauge, Coulomb Gauge, Green functions for the wave equation, derivation of the equations of macroscopic electromagnetism, Poynting's theorem and conservation of energy and momentum for a system of charged particles and E.M. fields, conservation laws for macroscopic media. **Plane Electromagnetic Waves and Wave Equation:** Plane wave in a nonconducting medium, frequency dispersion characteristics of dielectrics, conductors and plasmas, waves in a conducting or dissipative medium, superposition of waves in one dimension, group velocity, Causality in the connection between D and E, Kramers-Kroning relation.	15
UNIT - IV	**Magneto Hydrodynamics and Plasma Physics:** Introduction and definitions, MHD equations,magnetic diffusion, viscosity and pressure, pinch effect, instabilities in a pinched plasma column, magneto hydrodynamic waves, plasma oscillations, short wavelength limit on plasma oscillations and Debye shielding distance. **Covariant form of Electromagnetic Equations**: Mathematical properties of the space time of special relativity, invariance of electric charge, covariance of electrodynamics, transformation of electromagnetic field.	15

UNIT - V	**Radiation by Moving Charges:** Lienard-Wiechart potentials for a point charge, total power radiated by an accelerated charge, Larmour's formula and its relativistic generalization, angular distribution of radiation emitted by an accelerated charge, radiation emitted by a charge in arbitrary extremely relativistic motion, distribution in frequency and angle of energy radiated by accelerated charges, Thomson scattering and radiation, scattering by quasi free charges. **Scattering and dispersion:**-Introductory considerations, radiative reaction force from conservation of energy, Abraham Lorentz evaluation of the self force, difficulties with Abraham Lorentz model, integral-differential equation of motion including radiation damping, line breadth and level shift of an oscillator, scattering and absorption of radiation by an level shift of an oscillator, scattering and absorption of radiation by an oscillator, energy transfer to harmonically bound charge.	15

References:

1. Classical electrodynamics: J. D. Jackson
2. Classical Electricity and Magnetism: Panofsky &Philips
3. Introduction to Electrodynamics: Griffiths
4. Classical theory of fields: Landau & Lifishtiz
5. Electrodynamics of continuous Media: Landau & Lifishtiz

01/06/23 01.06.23 1/6/23

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School of Basic & Applied Science

Class			M.Sc. (P) Physics
Semester/Year			I Year
Subject			Physics
Paper	English		Paper III - Quantum Mechanics and Atomic & Molecular Physics (MPHYS20Y103)
	fgUnh		
Max. Marks			
Credit	Total Credits		
L	T	P	
4	0	0	4
Course Objective	1. Show an understanding of quantum mechanics in three dimensions and Quantitative details of Atomic & molecular physics. 2. Use the tools, methodologies and conventions of physics to test and communicate ideas and explanations.		
Course Outcome	1. Student will understand – States Amplitudes and Operators; Observable and Description of Quantum System; Hamiltonian Matrix and time evolution. 2. Quantum mechanical states, Transition Between Stationary States and the Co-ordinate Representation. 3. Hydrogen Atom and Interaction with External Fields 4. Symmetries and Angular Momentum & their Eigen values; Systems with Identical Particles. 5. Quantative study of Spectroscopy.		
Student learning outcome	Student will able to – 1. Demonstrate a rigorous understanding of the fundamentals of Quantum Mechanics and atomic & molecular physics, involved in theories & principles of physics. 2. Sharpen his skill and knowledge and utilize/apply his knowledge in further research and science.		

Unit	Syllabus	Periods
UNIT - I	**States Amplitudes and Operators:** States of a quantum mechanical system, Bro and Kat Algebra, representation of quantum mechanical states, properties of quantum mechanical amplitude, operators and change of state of a complete set of basic states, product linear operators, language of quantum mechanics, postulates, essential definition and consequent relations. **Observable and Description of Quantum System:** Process of measurement, expectation values, time dependent of a quantum mechanical amplitude, Observables with no classical analogue, Spin dependence of quantum mechanical amplitude on position,	15

