Documents of Effective Curriculum Planning and Continuous Assessment

Academic Calendar

Academic Calender 2017-18

VIJAYGARH JYOTISH RAY COLLEGE

ACADEMIC CALENDER 2017-2018

July 2017

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August 2017

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September 2017

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October 2017

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November 2017

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December 2017

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January 2018

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February 2018

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March 2018

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April 2018

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May 2018

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June 2018

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HOLIDAYS (17-18)

2017

- 04 Jul: Rathajatra
- 14 Aug: Janmashthami
- 15 Aug: Independence Day
- 2 Sept: Id uz Zuha
- 17 Sept: Bishwakama puja
- 19 Sept: Mahalaya
- 27 Sept-30 Sept:Durga Puja
- 17 Oct: Diwali
- 04 Nov: GuruNanak's Birthday
- 10 Nov:Fateh-Dohaz-Daham
- 04 Nov: Guru Nanak Purnima
- 02 Dec: Fateha Dohaz Dahum
- 25 Dec: Christmas Day

2018

- 12 Jan: Birth Day of Swamiji
- 22 JAN: Saraswati Puja
- 23 Jan: Birth Day of Netaji
- 24 Jan: CU Foundation Day
- 25 Jan: Maghotsav
- 26 Jan: Republic Day
- 14 Feb: Shivratri
- 01-02 Mar: Dol & Holi
- 10 Apr: Good Friday
- 14 Apr: Birth Day of Dr. B. R. Ambedkar
- 15 April:Bengali New Year's Day
- 01 May: May Day
- 07 May: Rabindra Jayanti
- 29th June: Sir Asutosh Day
- 30th June: Hul Diwas

July 2017	August 2017	September 2017	October2017	November2017	December 2017
1st July- July: CU Exam Starts 13th July: IQAC meeting 25th July: UG Class start	3rd Aug: Quiz &Debate 15th Aug:IndependenceDay 19th Aug:Photography Day	5th Sept: Teachers' Day		26th Nov: Constitution Day Orientation 1st Sem C.U.	1st Dec: World AIDS Day 7th Dec: IQAC meeting
January 2018	**February 2018**	**March 2018**	**April 2018**	**May 2018**	**June 2018**
12th Jan: National Youth Day 23rd Jan: Netaji's Birth Ann; NCC 29th Jan: News Paper Day 30th Jan: IQAC meeting	11th Feb: International Day of Women and Girls in Science 21st	02nd March: IQAC Meeting 8th March: Women's Day	7th April: World Health Day 12th April: IQAC Meeting 14th April: Ambedkar Jayanti	2nd May: Celebration of SatyajitRay Birth Centenary Year 9th May: Rabindra Jayanti IQAC Meeting	5th June: World Env Day; NSS 21st June: Yoga Day

Rajyasri Mukherjee

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Academic Calender 2018-19

VIJAYGARH JYOTISH RAY COLLEGE

(8/2, BEJOYGARH, KOLKATA-700032)

ACADEMIC CALENDER 2018-19

July 2018

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August 2018

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September 2018

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October 2018

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November 2018

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December 2018

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January 2019

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February 2019

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March 2019

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April 2019

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May 2019

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June 2019

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HOLIDAYS (18-19)

2018

04 Jul: Rathajatra
15 Aug: Independence Day
22 Aug: Id-Uz-Zoha
02 Sept: Janmashthami
18 Sept: Bishwakama puja
21 Sept: Muharram
24 Sept: Mahalaya
02 Oct: Gandhi Jayanti
15 Oct-19 Oct: Durga Puja
07 Nov: Diwali
14 Nov: Jagadhatri puja
21 Nov:Fateh-Dohaz-Daham
23 Nov: Guru Nanak Purnima
25 Dec: Christmas Day

2019

12 Jan: Birth Day of Swamiji
23 Jan: Birth Day of Netaji
24 Jan: CU Foundation Day
26 Jan: Republic Day
10 Feb: Saraswati Puja
04 Mar: Shivratri
21-22 Mar: Dol & Holi
30 Mar: Ramnabami
14th Apr: Birth Day of Dr. B. R. Ambedkar &Bengali New Year's Day
19 Apr: Good Friday
20 Apr: Shab-e-barat
01 May: May Day
09 May: Rabindra Jayanti
29th June: Sir Asutosh Day
30th June: Hul Diwas

July 2018 16th July: National Doctor's Day 16th July: IQAC Meeting	**August 2018** 3rd Aug: Quiz & Debate 15th Aug: Independence Day 19th Aug: Photography Day	**September 2018** 5th Sept: Teachers' Day	**October2018**	**November2018** 15th Nov: IQAC Meeting	**December 2018** 1st Dec: World AIDS Day
January 2019 12th Jan: National Science Day 29th Jan: News Paper Day	**February 2019** 11th Feb: International Day ofWomen and Girls in Science 15thFeb: IQAC Meeting	**March 2019** 8th March: Women's Day 28th March: IQAC Meeting	**April 2019** 7th April: World Health Day 12th April: IQAC Meeting 14th April: Ambedkar Jayanti	**May 2019** 2nd May: Celebration of SatyajitRay Birth Centenary Year 9th May: Rabindra Jayanti 15th May:IQAC Meeting	**June 2019** 5th June: World Env Day; NSS 21st June: Yoga Day

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Academic Calender 2019-20

VIJAYGARH JYOTISH RAY COLLEGE

ACADEMIC CALENDER 2019-2020

July 2019

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August 2019

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September 2019

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October 2019

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November 2019

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December 2019

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January 2020

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February 2020

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March 2020

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April 2020

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May 2020

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June 2020

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HOLIDAYS (19-20)

2019

- 04 Jul: Rathajatra
- 12 Aug: Id uz Zuha
- 15 Aug: Independence Day
- 24 Aug: Janmashthami
- 17 Sept: Bishwakama puja
- 28 Sept: Mahalaya
- 04 Oct-08 Oct:Durga Puja
- 27 Oct: Diwali
- 06 Nov: Jagadhatri puja
- 12 Nov: GuruNanak's Birthday
- 02 Dec: Fateha Dohaz Dahum
- 25 Dec: Christmas Day

2020

- 12 Jan: Birth Day of Swamiji
- 23 Jan: Birth Day of Netaji
- 24 Jan: CU Foundation Day
- 25 Jan: Maghotsav
- 26 Jan: Republic Day
- 29 Jan: Saraswati Puja
- 21 Feb: Shivratri
- 09-10 Mar: Dol & Holi
- 10 Apr: Good Friday
- 14 Apr: Birth Day of Dr. B. R. Ambedkar
- 15 April:Bengali New Year's Day
- 01 May: May Day
- 08 May: Rabindra Jayanti
- 29th June: Sir Asutosh Day
- 30th June: Hul Diwas

July 2019	August 2019	September 2019	October 2019	November 2019	December 2019
16th July: National Doctor's Day	15th Aug: Independence Day 19th Aug: Photography Day	5th Sept: Teachers' Day 30th Sept: IQAC Meeting		11th Nov: IQAC Meeting	1st Dec: World AIDS Day
January 2020	**February 2020**	**March 2020**	**April 2020**	**May 2020**	**June 2020**
12th Jan: National Science Day 18th Jan: IQAC Meeting 29th Jan: News Paper Day	11th Feb: International Day of Women and Girls in Science	8th March: Women's Day	7th April: World Health Day 14th April: Ambedkar Jayanti	2nd May: Celebration of SatyajitRay Birth Centenary Year 9th May: Rabindra Jayanti 15th May: IQACMeeting	5th June: World Env Day; NSS 21st June: Yoga Day

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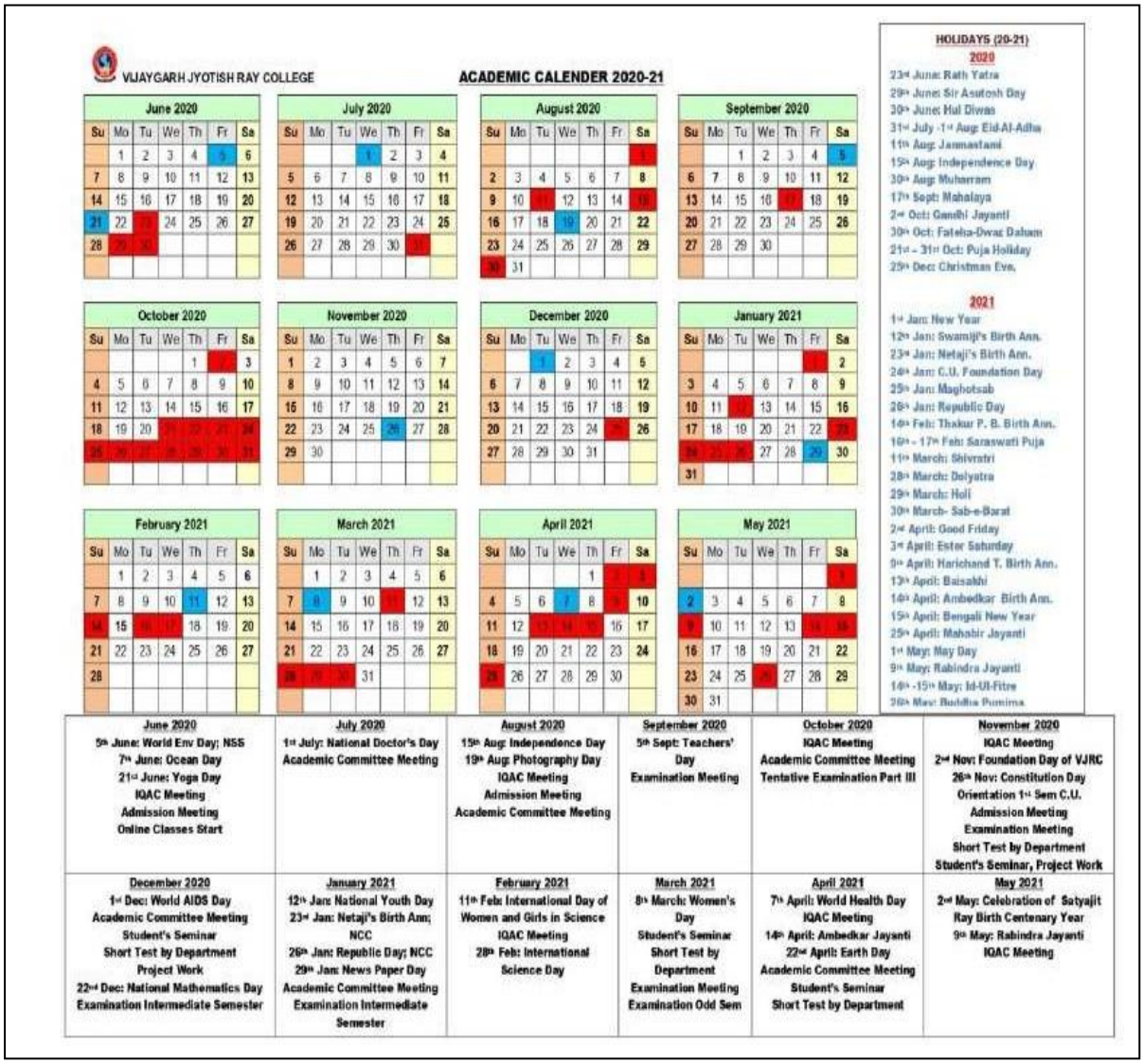
Academic Calender 2020-21



