



# KALIPADA GHOSH TARAI MAHAVIDYALAYA

ESTD: 1988

PO: BAGDOGRA, DIST: DARJEELING, PIN 734014

E-mail: prinkgtm@gmail.com

## DEPARTMENT OF PHYSICS

### Curriculum Plan

#### CBCS (PROGRAM/GE) SYLLABUS (INTRODUCED IN 2018)

#### SEMESTER-I

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
MECHANICS	DSC 1A/ GE T1	Vectors	4	Dr. Koyel Bhattacharya	1. Vector Analysis by M. R. Spiegel 2. Mathematical Physics by A. B. Gupta 3. Classical Mechanics and Properties of Matter by A. B. Gupta 4. A Treatise on General Properties of Matter by Sengupta and Chatterjee
		Ordinary Differential Equations	6	Dr. Koyel Bhattacharya	
		Laws of Motion	10	Titas Banerjee	
		Momentum and Energy	6	Titas Banerjee	
		Rotational Motion	5	Titas Banerjee	
		Gravitation	8	Titas Banerjee	
		Oscillations	6	Dr. Koyel Bhattacharya	
		Elasticity	8	Dr. Koyel Bhattacharya	
		Special Theory of Relativity	7	Dr. Koyel Bhattacharya	
		Mechanics Lab	60	Dr. Koyel Bhattacharya & Titas Banerjee	



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## SEMESTER-II

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
<b>ELECTRICITY &amp; MAGNETISM</b>	<b>DSC 2A/ GE T2</b>	Vector Analysis	12	Dr. Koyel Bhattacharya	1. Fundamentals of Electricity and Magnetism by B. Ghosh
		Electrostatics	22	Titas Banerjee	
		Magnetism	10	Dr. Koyel Bhattacharya	
		Electromagnetic Induction	6	Dr. Koyel Bhattacharya	2. Electrodynamics by Griffiths
		Maxwell's equations and Electromagnetic wave propagation	10	Dr. Koyel Bhattacharya	3. Electricity and Magnetism by Chattopadhyaya and Rakshit
		Electricity and Magnetism Lab	60	Dr. Koyel Bhattacharya & Titas Banerjee	4. Electricity and Magnetism by D. C. Tayal

## SEMESTER-III

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
<b>THERMAL PHYSICS &amp; STATISTICAL MECHANICS</b>	<b>DSC 3A/ GE T3</b>	Laws of Thermodynamics: Thermodynamic Description of system	22	Dr. Koyel Bhattacharya	1. Thermal Physics by A. B. Gupta and H. P. Roy
		Thermodynamic Potentials	10	Dr. Koyel Bhattacharya	2. Thermal Physics by S. Garg, R. Bansal and C. Ghosh
		Kinetic Theory of Gases	10	Titas Banerjee	
		Theory of Radiation	6	Titas Banerjee	3. Heat and Thermodynamics by M.W.Zemasky and R. Dittman
		Statistical Mechanics	12	Titas Banerjee	
		Thermal Physics and Statistical Mechanics Lab	60	Dr. Koyel Bhattacharya & Titas Banerjee	



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## SEMESTER-IV

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
WAVES AND OPTICS	DSC 4A/ GE T4	Superposition of Two Collinear Harmonic oscillations	4	Dr. Koyel Bhattacharya	1. Principles of Acoustics by B. Ghosh 2. Vibrations, Waves and Acoustics by Chattopadhyaya and Rakshit 3. A Text Book on Light by Majumdar and Ghosh 4. Modern Optics by A. B. Gupta
		Superposition of Two Perpendicular Harmonic Oscillations	2	Dr. Koyel Bhattacharya	
		Waves Motion-General	7	Dr. Koyel Bhattacharya	
		Fluids	6	Dr. Koyel Bhattacharya	
		Sound	6	Dr. Koyel Bhattacharya	
		Wave Optics	3	Titas Banerjee	
		Interference	10	Titas Banerjee	
		Michelson's Interferometer	3	Titas Banerjee	
		Diffraction	14	Titas Banerjee	
		Polarization	5	Titas Banerjee	
Waves and Optics Lab	60	Dr. Koyel Bhattacharya & Titas Banerjee			