	the wave function, superposition of amplitudes, Identical particles, creation and annihilation operators, simple harmonic oscillator. **Hamiltonian Matrix and time evolution of quantum mechanical states:-**Hermiticity of the Hamiltonian Matrix, Time independent perturbation of an arbitrary system, Simple matrix examples of time independent perturbation, Energy eigen states of two state system, Diagonalizing of energy matrix, Time independent perturbation of a two state system, Perturbative solution: weak field and strong field cases, General description of a two state system, Pauli matrices, Ammonia molecule as an example of two state system, asymmetric harmonic oscillator.	
UNIT - II	**Transition Between Stationary States:** Transition in two state system, Time dependent perturbation-The Golden rule, Phase space, Emission and absorption of radiation, Induced dipole transition and spontaneous emission of radiation, Energy width of a quasi stationary state. **The Co-ordinate Representation:** Compatible observable, quantum conditions and uncertainty relations, co-ordinate representation of operators: position, momentum and angular momentum. time dependence of expectation values, The Schrodinger equation, energy quantization, periodic potential as an example.	15
UNIT - III	**Hydrogen Atom:** Gross structure energy spectrum probability distribution of radial and angular (l =1, 2), Wave functions (no derivation), Effect of spin, relativistic correction to energy levels and fine structure, magnetic dipole interaction and hyperfine structure, the Lamb shift (only a qualitative description). **Interaction with External Fields:** Non degenerate first order stationary perturbation methods, Atom in a weak uniform external electric field and first and second order Stark effect, Calculation of the polarizability of the ground state of H-atom and of an isotropic harmonic oscillator, Degenerate stationary perturbation theory, Linear Stark effect for H-atom levels, Inclusion of spin orbit and weak magnetic field, Zeeman effect, Strong magnetic field and calculation of interaction energy.	15
UNIT - IV	**Symmetries and Angular Momentum:** Symmetry transformation and conservation laws, Invariance under space and time translations and space rotation; Conservation of momentum, energy and angular momentum. Angular momentum operators and their eigen values, Matrix representation of angular momentum operators and their eigen states, Coordinate representation of the orbital angular momentum operators and their eigen states (spherical harmonics), Composition of angular momentum. Clebsch-Gordon coefficient, Tensor operators and Wigner Echart theorem, Commutation relations J_+, J_- and J with reduced spherical tensor operator, Matrix elements of vector operators, Time reversal invariance and vanishing of static electric dipole moment of stationary state.	15

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UNIT - V	**Systems with Identical Particles:** Indistinguishability and exchange symmetry, Many particles wave function and Pauli's exclusion principle, Spectroscopic terms for atoms, The Helium atom, Variational method and its use in the calculation of ground state and excited state energy, Helium atom, Hydrogen molecule, Heitler London methods for H_2 molecule, WKB method for one dimensional problem, Application to bound states (Bohr Sommerfield quantization) and the barrier penetration (Alpha decay problems). **Spectroscopy (Quantitative):** General feature of spectra of one and two electron system, Vibration band spectrum of a molecule, P.Q & R branches, Raman spectra for rotational and irrotational transitions, comparison with infrared spectra, General features of electronic spectra, Frank Condon principle.	15

References:

1. Quantum Mechanics-A Modern Approach : Ashok Das & A.C. Melissions
2. Quantum Mechanics: P.A.M. Dirac
3. Quantum Mechanics (2nd ed.): E. Merzbecker
4. Quantum Mechanics- Non relativistic theory: L.P. Landau &H. M. Lifshitz
5. Quantum Mechanics: Thankapann (New Age International pub.)
6. Quantum Mechanics- Theory & Applications: A. Ghatak & S. Loknathan
7. Atomic Spectra: White
8. Molecular Spectra: Hertzberg
9. Atomic and Molecular Physics: T.A. Littlefield
10. Elementary Atomic Structure: G. R. Woodgate
11. Quantum Physics Atoms, Molecules, Solid & Nuclear Particles: Eistenberge & Resnick.
12. Quantum Mechanics, B H Branson and C. J. Joachain, Pearson Education.

School of Basic & Applied Science

Class		**M.Sc. (P) Physics**
Semester/Year		**I Year**
Subject		**Physics**
Paper	**English**	**Paper IV - Electronics, Numerical Methods and Computer Programming (MPHYS20Y104)**
	हिन्दी	
Max. Marks		
Credit	**Total Credits**	
L T P / **4 0 0**		4
Course Objective		1. To develop an understanding of fundamentals of electronics in order to deepen the understanding of electronic devices that are part of the technologies that surround us. 2. To learn about approximation, error in numerical analysis, interpolation and solution of non-linear equations along with their application using computer programming.
Course Outcome		1. To understand working & functioning of amplifiers and wave shaping circuits their applications. 2. Student will understand the working and applications of logic & Integrated Circuits and Multivibrators. 3. Students will learn how to reach to accuracy by minimizing the errors during experiments and reach to approximation using different methods of interpolation. 4. Students will able to solve non- linear and integration of first order differential equation. 5. Student will able to learn programing in Basic and Fortran Language.
Student learning outcome		Student will able to – 1. Demonstrate a rigorous understanding of the fundamentals of Electronics, Numerical Methods and Computer Programming, involved in theories & principles of physics. 2. Sharpen his skill and knowledge and utilize/apply his knowledge in further research and science.