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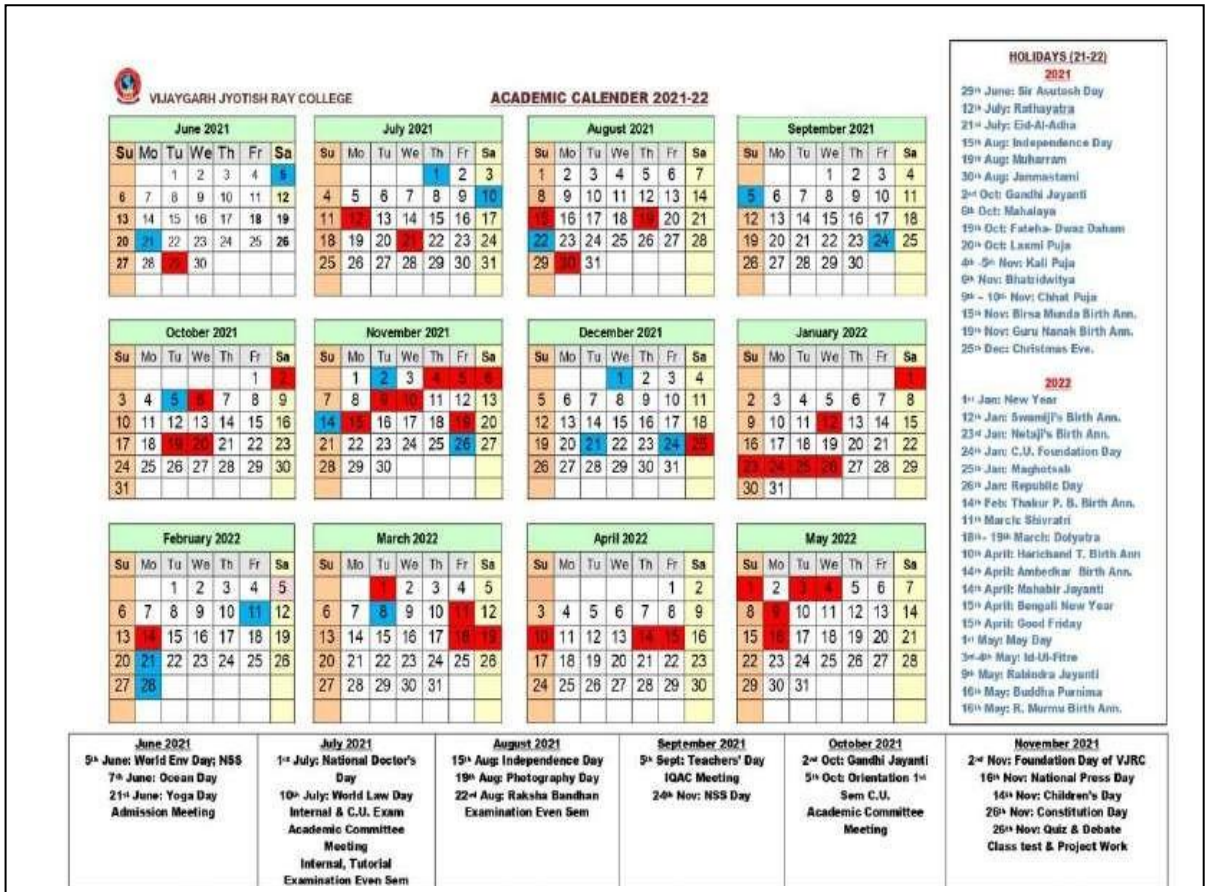
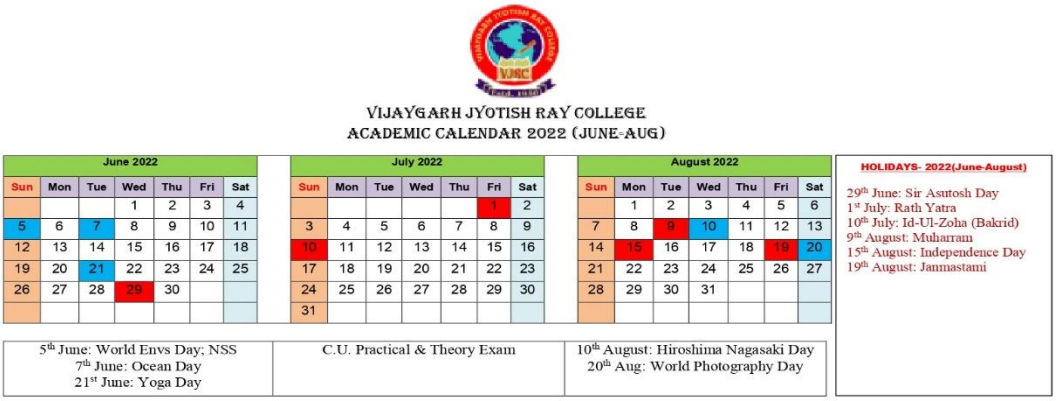
Academic Calender 2021-22





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Academic Plan & Learning Module

LEARNING MODULE FOR BSC HONOURS

SUBJECT- PHYSICS

Semester - 1: Mathematical Physics - I

Mathematical Physics - I (Theory)

Paper: PHS-A-CC-1-1-TH Credits: 4

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Calculus	15	To study Physics certain mathematical tools are required. This section first basically recapitulates limits, continuity, average and instantaneous quantities, Differentiation, plotting functions, Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves Taylor and binomial series. Then the focus is put on solving first and second order differential equations. Then, differentiation and integration involving functions of more than one variable are discussed.	Chalk and Talk, Smart board and computer programming	Discussed topics will be useful in all branches of Physics.
Vector Algebra and Vector Calculus		Several quantities in physics are vectors. Algebra of vectors is discussed. Transformation of vectors from one coordinate to another coordinate is discussed. Concept of gradient, divergence and curl of vector fields are discussed. Idea of line, surface and volume integration of vectors is introduced. Gauss' divergence theorem, Stokes' theorem and Green's theorem and their applications in simple problems are discussed.	Chalk and Talk, Smart board	Students learn algebra, differentiation and calculus of vectors and various theorems relating vector calculus which will be useful in almost all branches of Physics
Matrices	12	In different areas of physics like mechanics, modern ray optics and especially in quantum mechanics we often encounter matrices. Its an useful language to describe a number of variables related by linear but coupled	Chalk and Talk, Smart board Computer programming	Students learn different about different types of matrices and their algebra which will be useful in different areas of

		equations. Various kinds of matrices and their properties are discussed. Eigen value and eigen vectors of matrices are evaluated.		physics.

Mathematical Physics - I **(**Practical**)**

Paper: PHS-A-CC-1-1-P Credits: 2

Topic	**No. of Classes required**	**Objective of the topic**	**Strategy of teaching implemented**	**Outcome**
Introduction to plotting graphs with Gnuplot	8	Plotting functions, data pairs, curve-fitting, etc., using a graph plotting software like Gnuplot are learnt.	Lectures and Practical	Graphs form an integral part of our language of description in almost all branches of Physics. To understand the nature of a function or to extract the values of certain parameters by fitting a set of data to a functional form often becomes necessary. Here we learn the use of some software meant for such purposes.
Introduction to programming in python	6	The variables and data types, commands, syntaxes, etc., of python language are explained.	Lectures and Practical	The basic rules of python language are learned as a background for writing specific programs.
Problems and Applications : Root finding of a single variable i) Bisection method ii) Newton-Raphson Method	2 + 2	Two techniques are learnt for solving an algebraic/transcendental equation with a single variable	Lectures and Practical	Equations form the very basic language of Physics. However, very often, these equations cannot be solved easily/analytically. So numerical techniques become very important.
Sorting of Lists :	2 + 2	Two techniques are learnt to	Lectures and	The sorting programs

i) Bubble sort ii) Selection sort		sort a unarranged list	Practical	have commercial applications. They also become necessary as intermediate steps of a larger program.
ODE in one and two dimensions, using Euler Algorithm	2 + 2	One learns how to solve a 1-dimensional and a 2-dimensional, ordinary differential eqn.	Lectures and Practical	Most of the laws of Physics come in the form of differential equations. So techniques of solving them are of utmost importance. Finds application in almostall branches of physics.
Matrix operation using list of lists	4	Programs for matrix addition, subtraction, multiplication and transposition are learnt.	Lectures and Practical	Matrices appear in various branches of Physics, like Mechanics, Optics, etc. Hence handling them is important to learn.