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## SEMESTER-V

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
ELEMENTS OF MODERN PHYSICS	DSE 1	Quantum Mechanics	40	Dr. Koyel Bhattacharya	1. Modern Physics by R. Murugesan
		Atomic Physics	4	Dr. Koyel Bhattacharya	2. Modern Atomic and Nuclear Physics by A. B. Gupta
		Nuclear Physics: Introduction	6	Dr. Koyel Bhattacharya	3. Physics of Nucleus by Gupta and Roy
		Particle Accelerator	4	Titas Banerjee	4. Quantum Mechanics, Statistical Mechanics and Solid State Physics by Chattopadhyaya and Rakshit
		Detectors	4	Titas Banerjee	
		Radioactivity	4	Titas Banerjee	
		LASER	3	Dr. Koyel Bhattacharya	5. Fundamentals of Quantum Mechanics, Statistical Mechanics and Solid State Physics by S. P. Kuila

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
ELECTRICAL CIRCUITS AND NETWORK SKILLS	SEC 1	Basic Electricity Principles	3	Titas Banerjee	1. A text book in Electrical Technology by B. L. Theraja
		Understanding Electrical Circuits	4	Titas Banerjee	2. Performance and design of AC machines - M G Say
		Electrical Drawing and Symbols	4	Titas Banerjee	3. A Course in Electrical & Electronic Measurements & Instrumentation by A. K. Sawhney
		Generators and Transformers	3	Titas Banerjee	
		Electric Motors	4	Titas Banerjee	
		Solid-State Devices	3	Titas Banerjee	
		Electrical Protection	4	Titas Banerjee	4. Basic Electrical Engineering by D. C. Kulshreshtha
Electrical Wiring	5	Titas Banerjee			



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## SEMESTER-VI

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
<b>SOLID STATE PHYSICS</b>	<b>DSE 2</b>	Crystal Structure	12	Titas Banerjee	1. Elementary Solid State Physics, 1/e by M. Ali Omar  2. Quantum Mechanics, Statistical Mechanics and Solid State Physics by Chattopadhyaya and Rakshit  3. Solid State Physics and Electronics by Puri and Babbar  4. Solid State Physics by S. O. Pillai
		Elementary Lattice Dynamics	10	Titas Banerjee	
		Magnetic Properties of Matter	12	Titas Banerjee	
		Dielectric Properties of Materials	10	Titas Banerjee	
		Elementary band theory	10	Dr. Koyel Bhattacharya	
		Superconductivity	6	Titas Banerjee	
		Solid State Physics Lab	60	Titas Banerjee	

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
<b>RENEWABLE ENERGY AND ENERGY HARVESTING</b>	<b>SEC 2</b>	Fossil fuels and Alternate Sources of energy	3	Dr. Koyel Bhattachary	1. Non-conventional energy sources by G.D Rai  2. Solar energy by M P Agarwal  5. Non-Conventional Energy Resources, 3 <sup>rd</sup> Edition by B. H. Khan  6. Renewable Energy Sources and Emerging Technologies, 2 <sup>nd</sup> Edition by Kothari, Singal, Ranjan
		Solar energy	6	Dr. Koyel Bhattachary	
		Wind Energy harvesting	3	Dr. Koyel Bhattachary	
		Ocean Energy	5	Dr. Koyel Bhattachary	
		Geothermal Energy	2	Dr. Koyel Bhattachary	
		Hydro Energy	2	Dr. Koyel Bhattachary	
		Piezoelectric Energy harvesting	4	Dr. Koyel Bhattachary	
		Electromagnetic Energy Harvesting	5	Dr. Koyel Bhattachary	



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## FYUGP SYLLABUS (INTRODUCED IN 2023)

### PHYSICS (MAJOR)

#### SEMESTER-I

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
MATHEMATICAL PHYSICS-I	UPHYMAJ 11001	Vector Algebra	10	Dr. Koyel Bhattacharya	1. Vector Analysis by M. R. Spiegel
		Vector Calculus	12	Dr. Koyel Bhattacharya	
		Orthogonal Curvilinear Coordinates	8	Dr. Koyel Bhattacharya	2. Mathematical Physics by A. B. Gupta
		Differential Equations	15	Dr. Koyel Bhattacharya	3. A Treatise on General Properties of Matter by Sengupta and Chatterjee
		Mathematical Physics-I Lab	30	Dr. Koyel Bhattacharya	4. Mathematical Physics by Goswami, 5. Engineering Mathematics by S. Pal and S. C. Bhunia 6. Differential Equations by George F. Simmons