Unit	Syllabus	Periods
UNIT - I	**Linear Small Signal and Direct Coupled Amplifier:**-R.C. Coupled C.E. Amplifier and its response in different frequency ranges, effect of cascading expression of bandwidth in low and high frequency ranges, emitter follower, tuned amplifier(small signal) single and double tuned amplifiers, Differentials amplifier, common mode rejection ratio, operational amplifier and its basic applications. **Wave Shaping Circuits:** Exponential circuit response, differentiation and integration by R.C. and L.R circuits, clipping or limiting circuit, clamping circuit, general feature of a time base signal, thyratron sweep circuits, circuits to improve linearity, Miller and Boot strap sweep circuits.	15

UNIT - II	**Logic and Integrating Circuits:** Boolean algebra, binary counting, counting to a base other then two, binary counter, conversion of binary counter in a decade counter, Decoder, logic gates : NOT, OR, AND, NAND and their circuits, Micro electronic devices, basic principles of LED & solid state laser. basic concepts about fabrication and characteristics of integrated circuits. **Multivibrators:** Astable, monostable, and bistable multivibrators, frequency of a stable vibrator, frequency control and synchronization, triggering of bistable, Blocking oscillator.	15
UNIT - III	**Errors in Numerical Analysis: -** Computer arithmetic, sources of errors, Round off errors, Errors analysis, Condition and stability, Approximation, functional and errors analysis, The method of Undetermined coefficients. **Interpolation:-** Interpolation, Finite differences, Gauss central difference formula, Newton's formula for interpolation, Lagrange's interpolation formula, Double interpolation, Numerical differentiation, Newton and Starling's formula, Solution of linear systems, Direct and iterative, Eigen value problems.	15
UNIT - IV	**Solution of Non-Linear Equation:** Bisection method, Newton's Method, Modified Newton's method, Method of integration, Newton's method and method of integration for a system of equations, Newton's method for the case of complex roots, Integration of functions: Trapezoidal and Simpson's rules, Gaussian quadrature formula, singular integrals, Double integration.	15
UNIT - V	**Integration of Ordinary Differential Equation:-** Predictor Corrector method, Runga-Kutta methods, Simultaneous and higher order equations, Numerical integration and differentiation of Data, Least squares approximation, computer simulation, Monte Carlo method, Curve fitting. **Introduction to C:** Data type (int, float, double, char, long, long double etc.) operators (Unary.Binary and ternarys), input /output statement (scanf(), printf()), control statements (if, for, while, do while, switch -case-default), Function (type of Function, function definition, function calling, formal arguments, actual arguments, function prototype), Program structure, string (Array, character array), string manipulation functions like strlen(), strcpy(), strcat(), strcmp(), etc.	15

References:

1. Electronics-fundamentals and Applications : Ryder
2. Integrated Electronics : Millman & Halkias
3. Pulse digital and switching Waveforms : Millman & Taub
4. Network-Line and Fields : Ryder
5. Electronics Devices and Circuits : Bapat
6. Programming in Basic : B. Balguruswamy (McGraw Hill-1985)
7. Introductory Methods of Numerical Analysis : S.S. Sastry
8. A first course in Numerical Analysis : A. Ralston & P. Rabinowitz (McGraw Hill-1985)

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School of Basic and Applied Sciences

Class	M.Sc. Physics (Previous)				
Semester/Year	I Year				
Subject	Practical Physics - MPHYS20Y105				
Paper	Paper- I & Paper- II, Practical	L	T	P	Total C.
Max. Marks	50= (30+20)	0	0	4	4

PRACTICALS

1 Useof Michelson's'Interferometerto determine:

i. Wavelength of monochromatic light.

ii. D1forsodium doublet.

iii. Thickness of the given micasheet.

2 Use Faberyparot's interferometerto determine:

i. Wavelength of sodiumlight.

ii. D1forsodium doublet.

3 VerifyFresnel'sLaws.

4 Determinethe wavelength of Neon light taking Hgsourceas a standardsource applyingHartman's formula.

5 UseBebinat's compensator,

i. To analyzeellipticallypolarized light.

ii. To determinethe phasedifferenceintroduced between ordinary&extraordinaryrays.

6 DetermineStefan's constant.

01/06/23 01.06.23 1/6/23

1/6/23

EKLAVYA UNIVERSITY

ज्ञान प्राप्तये लक्ष्य संधानम्

School of Basic and Applied Sciences

Class	M.Sc. Physics (Previous)
Semester/Year	I Year
Subject	Practical Physics - MPHYS20Y106
Paper	Paper- III & Paper- IV, Practical
Max. Marks	50= (30+20)

L	T	P	Total C.
0	0	4	4

PRACTICALS

1 Designa Doublestage R.C. Coupedamplifier and study:

i. Frequencyresponse.

ii. The amplitudecharacteristics.

2 Determinethecapacitance, resistance and inductanceofa coilat radiofrequencyand to study the variations of Zwith frequency

3 Determinethe ,gm & rpofatriodebybridgemethod and studythe variation of thesequantitieswith grid voltage

4 Study theseriesandparallel response circuit:

(i). To plot the frequencyresponse curvecharacteristics ofseries circuit.

(ii). To plotthe frequencyresponse ofparallel tuned circuit.

5 Todesignandstudy thefrequency response ofacathodepower.

6 To studythe waveform characteristics ofastable multivibrator. (i)To design C.R.O. anddetermineits frequencybyvarying C&R.

7 To designand calibrate a Hartley Oscillator.

8 To studyfrequencyresponse ofphasecharacterstics of:

(i) Low pass filter.

(ii) High passfilter.

9 To design&studytheDynatron oscillator.

10 Anyother experiment of equivalent standard can be added.

01/06/23 01.06.23 1/6/23 1/6/23