Semester - 1: Mechanics

Mechanics (Theory)

Paper: PHS-A-CC-1-2-TH Credits: 4

Topic	**No. of Classes required**	**Objective of the topic**	**Methods of teaching implemented**	**Outcome**
Fundamentals of Dynamics	8	In this chapter Newton's laws of motion of particles are discussed in details. Then the equation of motion is solved for simple force fields in one, two and three dimensions in Cartesian, polar and spherical polar coordinates systems to find the trajectory of the particle. Based on the ideas obtained so far motion of system of particles is discussed and the idea of centre of mass is introduced.	Chalk and Talk, Smart board	These are the basics of Classical mechanics and will be useful in many branches of Physics.
Work and Energy	4	In this chapter work done on or by a particle or system of particles moving in a force field is discussed and hence the total mechanical energy is calculated.	Chalk and Talk, Smart board	This forms the very basics of Classical Mechanics.

		Based on this, the conservation principle of energy is discussed and classification of forces based on this is discussed.		
Gravitation and Central Force Motion	8	Central force is resulted by the mutual interaction of two or more bodies. First, it is shown that a two body central force can be reduced to one body problem. Then the equation of motion is set up in plane polar coordinates and the equation of the trajectory is determined. Then, motion is discussed for inverse-square force field. Kepler's laws of planetory motion are discussed. Then, Newton's law of Gravitation is discussed. Then, Gravitational potential and field are calculated for spherical masses.	Chalk and Talk, Smart board	Motion of a particle in central force field is very important as this is the type of motion performed by planets around the sun, by satellites around the earth, by two charged particles around each other and so on.
Non-Inertial Systems	6	Galilean transformation of two coordinates system and Galilean invariance of Newton's laws of motion are discussed. Then for non-inertial frames fictitious or pseudo force is discussed. Then equation of motion in uniformly accelerating and uniformly rotating frames of reference is discussed. Then Coriolis force and centrifugal force are discussed.	Chalk and Talk, Smart board	This particular topic is helpful when we study motion in a non-inertial frame of reference.
Rotational Dynamics	10	Idea of rigid body and its translation and rotational motion are introduced. For rotational motion, the idea of moment of inertia and energy and momentum are introduced. Parallel and perpendicular axes theorems regarding moment of inertia are established. For rigid body motion the idea of ellipsoid of inertia, inertia tensor is introduced. For simple symmetric cases, concept of principal axes is discussed.	Chalk and Talk, Smart board	Students learn about various aspect of rotational motion of rigid body.
Fluid Motion	6	The basic laws and equations governing the motion of a fluid is studied	Chalk and Talk, Smart board	We can divide the study of motion in three categories :

				the motion of a particle, a rigid body and a deformable body or a fluid. In this section, we discuss the motion of a fluid.

Mechanics (Practical)

Paper: PHS-A-CC-1-2-P Credits: 2

Topic	**No. of Classes required**	**Objective of the topic**	**Strategy of teaching implemented**	**Outcome**
To determine the Moment of Inertia of a metallic cylinder / rectangular bar about an axis passing through the C.G. and to determine the Modulus of Rigidity of the suspension wire	4	Using torsional oscillation to find the moment of inertial of a body	Practical	A simple experimental method to find the moment of inertia of a body
To determine the Moment of Inertia of a Flywheel	4	Using rotational motion of flywheel and axle with help of unwinding of thread with a attached mass to find the moment of inertia of the flywheel.	Practical	A simple experimental method to find the moment of inertia of a flywheel.
To determine the elastic constants of a material by Searle's method	4	By studying oscillations of two hanging rods which are attached to one another by a flexible thick wire to find the elastic constants of the material of the wire	Practical	A simple experimental method to find the elastic constants
To determine the value of g using Bar Pendulum	4	To find the acceleration due to gravity by studying the oscillation of compound pendulum	Practical	A simple yet elegant experiment to find the value of ‘g’
To determine the height of a building using sextant	4	By measuring the angle of elevation to find the elevation of an object	Practical	A simple experiment to find the elevation of an object
Determination of Young's modulus of the material of a	4	To find Young’s modulus of the material of a beam by measuring the depression of the beam for a	Practical	A simple experimental method to find the

beam by the method of flexure		particular load.		Young's modulus

LEARNING MODULE FOR BSC GENERAL

SUBJECT- PHYSICS

Semester - 1: Mechanics

Mechanics (Theory)

Paper: PHS-G-CC-1-1-TH Credits: 4

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Mathematical Methods	13	Several quantities in physics are vectors. Algebra of vectors is discussed. Concept of gradient, divergence and curl of vector fields are discussed. Idea of line, surface and volume integration of vectors is introduced. Gauss' divergence theorem, Stokes' theorem and Green's theorem and their applications in simple problems are discussed. First order homogeneous and 2^{nd} order homogeneous and inhomogeneous differential equations are discussed.	Chalk and Talk	Students learn algebra, differentiation and calculus of vectors and various theorems relating vector calculus which will be useful in almost all branches of Physics. The laws of Physics often comes in the form of differential equations. Hence techniques of solving them are of great importance.
Introduction to Newtonian Mechanics		Newton's laws of motion and the concept of frame of reference are introduced. Dynamics of a single particle and a system of particles are discussed. The concept of potential energy is the conservation of energy principle are introduced. The idea of centre of mass is given.	Chalk and Talk	These are the basics of Classical mechanics and will be useful in many branches of Physics.
Rotational motion	4	Rotational motion of a rigid body is discussed. The concept of angular velocity, angular	Chalk and Talk	Like linear motion, rotational motion also occur in nature.

		momentum, moment of inertia and torque are introduced.		One learns to study them using analogies with linear motion.
Central force and Gravitation	6	The concept of Central force is introduced. Kepler's laws of planetary motion are mentioned. Newton's law of Gravitation and the motion of satellites under the action of gravity is discussed. The basic technique of GPS is taught.	Chalk and Talk	Motion of a particle in central force field is very important as this is the type of motion performed by planets around the sun, by satellites around the earth, by two charged particles around each other and so on.
Oscillations	5	Simple harmonic motion is defined and its various properties are studied. Then motion of damped harmonic oscillator and forced oscillator are discussed.	Chalk and Talk	A very basic toy model with a huge field of application like Acoustics, Solid State Physics, Optics, Quantum Mech., Nuclear models and so on.
Elasticity	6	First, the relation amongst the various elastic constants is established. Then, twisting of a cylinder under twisting couple is discussed. Then bending of a beam is discussed. Then strain energy is calculated for different kind of stresses.	Chalk and Talk	This will find application in condensed matter of physics and material science.
Surface Tension	4	Surface tension and surface energy are defined and compared. The excess pressure within a soap bubble and the capillary action are discussed as effects of surface tension. Variation of surface tension with temperature is also discussed.	Chalk and Talk	Surface tension is the root cause of many natural phenomena, e.g., capillary rise. One learns how this force works.

Mechanics (Practical)

PHS-G-CC-1-1-P Credits: 2

Topic	**No. of Classes required**	**Objective of the topic**	**Strategy of teaching implemented**	**Outcome**

Determination of Moment of inertia of cylinder/bar about axis by measuring the time period, of the cradle and with body of known moment of Inertia	4	Using torsional oscillation to find the moment of inertial of a body	Practical	A simple experimental method to find the moment of inertia of a body
Determination of Y modulus of a metal bar of rectangular cross section by the method of flexure.	4	To find Young's modulus of the material of a beam by measuring the depression of the beam for a particular load.	Practical	A simple experimental method to find the Young's modulus
Determination of rigidity modulus of wire by measuring the time period of torsional oscillation of a metal cylinder attached to it	6	To get familiar with magnetometer and measure the horizontal component of Earth's magnetic field	Practical	
Determination of Moment of Inertia of a flywheel	4	Using rotational motion of flywheel and axle with help of unwinding of thread with a attached mass to find the moment of inertia of the flywheel.	Practical	A simple experimental method to find the moment of inertia of a flywheel.
Determination gravitational acceleration, g using bar pendulum	4	To find the acceleration due to gravity by studying the oscillation of compound pendulum	Practical	A simple yet elegant experiment to find the value of 'g'

LEARNING MODULE FOR B.Sc. HONOURS

SUBJECT- PHYSICS

Semester - 2: Electricity and Magnetism

Electricity and Magnetism (Theory)

Paper: PHS-A-CC-2-3-TH Credits: 4

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Delta Function and its Properties	2	The Delta function of Dirac is introduced. Its definition and the properties of Delta function and its derivatives are studied.	Chalk and Talk	The topic finds immediate application in Electrostatics and later on, in various branches of Physics
Electrostatic Field	12	Basic idea of electrostatic field, potential of any charge distribution is discussed. Then various aspects of electrostatic field and potential are discussed followed by determination of electrostatic field and potential of few symmetric charge distribution by employing various method like Gauss's theorem, method of image charge etc.	Chalk and Talk	Discussed topics find application in condensed matter physics, nuclear physics, and modern physics and so on.
Dielectric properties of matter	6	Idea of electric dipole is introduced followed by discussion of dielectric properties of matter.	Chalk and Talk	Discussed topic finds huge application in condensed matter physics.
Method of Images	4	It's a special technique of finding the electric potential and field due to one or more point charges in some special cases.	Chalk and Talk	It is demonstrated how to find the solution in cases of point charge(s), placed near conducting planes and spheres
Electrostatic Energy	2	The expression for energy of a charge distribution and that of the field energy of an electric field is derived.	Chalk and Talk	Demonstrates how to calculate the energy of a charge distribution and also introduces the concept of field energy, which will

				later be useful in Field Theories.
The Magnetostatic Field	10	First the idea of magnetic force is introduced followed by the calculation of magnetic field of few steady current distributions. Then vector aspects of magnetic field induction are discussed followed by introduction of magnetic vector potential.	Chalk and Talk	Underlying ideas form the basic building blocks of classical and quantum field theory.
Magnetic properties of matter	6	First the idea of magnetic dipole is introduced and then field and potential of magnetic dipole is calculated. Then magnetic properties of matter are discussed.	Chalk and Talk	These topics find application in condensed matter physics and material science.
Electromagnetic induction	6	Laws of electromagnetic induction are discussed. Then ideas and calculations of self and mutual induction are discussed. Then Maxwell's equations are discussed.	Chalk and Talk	The discussed ideas form the basic of electromagnetic theory.
Electrical circuits	5	Kirchoff's law regarding electric circuit is discussed. Then response of various circuits containing resistors, inductors and capacitors on application of alternating voltage is discussed.	Chalk and Talk	This particular topic finds application in elctronics and instrumental science.