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
BASIC ELECTRICAL CIRCUITS AND MEASUREMENTS	UPHYSEC 11001	Basic Electricity Principles	4	Titas Banerjee	1. A text book in Electrical Technology by B. L. Theraja
		Understanding Electrical Circuits	6	Titas Banerjee	2. Performance and design of AC machines - M G Say
		Generators and Transformers	5	Titas Banerjee	
		Solid-State Devices	5	Titas Banerjee	3. A Course in Electrical & Electronic Measurements & Instrumentation by A. K. Sawhney
		Electrical Protection	5	Titas Banerjee	
		Electrical Wiring	5	Titas Banerjee	4. Basic Electrical Engineering by D. C. Kulshreshtha



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## PHYSICS (MAJOR) SEMESTER-II

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
MECHANICS-I	UPHYMAJ 12002	Fundamentals of Dynamics	9	Titas Banerjee	1. Classical Mechanics and Properties of Matter by A. B. Gupta
		Rotational dynamics	10	Titas Banerjee	2. A Treatise on General Properties of Matter by Sengupta and Chatterjee
		Elasticity	6	Titas Banerjee	3. Physics by Resnick, Halliday and Walker 8/e.
		Gravitation and Central Force Motion	12	Titas Banerjee	4. Feynman Lectures, Vol. I, R. P. Feynman, R. B. Leighton, M. Sands
		Non-Inertial Systems	8	Dr. Koyel Bhattacharya	5. Mechanics by D. S. Mathur
		Mechanics-I Lab	30	Dr. Koyel Bhattacharya & Titas Banerjee	6. Theoretical Mechanics by M. R. Spiegel

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
RENEWABLE ENERGY AND ENERGY HARVESTING	UPHYSEC 12002	Fossil fuels and Alternative Sources of energy	5	Dr. Koyel Bhattachary	1. Non-conventional energy sources by G.D Rai
		Solar energy	6	Dr. Koyel Bhattachary	2. Solar energy by M P Agarwal
		Wind Energy	7	Dr. Koyel Bhattachary	3. Non-Conventional Energy Resources, 3 <sup>rd</sup> Edition by B. H. Khan
		Hydro Energy	5	Dr. Koyel Bhattachary	5. Renewable Energy Sources and Emerging Technologies, 2 <sup>nd</sup> Edition by Kothari, Singal, Ranjan
		Geothermal Energy	4	Dr. Koyel Bhattachary	
		Energy budget	3	Dr. Koyel Bhattachary	
		Tutorial/ Project / Field work	30	Dr. Koyel Bhattachary	



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## PHYSICS (MINOR)

### SEMESTER-I/II

COURSE/PAPER	COURSE CODE	NAME OF THE UNIT	NO. OF LECTURES REQUIRED	NAME OF THE ASSIGNED TEACHER	RECOMMENDED READING
MECHANICS	UPHYMIN 10001/UPHYMIN 10002	Vectors	5	Dr. Koyel Bhattacharya	1. Vector Analysis by M. R. Spiegel
		Ordinary Differential Equations	5	Dr. Koyel Bhattacharya	2. Mathematical Physics by A. B. Gupta
		Laws of Motion	8	Titas Banerjee	3. Classical Mechanics and Properties of Matter by A. B. Gupta
		Momentum and Energy	5	Titas Banerjee	4. A Treatise on General Properties of Matter by Sengupta and Chatterjee
		Rotational Motion	7	Titas Banerjee	
		Oscillations	9	Dr. Koyel Bhattacharya	
		Elasticity	6	Titas Banerjee	
Mechanics Lab	30	Dr. Koyel Bhattacharya & Titas Banerjee	5. Physics – Resnick, Halliday & Walker 9/e 6. Engineering Mechanics, Basudeb Bhattacharya		

(Signature of Head of the Department)  
Department of Physics