Electricity and Magnetism (Practical)

Paper: PHS-A-CC-2-3-P Credits: 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
To determine an unknown Low Resistance using Potentiometer	4	To get familiar with Potentiometer and use it to measure an unknown low resistance	Practical	To understand the basic principles of measuring small potential differences
To determine an unknown Low Resistance using Carey Foster's Bridge	4	To get familiar with Carey-Forster's bridge and use it to measure an unknown low resistance	Practical	To understand the basic principles of low resistance measurement
To study response curve of a Series	4	To study response of a circuit containing resistor, inductor and	Practical	To understand behavior of series

LCR circuit and determine its (a)Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q and (d) Band width		capacitor under sinusoidal AC voltage		LCR circuit under sinusoidal AC
To study the characteristics of a series RC Circuit	4	To study response of a circuit containing resistor and capacitor	Practical	To understand behavior of a series RC circuit
To study the mutual induction between two coils	4	Two measure the mutual induction between two coils, varying the angle between their planes.	Practical	Familiarizes the concept of mutual inductance and the use of ballistic galvanometer.
Determination of horizontal component of the earth's magnetic field	4	To measure the horizontal component of earth's magnetic field experimentally	Practical	Learning to handle magnetometers and develop some idea on terrestrial magnetism.

Semester - 2: Waves and Optics

Waves and Optics (Theory)

Paper: PHS-A-CC-2-4-TH Credits: 4

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Oscillations	8	Studies various aspects of free vibration, damped and forced vibration starting from the defining equation of SHM.	Chalk and Talk	A very basic toy model with a huge field of application like Acoustics, Solid State Physics, Optics, Quantum Mech., Nuclear models and so on.
Superposition of Harmonic Oscillations	5	Interesting cases of motion comes up when two or more simple harmonic vibrations are applied simultaneously to a particle.	Chalk and Talk	Find application in acoustics, optics where this aspect leads to very interesting

				phenomena of sound and light waves.
Wave motion	5	Studies the differential eqn. and propagation of different kinds of waves.	Chalk and Talk	Waves of different kinds appear in different places and their study is useful in Electromagnetism, Optics, Acoustics, Quantum Mech., etc.
Superposition of Harmonic Waves	10	How superposition of two or more waves leads to very interesting wave phenomena is discussed.	Chalk and Talk	The underlying topic find application in acoustics, optics, electromagnetic theory, quantum mechanics, condensed matter physics and so on.
Wave optics	5	Derives the basic laws of Optics, starting from Huygen's wave theory.	Chalk and Talk	Demonstrates the strength of the wave theory of light. Forms the basis of the latter applications of Wave Optics.
Interference	8	Very interesting observed phenomenon employing light called interference is discussed based on wave nature of light.	Chalk and Talk	Demonstrates the wave nature of light.
Interferometers	8	Different optical set up employing interference phenomenon of light are demonstrated and their applications are discussed.	Chalk and Talk	Finds application in optics, modern physics etc.
Diffraction	3	Another very interesting phenomenon employing light called diffraction is discussed.	Chalk and Talk	Demonstrates the wave nature of light. Forms the basis of (Quantum) Wave mechanics.

Waves and Optics (Practical)

PHS-A-CC-2-4-P Credits: 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
To determine the frequency of an electric tuning fork by Melde's experiment and verify lambda^2-T law	6	By employing Melde's experiment one can determine frequency of an electric tuning fork	Practical	To get familiar with an electric tuning fork and also develop some idea about standing waves.
To determine the dispersive power and Cauchy constants of the material of a prism using mercury source	4	To determine coefficients of Cauchy dispersion formulae of the material of the prism	Practical	To learn how to handle a spectrometer and study dispersion of light and variation of refractive index with wavelength.
To determine wavelength of sodium light using Fresnel Biprism.	4	To determine wavelength of any light source	Practical	To observe the interference of the division of wavefront type
To determine wavelength of sodium light using Newton's Rings	4	To determine wavelength of any light source	Practical	To observe the interference of the division of amplitude type
To determine the thickness of a thin paper by measuring the width of the interference fringes produced by a wedge-shaped Film	4	To determine thickness of a thin paper by measuring fringe-width of interference fringes	Practical	By measuring fringe-width of interference fringes one can determine very small lengths like the thickness of a thin paper
Measurement of the spacing between the adjacent slits in a grating by measuring Sinθ vs λ graph of a certain order of grating spectra	4	To determine the spacing between the adjacent slits of a grating	Practical	By producing diffraction pattern one can determine the spacing between the adjacent slits of a grating

LEARNING MODULE FOR BSC GENERAL

SUBJECT- PHYSICS

Semester - 2: Electricity and Magnetism

Electricity and Magnetism (Theory)

Paper: PHS-G-CC-2-2-TH Credits: 4

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Essential Vector Analysis	4	Vector Algebra and basic Vector Calculus is introduced.	Chalk and Talk	The mathematical techniques find huge application in subjects like Mechanics, Electro-magnetism, etc.
Electrostatics	15	Basic idea of electrostatic field, potential of any charge distribution is discussed. Then various aspects of electrostatic field and potential are discussed followed by determination of electrostatic field and potential of few symmetric charge distributions. Idea of electric dipole is introduced followed by discussion of dielectric properties of matter.	Chalk and Talk	Discussed topics find application in condensed matter physics, nuclear physics, and modern physics and so on.
Magnetism	15	First the idea of magnetic force is introduced followed by the calculation of magnetic field of few steady current distributions. Then vector aspects of magnetic field induction are discussed followed by introduction of magnetic vector potential. Then the idea of magnetic dipole is introduced and then field and potential of magnetic dipole is calculated. Then magnetic properties of matter are discussed.	Chalk and Talk	Underlying ideas form the basic building blocks of classical and quantum field theory. These topics find application in condensed matter physics and material science.
Electromagnetic induction	4	Laws of electromagnetic induction are discussed. Then ideas of self and mutual induction are discussed. Then Maxwell's equations are	Chalk and Talk	The discussed ideas form the basic of electromagnetic theory.

		discussed.		
Electrodynamics	6	Maxwell's equations are discussed and then wave equation is derived from these equations. Propagation of EM wave in vacuum and dielectric medium is discussed.	Chalk and Talk	Conveys the idea of the unification of electric and magnetic interactions. Forms the basis of classical and quantum field theory.

Electricity and Magnetism (Practical)

Paper: PHS-G-CC-2-2-P Credits: 2

Topic	**No. of Classes required**	**Objective of the topic**	**Strategy of teaching implemented**	**Outcome**
Determination of unknown resistance by Carey Foster method.	4	To get familiar with Carey-Forster's bridge and use it to measure an unknown low resistance	Practical	To understand the basic principles of low resistance measurement
Measurement of a current flowing through a register using potentiometer	4	To get familiar with Potentiometer and use it to measure an unknown low resistance	Practical	To understand the basic principles of measuring small potential differences
Determination of the horizontal components of earth's magnetic field	4	To measure the horizontal component of earth's magnetic field experimentally	Practical	Learning to handle magnetometers and develop some idea on terrestrial magnetism
Conversion of an ammeter to a voltmeter	4	To convert a given ammeter to a voltmeter of suitable range and calibrate the voltmeter so prepared	Practical	One can convert an ammeter to a voltmeter
Conversion of a voltmeter to an Ammeter	4	To convert a given voltmeter to an ammeter of suitable range and calibrate the ammeter so prepared	Practical	One can convert a voltmeter to an ammeter

LEARNING MODULE FOR BSC HONOURS

SUBJECT- PHYSICS

Semester – 3 : Mathematical Physics – II

Mathematical Physics – II (Theory)

Paper : PHS-A-CC-3-5-TH Credits : 4

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Fourier Series	10	A periodic function can be expanded in terms of sinusoidal functions under certain conditions. Techniques and properties of such expansion is studied. The techniques can even be extended to a-periodic functions using certain tricks.	Chalk and Talk, Smart Class	A very important mathematical tool, which finds application in acoustics, heat, electricity-magnetism, electronics and many other branches.
Frobenius Method and Special Functions	16	A general technique for solving ordinary differential equations. The solution appears in the form of a series which is often a well-known function, e.g., the Legendre polynomial or the Bessel function. The properties of such functions are studied.	Chalk and Talk Smart Class Python Programmig	Not all the differential equations appearing in Physics can be directly solved using simple techniques. A general way of tackling such problems is studied. Application is found in Electrostatics, Magnetostatics Quantum Mechanics, and so on.
Some Special Integrals	4	Methods of evaluating some frequently appearing integrals (e.g., beta, gamma and error function) are learnt.	Chalk and Talk Smart Class	Methods of evaluating some important integrals and their inter-relation are discussed. Such integrals appear in many areas like Statistics, Kinetic theory of gases, Quantum Mechanics, etc.
Integral transforms	8	Definition of Fourier Transform and its inverse. F.T. of Delta function and other functions. Properties of F.T. Application of F.T. in solving differential equations.	Chalk and Talk Smart Class	Fourier Transform is introduced as an extension of the Fourier series. Its properties and the inverse transform are studied. It is demonstrated how the application of F.T. reduces partial diff. eqns. to ordinary diff. eqns.
Introduction to		The concept of random numbers		The concept of probability is of huge

Probability	5	is introduced. Binomial, Poisson and Gaussian distribution functions and their mean, properties like mean, variance, etc., are studied.	Chalk and Talk, Smart Class	importance in Statistics and forms the basis of Statistical Mechanics. This section discusses some basic prob. distributions (discrete and continuous) and their properties.
Partial Differential Equations	5	Partial differential equations are differential equations involving more than one independent variables. Among different methods for solving them, the 'separation of variable' technique is discussed.	Chalk and Talk, Smart Class	Solving partial differential equations become essential in many branches of Physics, e.g., Acoustics, Heat, Electromagnetism, Quantum Mechanics, etc.

Mathematical Physics – II (Practical)

Paper : PHS-A-CC-3-5-P Credits : 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Intro. To numpy and scipy	8	Learning the use of different modules like numpy, linalg, matplotlib and scipy.	Lectures and Practical	Learning tools for handling arrays, operations of linear algebra, plotting graphs, optimization and solving differential equations.
Using numpy for matrix operators	6	Learning the use of the numpy module and its submodules for matrix addition, subtraction, diagonalization solving linear equations, etc.	Lectures and Practical	The matrix operations are of extreme importance in Physics. Here one learns short cut techniques for such operations using numpy.
<u>Scientific Applications :</u> Lagrange Interpolation Newton Forward Interpolation	8	Learning the method of interpolation using Lagrange and Newton (Forward interpolation) techniques	Lectures and Practical	One learns to fit a set of data to a polynomial function and evaluate the function at an intermediate point.
<u>Numerical Integration :</u> Trapezoidal rule Simpson's one-third rule n-point Gaussian Quadrature method	8	Learning different techniques of numerical Integration	Lectures and Practical	One often encounters integrals that are hard to evaluate analytically. Here one learns to find their approximate values by numerical techniques.
<u>Soln. of ODE :</u>		Method of solving 1st		Differential equations are faced in almost all

1st order and 2nd order differential eqn. using Runge-Kutta (4th order) algorithm.	5	and 2nd order, ordinary diff. eqn., based on Runge-Kutta algorithm is developed.	Lectures and Practical	branches of Physics. Here one learns an approximate method of solving them.
Curve fitting : With numpy polynomials With user-defined functions	5	One learns to fit a set of data to a polynomial or a user defined function.	Lectures and Practical	One obtains two sets of data from an experiment and wants to find the functional dependence between them. Here one learns numerical techniques to answer such questions.

Semester – 3 : Thermal Physics

Thermal Physics (Theory)

Paper : PHS-A-CC-3-6-TH Credits: 4

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Introduction to Thermo-dynamics	16	A very important branch of Physics that discusses basically, the interaction between mechanical and thermal energy. The zero'th, the first and the second law of Thermodynamics are discussed, together with their applications. The concept of 'entropy' is introduced and the properties are studied.	Chalk and Talk, Smart board	This section forms the basis of Thermal Physics. Finds huge application in studying the properties of solids, liquids, gases and even radiation. Useful in relating different physical quantities. Applicable in various engineering problems (e.g., designing heat engines or coolers).
Thermo-dynamic Potentials	10	Different Thermodynamic potentials (e.g., Gibb's and Helmholtz' free energy) are introduced and their properties are learned. The four Maxwell relations relate the derivatives of entropy with those of the state-variables. These relations are proved and their applications are studied. The phenomenon of Phase transition is studied.	Chalk and Talk, Smart board	The Thermodynamic potentials are state functions and their derivatives generate useful thermodynamic quantities. The Maxwell equations are very important results and prove to be very useful tools in deriving Thermodynamic identities. Important results related to Phase transition are discussed and the basic

				techniques of low temperature generation is learnt.
Kinetic Theory of gases	15	A gas is viewed as a collection of molecules and with some simplifying assumptions, the expressions of various physical quantities like pressure, temperature, conductivity, etc. are expressed in terms of molecular parameters.	Chalk and Talk, Smart board	The behavoiur of an ideal gas and also the real gasses are explained on the basis of the kinetic molecular model.
Conduction of Heat	3	'Fourier Heat Equation' is established and solved for a particular geometry.	Chalk and Talk, Smart board	Conduction is one of the three mechanisms of heat transport and Fourier heat equation is the basic equation governing flow of heat by conduction. The equation is established and the solution is sought in the simple case of rectilinear flow.

Thermal Physics (Practical)

Paper : PHS-A-CC-3-6-P Credits: 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Determination of the co-efficient of thermal expansion of a metallic rod using optical lever.	4	To find the coefficient of linear expansion of a solid.	Practical	To study thermal expansion of solids and also to learn the use of an optical lever.
Calibration of a thermo-couple by direct measurement of the thermo-emf using potentiometer.	4	To study Seebeck effect and draw the temperature – thermo emf curve.	Practical	To be familiar with thermo electricity and also the use of potentiometer for measurement of small voltages.
To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method.	4	To determine the coefficient of thermal conductivity of a bad conductor provided in the form of a thin disc.	Practical	To study the mechanism of heat conduction. Learning to take care of the radiation correction while measuring

				conductivity.
To determine the boiling point of a liquid using Platinum Resistance Thermometer	6	To find the boiling point of a given liquid by measuring the resistance of the Pt-coil while in melting ice, boiling water and the boiling liquid.	Practical	Learning the use of Platinum resistance thermometer for measuring temperature.

Semester – 3 : Modern Physics

Modern Physics (Theory)

Paper : PHS-A-CC-3-7-TH Credits: 4

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Radiation and its nature	12	Phenomena like black body radiation, photo electric effect and Compton effect are described, where the particle nature of light is exhibited. Davisson-Germer expt. is described, where wave nature of electron is manifested. De Broglie hypothesis and properties of mater wave and the wave function are discussed. The thought experiments with the double-slit and the γ-ray microscope are discussed and the uncertainty principle is introduced.	Chalk and Talk, Smart board and some Lab. experiments	At the beginning twentieth century, various observations contradicted the notions of Classical Physics. The particle nature of light as well as the wave nature of matter particles was established. The section deals with this dual nature and properties of the matter wave. Some thought experiments demonstrate the problem regarding position measurement and thus the concept of Quantum uncertainty is introduced.
Basics of Quantum Mechanics	15	The basic formulation of Quantum Mechanics is introduced, i.e., description of states by vectors (wave function) and dynamical variables by operators. Schrodinger eqn, (together with its boundary cond.) is introduced and solved for simple, one dimensional problems. It is explained how Quantum tunneling can explain the α-decay problem. The problem of simultaneous measurements and compatibility of observables are discussed.	Chalk and Talk, Smart board	The basic structure of Quantum Mechanics is formulated. Students learn how to determine the time evolution of states, the energy eigenvalues and the eigen functions in simple problems.

Nuclear Structure	5	The structure of a nucleus is described together with the relation of its size with the mass no. The nature of the nuclear force is explained and the N vs. Z curve is discussed. Various nuclear models, e.g., the liquid drop and the shell model is discussed along with their consequences.	Chalk and Talk, Smart board	The students learn the preliminaries of Nuclear Physics. The structure of the nucleus and the nature of the nuclear force is discussed. Different nuclear models are described and their predictions are discussed.
Interactions with and within nucleus	8	Radioactivity and the emission of β and γ rays are discussed. The β-ray spectrum and the neutrino hypothesis is explained. The pair production by γ-ray is discussed. Nuclear fission and fusion processes are described and the energy generation in them is explained. The products of a fission process (specially neutrons) are mentioned and he chain reaction is explained. It is explained how fusion process can explain the source of energy of the Sun.	Chalk and Talk, Smart board	The phenomenon of radioactivity, a feature of unstable nuclei, is explained. It is explained how the β-ray spectrum demands the existence of neutrinos. It is explained why the pair production by γ-ray cannot occur in vacuum. The nuclear fusion is a potential solution of our energy crisis. Various aspects of the process (specially energy production) are discussed, The nuclear fusion process is described along with its role in production of solar energy.
Lasers	5	The concept of 'spontaneous' and 'stimulated' emission are explained and the 'A' and 'B' coefficients are introduced. The concept of a 'metastable state' is introduced. The term 'population inversion' is introduced and it is explained how 'optical pumping' can achieve this state. Ruby and He-Ne Lasers are described as examples.	Chalk and Talk, Smart board, Demonstration in the Lab.	Einstein's derivation of Planck's law (using A, B coefficients) is explained. The basic concepts involved in Laser production, e.g., metastable states, population inversion, etc., are explained. Examples of three and four level Lasers are discussed.

Modern Physics (Practical)

Paper : PHS-A-CC-3-7-P Credits: 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Measurement of Planck's Constant using LED	4	The stopping potential and hence electron kinetic energy is measured for lights of different colours. A plot of K.E. vs frequency provides the Planck' Constant	Practical	Planck's Constant plays a key role in whole of Quantum Mechanics. The expt. Shows how to determine its value. Einstein's law of Photo-elecricity is also verified.
Verification of Stefan's law of radiation by the measurement of voltage and current of a torch bulb, glowing it above draper point.	4	The temperature of the filament of a bulb is found from a calibration curve, by measuring its resistance. A plot of the electric power fed to the bulb, against its temperature demonstrates the 4^{th} power law dependence.	Practical	The experiment establishes Stefan's law of radiation.
Determination of e/m of electrons by using bar magnet.	4	The specific charge of electron is determined by measuring the deflection of an electron beam in an electric and a magnetic field.	Practical	The method demonstrates how the properties of the sub-atomic particles, like their charge, mass etc., can be determined experimentally.
To study the photo-electric effect : variation of photo-current vs. intensity and wavelength of light.	4	The photo-current is measured for different colour and intensity of the incident light.	Practical	Photo-electric effect was one of the earliest detected signatures of Quantum Mechanics. This experiment demonstrates features of this effect that deny classical explanation.
To show the tunneling effect in tunnel diode using I-V characteristics.	4	The voltage –current characteristic of a tunnel diode is drawn, showing the –ve slope portion.	Practical	Tunneling is a mysterious and purely Quantum mechanical phenomenon. The experiment provides a practical application of the effect.

Semester – 3 : Skill Enhancement Course

SEC-A2: Renewable Energy and Energy Harvesting

Renewable Energy and Energy Harvesting - (Theory)

Paper: PHS-A-SEC-A-TH Credits : 2

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Fossil Fuels and Alternative Sources of Energy	2	The limitation of fossil fuel and nuclear fuel is explained and need of renewable energy sources are emphasized. An overview of different possible renewable energy sources is provided.	Chalk and Talk	The world is in an energy crisis now. The fossil fuels are going to be exhausted in near future and the nuclear fuels are costly and dangerous. Alternative sources of energy are therefore needed to be explored.
Solar Energy	5	The importance of solar energy is explained. The different ways of trapping and utilizing solar energy like solar pond, solar water heater, solar cooker, etc., are described. Different aspects of Photo-voltaic systems are Discussed.	Chalk and Talk	In the ensuing days of energy crisis, solar energy is going to play a crucial role. Its importance is underlined. The different ways of using solar energy, storing it and converting it to electrical energy are discussed.
Wind Energy Harvesting	2	Wind turbine and different electrical parts associated with it are described, along with power electronic interfaces and grid interconnection topologies	Chalk and Talk	Wind energy is a renewable source of energy and it is particularly useful where open land is abundant. The section discusses the technique of harvesting this source of energy.
Ocean Energy	3	Energy can be extracted from the waves, the tides, the temp. gradient and the bio mass of the ocean. The characteristics and statistics related to ocean waves and tides are mentioned. The technologies involved in tapping the above mentioned energy sources are described.	Chalk and Talk	India is a country with a huge coast line. So, ocean could be an important source of energy for us. The technologies required to extract ocean energy stored in various forms are discussed in this section.

Geothermal Energy	1	Geothermal energy comes from the temperature gradient existing along the depth below the earth's crust. The way it can be extracted is discussed.	Chalk and Talk	Geothermal energy is a huge source of energy. However, it is difficult to extract mainly because of the cost involved. The techniques involved in the process are learnt.
Hydro Energy	2	The Hydro power resources and hydro power technology is discussed. Its environmental impact is also mentioned.	Chalk and Talk	Hydro-electricity is a renewable form of energy source and it can, at least partly substitute fossil fuels. The technology of hydro-electric power plant is described. The impact on environment in building such plants is also mentioned.
Piezoelectric Energy Harvesting	2	The piezo-electric effect is introduced. Its characteristics and the mathematical theory is learnt. Piezo-electric generators and energy generation using this effect is discussed.	Chalk and Talk	Piezo-electric effect is essentially conversion of a mechanical oscillation into an electrical one and vice-versa. One learns about this effect and also its application in energy generation.
Electromagnetic Energy Harvesting	2	Mathematical model and application of linear generators are discussed. The concept of carbon capture technology is introduced. The environmental issues are also discussed.	Chalk and Talk	One learns about the linear generators. The carbon capture technology and its usefulness in protecting the environment is discussed.
Fuel Cell	1	Design, operation and application of fuel cells are studied. Different types of fuel cells are also mentioned.	Chalk and Talk	Fuel cells are introduced and their operation and application are discussed.

LEARNING MODULE FOR BSC GENERAL

SUBJECT- PHYSICS

Semester – 3 : Thermal Physics and Statistical Mechanics

Thermal Physics and Statistical Mechanics (Theory)

Paper: PHS-G-CC-3-3-TH Credits: 4

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Laws of Thermo-dynamics	12	A very important branch of Physics that discusses basically, the interaction between mechanical and thermal energy. The zero'th, the first and the second law of Thermodynamics are discussed, together with their applications. The concept of 'entropy' is introduced and the properties are studied.	Chalk and Talk	This section forms the basis of Thermal Physics. Finds huge application in studying the properties of solids, liquids, gases and even radiation. Useful in relating different physical quantities. Applicable in various engineering problems (e.g., designing heat engines or coolers).
Thermo-dynamic Potentials	8	Different Thermodynamic potentials (e.g., Gibb's and Helmholtz' free energy) are introduced and their properties are learned. The four Maxwell relations relate the derivatives of entropy with those of the state-variables. These relations are proved and their applications are studied. The phenomenon of Phase transition is studied.	Chalk and Talk	The Thermodynamic potentials are state functions and their derivatives generate useful thermodynamic quantities. The Maxwell equations are very important results and prove to be very useful tools in deriving Thermodynamic identities. Important results related to Phase transition are discussed and the basic techniques of low temperature generation is learnt.
Kinetic Theory of gases	10	A gas is viewed as a collection of molecules and with some simplifying assumptions, the expressions of various physical quantities like pressure, temperature, conductivity, etc. are expressed in terms of molecular parameters.	Chalk and Talk	The behaviour of an ideal gas and also the real gasses are explained on the basis of the kinetic molecular model.
Theory of Radiation	4	Planck's law concerning energy distribution in black body radiation is derived and other laws like Wien's law, Stefan's law etc., are obtained as corollaries.	Chalk and Talk	Planck's law of black body radiation marks the starting point of Quantum Physics. The particle nature of light is understood in this section.
Statistical Mechanics	10	The basic concepts of Statistical Mechanics are explained. The three distribution functions, viz., Boltzmann, Fermi and Bose are stated and their consequences are	Chalk and Talk	A macroscopic body is viewed as a collection of particles and rules of statistics are applied. The expressions for different

		discussed.		thermodynamic variables are obtained (as average values) as outcome.

Thermal Physics and Statistical Mechanics (Practical)

PHS-G-CC-3-3-P Credits: 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Determination of the co-efficient of thermal expansion of a metallic rod using optical lever.	4	To find the coefficient of linear expansion of a solid.	Practical	To study thermal expansion of solids and also to learn the use of an optical lever.
Verification of Stefan's law of radiation by the measurement of voltage and current of a torch bulb glowing it beyond draper point.	4	To verify the T^4 law of radiation.	Practical	To demonstrate Stefan's law of black body radiation, to note the departure from a perfect black body and also to learn the technique of determining temperature from a calibration curve.
To determine the thermal coefficient of resistance using Carey Foster bridge	6	To find the thermal coefficient of resistance of a coil by measuring its resistance at room and steam temperature.	Practical	To learn the use of Carey Foster bridge and also to study the variation of resistance of a metal with temperature.
To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method.	6	To determine the coefficient of thermal conductivity of a bad conductor provided in the form of a thin disc.	Practical	To study the mechanism of heat conduction. Learning to take care of the radiation correction while measuring conductivity.
Determination of the pressure coefficient of air using Jolly's apparatus.	4	To study the variation of pressure of a gas (assumed ideal) with temperature.	Practical	Regnault's law states that (under the ideal gas approximation), the pressure of a gas should vary linearly with the temperature. Here we seek the experimental proof of this law also determine the pressure coefficient.

Academic Plan

Department of Physiology

Vijaygarh Jyotish Ray College
8/2, Bejoygarh
Jadavpur
Kolkata-700032

PART I GENERAL (1+1+1 SYSTEM) THEORETICAL

Paper	Unit	No. Of Topic	Name of the Topic	Topic	Teacher	Month
I	01	1	Units of Human System	Structure and functions of plasma membrane, nucleus and different cell organelles – Endoplasmic reticulum, Golgi bodies, Mitochondria, Lysosome and Peroxisome.	SM	Feb
I	01	1	Units of Human System	Structure, function and classification of Epithelial, Connective, Muscular and Nervous tissues.	SM	Feb
I	01	2	Biophysical and Biochemical Principles	Physiological importance of the following physical processes: Diffusion , Osmosis, Dialysis, Ultrafiltration , Surface tension, Adsorption and Absorption.	SM	Nov
I	01	2	Biophysical and Biochemical Principles	A brief idea about acids, bases, buffers, indicators	SM	Nov
I	01	2	Biophysical and Biochemical Principles	pH – definition, significance and maintenance of pH in the blood. Colloids - definition, classification and physiological importance.	SM	Nov
I	01	2	Biophysical and Biochemical Principles	Enzymes: definition, classification, factors affecting enzyme action. Concept of coenzymes and isozyme	SM	Nov
I	01	3	Digestive System	Structure in relation to functions of alimentary canal and digestive glands.	SM	Oct
I	01	3	Digestive System	Composition, functions and regulation of secretion of digestive juices including bile.	SM	Nov

I	01	3	Digestive System	Digestion and absorption of carbohydrate, protein and lipid. Movements of the stomach and small intestine.	SM	Nov
I	01	4	Biochemistry and Metabolism	**Carbohydrates:** Definition and classification. *Monosaccharides* – Classification, structure. Chemical reactions of monosaccharides (Glucose & Fructose) ---- Reactions with concentrated mineral acids, alkali, phenylhydrazine and their biochemical importance. *Disaccharides* – Maltose, Lactose and Sucrose: Structure, occurrence and physiological importance. *Polysaccharides* – Starch, Glycogen, Dextrin, Cellulose.	SM	Aug
I	01	4	Biochemistry and Metabolism	**Lipids:** Definition and classification. Fatty acids ----- Classification. Properties of Fat and Fatty acids—Hydrolysis, Saponification, Saponification number, Iodine number, Hydrogenation, Rancidity-Acid number. Phospholipids, Cholesterol & its ester - physiological importance. **Amino acids, Peptides and Proteins:** Classification and structure. Structure of peptide bonds.	SM	Aug
I	01	4	Biochemistry and Metabolism	Glycolysis, TCA cycle, Glycogenesis, Glycogenolysis. Gluconeogenesis. Depot fat. Beta oxidation of saturated fatty acid Ketone bodies – formation and significance. Deamination, Transamination. Amino acid pool - fate and functions of amino acids in the body. Formation of urea and its importance.	SM	Sep

I	01	5	Nutrition	Basic constituents of food and their nutritional significance. Vitamins: definition, classification, functions, deficiency symptoms and daily requirements. Hypervitaminosis. Mineral metabolism - Ca. P, Fe.	SM	Dec
I	01	5	Nutrition	BMR: definition, factors affecting, determination by Benedict-Roth apparatus. Respiratory quotient: definition, factors affecting and significance.	SM	Dec
I	01	5	Nutrition	Biological value of proteins. Essential and non-essential amino acids, Nitrogen equilibrium. Minimum protein requirement-Positive and negative nitrogen balance. SDA: definition and: importance.	SM	Dec
I	02	1	Blood and Body Fluids	Blood: composition and functions. Plasma proteins: origin and functions. Plasmapheresis. Bone marrow.	SM	Dec
I	02	1	Blood and Body Fluids	Formed elements of blood - their morphology and functions. Erythropoiesis and leucopoiesis.	SM	Jan
I	02	1	Blood and Body Fluids	Haemoglobin: different types of compounds and derivatives. Blood volume and its determination (dye method and radioisotope method) and regulation.	SM	Jan
I	02	1	Blood and Body Fluids	Coagulation of blood mechanism, factors affecting, procoagulants, anticoagulants, and disorders of coagulation. Lymph and tissue fluids: composition, formation, and functions.	SM	Jan
I	02	2	Cardiovascular Physiology I	Anatomy and histology of the heart. Properties of cardiac muscle. Origin and propagation of cardiac impulse.	PK	Aug

I	02	2	Cardiovascular Physiology I	Cardiac cycle: events. Heart sounds. Heart rate. Cardiac output: methods of determination (dye dilution and Fick principle), factors affecting, regulation.	PK	Aug
I	02	3	Cardiovascular Physiology II	Structure of arteries, arterioles, capillaries. venules and veins. Pulse - arterial and venous.	PK	Sep
I	02	3	Cardiovascular Physiology II	Blood pressure and its regulation and factors controlling. Baro- and chemoreceptors. Vasomotor reflexes. Methods of measurement of blood pressure. Peculiarities of regional circulations: coronary, pulmonary, renal, hepatic and cerebral	PK	Oct
I	02	4	Respiratory Physiology	Anatomy and histology of the respiratory passage and organs. Role of respiratory muscles in breathing. Artificial respiration. Significance of physiological and anatomical dead space. Lung volumes and capacities.	PK	Nov
I	02	4	Respiratory Physiology	Exchange of respiratory gases between lung and blood and between blood and tissues. Transport of oxygen and carbon dioxide in blood. Regulation of respiration -neural and chemical. Hypoxia	PK	Nov, Dec
I	02	5	Renal Physiology	Relationship between structure and functions of kidney. Mechanism of formation of urine. Normal and abnormal constituents of urine. Physiology of urine storage and micturition. Renal regulation of acid-base balance. Non-excretory functions of kidney.	PK	Dec, Jan

PART II GENERAL (1+1+1 SYSTEM) THEORETICAL

Paper	Unit	No. of Topic	Name of Topic	Topic	Teacher	Month
II	03	1	Muscle Physiology	Different types of muscle and their structure. Red and white muscle. Muscular contraction: structural, mechanical and chemical changes in skeletal muscle during contraction and relaxation. Isotonic and isometric contractions.	SM	Sep
II	03	1	Muscle Physiology	Properties of muscle: all or none law, beneficial effect, summation. Refractory period, tetanus, fatigue. A brief idea about the muscle spindle.	SM	Sep
II	03	2	Nerve Physiology	Structure and classification of nerves. Origin and propagation of nerve impulse. Velocity of impulse in different types of nerve fiber. Properties of nerve fibers: all or none law, rheobase and chronaxie, refractory period. indefatiguability.	SM	Oct
II	03	2	Nerve Physiology	Synapses: structure, different types, mechanism of synaptic transmission. Motor unit. Myoneural junction: structure, mechanism of impulse transmission. Degeneration and regeneration in nerve fibers.	SM	Nov
II	03	3	Nervous System I	A brief outline of organization and basic functions (sensory, motor and association) of the nervous system, central and peripheral nervous system. (emphasis on the structure of spinal cord and brain stem).	PK	Aug
II	03	3	Nervous System I	Ascending tracts carrying touch, kinaesthetic, temperature and pain sensations. Descending tracts:	PK	Sep

				pyramidal tract and brief outline of the extra-pyramidal tracts. Pain. Reflex action - definition, reflex arc, classification, properties. Functions of the spinal cord. Outline of functions of brain stem.		
II	03	4	Nervous System II	A brief idea of the structure, connections and functions of cerebellum. Different nuclei and functions of thalamus and hypothalamus. Cerebral cortex: histological structure and localization of functions. CSF : composition, formation,circulation and functions.	PK	Oct
II	03	4	Nervous System II	A brief description of the organization of the autonomic (sympathetic and parasympathetic) nervous system. Functions of sympathetic and parasympathetic nervous system. A brief idea of speech, aphasia, conditioning, learning and memory.	PK	Nov
II	03	5	Sensory Physiology	Classification of general and special senses and their receptors. Receptors as biological transducer. ***(a)Olfaction and Gustation****:* Structure of sensory organ, neural pathway of olfactory and gustatory sensation. Physiology of olfactory and gustatory sensation. Olfactory and gustatory adaptation. After-taste. **(b)** ***Audition****:* Structure of ear, auditory pathway, mechanism of hearing. **(c)*Vision****:* Structure of the eye. Histology of retina. Visual pathway. Light reflex. Chemical changes in retina on	PK	Dec, Jan

				exposure to light. Accommodation – mechanism and pathway. Errors of refraction. Positive and negative after-image. Light and dark adaptation. Elementary idea of colour vision and colour blindness.		
II	04	1	Skin and Regulation of Body Temperature	Structure and functions of skin. Insensible and sensible perspiration Regulation of body temperature -- physical and physiological processes involved in it. Physiology of sweat secretion and its regulation.	SM	Feb
II	04	2	Endocrine System I	Anatomy of endocrine system. Hormones - classification. Basic concept of regulation of hormone actions. Positive and negative feedback mechanism. Elementary idea of hormone action	SM	Oct
II	04	2	Endocrine System I	***Hypothalamus:*** Basic concept of neurohormone. Hypothalamo-hypophyseal tract and portal system. ***Pituitary****:* Histological structure, hormones, functions. Hypo and hyperactive states of pituitary gland. ***Thyroid:*** Histological structure. Functions of thyroid hormones (T4T3) Thyrocalcitonin. Hypo and hyper-active states of thyroid. ***Parathyroid****:* Histological structure, functions of parathyroid hormone. Tetany.	SM	Nov
II	04	3	Endocrine System II	***Adrenal Cortex****:* Histological structure and functions of different hormones. Hypo and hyper-active states of adrenal cortex. ***Adrenal Medulla****:* Histological structure and	SM	Nov

				functions of medullary hormones. The relation of adrenal medulla with the sympathetic nervous system.		
II	04	3	Endocrine System II	***Pancreas****:* Histology of islets of Langerhans. Origin and functions of pancreatic hormones. Diabetes mellitus. Brief idea of the origin and functions of renin-angiotensin, prostaglandins. Erythropoietin and melatonin. Elementary idea of gastrointestinal hormone.	SM	Dec
II	04	4	Reproductive Physiology I	Primary and accessory sex organs and secondary sex characters. Testis: histology, spermatogenesis, testicular hormones and their functions. Ovary: histology, oogenesis, ovarian hormones and their functions.	PK	Jan
II	04	5	Reproductive Physiology II	Oestrus and menstrual cycles and their hormonal control. Fertilization, implantation and structure and functions of placenta. Maintenance of pregnancy – role of hormones. Development of mammary gland and lactation - role of hormones.	PK	Feb

PART II GENERAL (1+1+1 SYSTEM) PRACTICAL

Paper	Unit	No. of Topic	Name of Topic	Topic	Teacher	Month
III	05	1	Histology	*i)* ***Haematological experiments*** *:* a) Leishman's staining of human blood film and identification of different types of blood corpuscles. b) Preparation of Haemin crystals. *ii)* ***Fresh tissue***	SM	Aug, Nov, Dec

				experiments: a) Examination and staining of fresh tissues (other than blood) squamous, cornified, ciliated and columnar epithelium, skeletal muscle, cardiac muscle by methylene blue stain. b) Silver nitrate preparation of node of Ranvier. *iii)* ***Identification of permanent slides***: Bone, Lung, Trachea, Spleen, Lymph gland, Liver, Salivary gland, Pancreas, Adrenal gland, , Thyroid gland, Spinal cord, Cerebellum, Cerebral cortex, Kidney, Skin, Testis, Ovary, Tongue, Oesophagus, Stomach, Small intestine, Large intestine.		
III	05	2	Biochemistry	***Qualitative Experiments:*** Qualitative tests for identification of starch, dextrin, lactose, sucrose, glucose, fructose, albumin, gelatin, peptone, lactic acid, hydrochloric acid, uric acid, acetone, glycerol, bile salts, urea. ***Quantitative Experiments:*** a) Quantitative estimation of glucose by Benedict's method. b) Quantitative estimation of amino-nitrogen by Sorensen' s0 formol titration method. (Percentage and total quantity to be done.)	SM	Sep, Oct

III	05	3	Experimental Physiology with Human Experiment	a) Use of kymograph, induction coil and key. b) Recording of simple muscle curve with sciatic-gastrocnemius muscle preparation of toad and determination of latent period, period of contraction and period of relaxation and maximum height of contraction. c) Normal tracing of toad's unperfused heartbeat. d) Effect of warm saline on toad's unperfused heartbeat. e) Measurement of systolic and diastolic arterial pressure by sphygmomanometer and determination of pulse pressure and mean pressure during rest and exercise.	SM	Aug
III	05	4	Laboratory Note Books	Students will have to prepare separate note books on- i) Biochemistry, ii) Histology, and iii) Experimental	SM	
III	05	5	Viva-voce	Questions will be asked from the experiments given in the examination.		

PART III GENERAL (1+1+1 SYSTEM) THEORETICAL

Paper	06	No. of Topic	Name of Topic	Topic	Teacher	Month
IV-A	06	1	Haematology	Blood groups - ABO and Rh. Blood transfusion - precaution and hazards. Immunological basis of identification of ABO and Rh blood groups. Functions and estimation of haemoglobin. Abnormal haemoglobins - thalassaemia and sickle-cell anaemia.	PK	Aug

IV-A	06	1	Haematology	Definition, determination and significance of TC, DC, ESR, Arneth count, PCV, MCV, MHC, MCHC, bleeding time, clotting time and prothrombin time. Anaemia - types (definition and causes). Leucocytosis, leucopenia and leukaemia. Purpura	PK	Sep
IV-A	06	2	Biochemistry and Molecular Biology	Brief idea of HMP shunt and its significance (detailed enzymatic reactions are not required). Lipoproteins - types and functions. Purine and pyrimidine bases, nucleosides, nucleotides and polynucleotides. Structure of DNA and RNA. Elementary idea of gene, genome, transcription, genetic code, translation and genetic engineering.	SM	Sep
IV-A	06	2	Biochemistry and Molecular Biology	Pathophysiological significance of the following blood constituents: glucose, urea, creatinine, uric acid, cholesterol, bilirubin, SGPT and SGOT, alkaline and acid phosphatases and ketone bodies.	SM	Sep
IV-A	06	3	Microbiology and Immunology	Virus - DNA virus and RNA virus. Bacteriophage. Bacteria-structure and morphological classification. Gram positive and Gram negative and acid-fast bacteria. Pathogenic and non-pathogenic bacteria - definition with a few examples. Sterilization and Pasteurization. A brief idea of antibiotics.	SM	Nov
IV-A	06	3	Microbiology and Immunology	Elementary knowledge of innate and acquired immunity. Humoral and cell mediated immunity	SM	Nov

				Vaccination - principles and importance of immunization. Basic principle of immunological detection of pregnancy.		
IV-A	06	4	Social Physiology	Composition and nutritional value of common Indian foodstuffs – rice, wheat, pulses, egg, meat, fish and milk. Dietary fibers. Calorie requirement. Concept of ACU. Principle of balanced diet formulation of individuals - infants, growing children, students, pregnant women, lactating women and aged persons. Dietary management or obese, diabetic person, hypertensive person and athlete. Diet survey. Malnutrition and its causes - PCM, marasmus, kwashiorkor their prevention. Iron and iodine deficiency.	PK	Nov
IV-A	06	4	Social Physiology	Population problem and its control. Problem of infertility and brief idea about *in vitro* fertilization and intrauterine gamete transfer. Brief idea of AIDS and hepatitis B and their preventions.	PK	Nov
IV-A	06	5	Work Physiology	Physical work - definition and units of measurement. Concept and classification of physical work -- static and dynamic work, positive & negative work. Cardiovascular and respiratory changes during physical exercise. Brief idea of maximal aerobic power and excess post-exercise oxygen consumption.	PK	Jan
IV-A	06	5	Work Physiology	Basic idea of doping. EMG. Physical fitness index – Harvard step test. ECG -- normal waves and leads. Anthropometry and its uses.	PK	Jan

IV-A	06	6	Environmental Physiology	Environment - its physiological aspects. Effect of extreme temperature on humans. Hypobaric environment - effects on physiological system, acclimatization. Hyperbaric conditions and Caisson disease. Brief idea of cyanosis, dyspnoea, hyperpnoea, apnoea and asphyxia.	SM	Jan
IV-A	06	6	Environmental Physiology	Some common pollutants and their effects - carbon monoxide, lead and arsenic. Effects of noise on human body and preventive measures.	SM	Jan
IV-A	06	7	Biostatistics	Basic concepts – variable, population, parameter, sample, statistic. Classification of data – qualitative and quantitative, continuous and discontinuous.	SM	Dec
IV-A	06	7	Biostatistics	Presentation of data– frequency distribution, bar diagram, pie diagram, frequency polygon and histogram. Mean, median, mode, standard deviation and standard error.	SM	Dec

PART III GENERAL (1+1+1 SYSTEM) PRACTICAL

Paper	Unit	No. of Topic	Name of Topic	Topic	Teacher	Month
IV-B	07	1	A. Haematology	DC of WBC, estimation of haemoglobin, blood group determination, bleeding time and coagulation time.	SM	Nov
		1	B. Biochemistry	Identification of normal constituents of urine - chlorIde. sulphate, phosphate, creatinine and urea.	SM	Sep

				Identification of abnormal constituents of urine - glucose, protein, acetone blood and bile salts.		
		1	C. Human Experiments	a) Determination of Physical Fitness Index (PFI) of an individual by modified Harvard step test and recording of recovery heart-rate after standard exercise. b) Pneumographic recording of respiratory movements along with the effect of drinking of water, talking, forced hyperventilation and breath holding. c) Measurement of some common anthropometric parameters : stature, weight, eye height, shoulder height, elbow height. sitting height, elbow rest height (sitting), knee height (sitting), arm reach from wall, mid-arm circumference, waist circumference, hip circumference, neck circumference,head circumference, chest circumference. d) Calculation of Body Surface Area (using a nomogram) and Body Mass Index from anthropometric measurements.	SM	Dec

		2	Field Study Report	a) Diet survey of a family as per ICMR specification. b) Population study of physiological parameters such as height, weight, heart-rate, blood pressure, respiratory rate, PFI, TC of RBC, estimation of haemoglobin, DC of WBC as far as practicable.	SM	Jan
		3	Viva-Voce			
		4	Laboratory Note Books	Students will have to prepare separate note books on- i) Biochemistry, ii) Haematology, iii) Human Experiments and iv) Field study report	SM	

Department of Physiology

Academic Plan for Semester 1(CC1/GE1)

Vijaygarh Jyotish Ray College

Unit	Topic	Name of Teacher	Month
CC1/GE 1 Theory	1. **Cellular Basis of Physiology** Structure and functions of plasma membrane, nucleus and different cell organelles – Endoplasmic reticulum, Golgi bodies,Mitochondria, Lysosome and Peroxisome.	SM	Feb-May
	2. **Biophysical Principles, Enzymes and Chemistry of Bio-molecules** Physiological importance of the following physical processes: Diffusion , Osmosis and Surface tension. pH and Buffers – Significance in human body and maintenance of pH in the blood. Colloids - Classification and physiological importance. Enzymes: Classification, factors affecting enzyme action. Concept of coenzymes and isozymes. Carbohydrates **:** Definition and classification. *Monosaccharides* – Classification, structure, physiological importance. *Disaccharides* – Maltose, Lactose and Sucrose: Structure, occurrence and physiological importance. *Polysaccharides* – Starch, Glycogen, Dextrin, Cellulose. Lipids : Definition and classification. Fatty acids Classification. — Definition and importance of, Saponification number and, Iodine number.. Phospholipids, Cholesterol & its ester -- physiological importance. Amino acids, Peptides and Proteins**:** Classification and structure. Structure of peptide bonds. Nucleic acids:Structure of DNA and RNA.	SM	Jan-Feb
	3. **Digestion & Metabolism**: Structure in relation to functions of alimentary canal and digestive glands. Composition, functions and regulation of secretion of digestive juices including bile. Digestion and absorption of carbohydrate, protein and lipid. Movements of the stomach and small intestine. Glycolysis, TCA cycle, Importance of Glycogenesis, Glycogenolysis and. Gluconeogenesis. Beta oxidation of saturated fatty acid. Importance of Ketone bodies . Deamination & Transamination. Formation of urea .	SM	April-May

CC1/GE 1 Practical	1. Examination and staining of fresh tissues : Squamous, Ciliated and Columnar Epithelium by Methylene Blue stain	SM	March-May
	Qualitative tests for identification of : Glucose, Fructose, Lactose, Sucrose,		
	Starch, Dextrin, Lactic acid, Hydrochloric acid , Albumin, Acetone, Glycerol and		
	1. Examination and staining of fresh tissues : Squamous, Ciliated and Columnar Epithelium by Methylene Blue stain.		

Soma Majumder

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Dept. Of Physiology

Department of Physiology

Academic Plan for Semester 3 (CC3/GE3)

Vijaygarh Jyotish Ray College

Unit	Topic	Name of Teacher	Month
CC3/GE 3 Theory	1. **Nerve-muscle Physiology** Structure of neurons. Origin and propagation of nerve impulse. Velocity of impulse in different types of nerve fiber. Properties of nerve fibers: all or none law, rheobase and chronaxie, refractory period. indefatiguability. Synapses: structure, mechanism of synaptic transmission. Motor unit. Myoneural junction: structure, mechanism of impulse transmission. Degeneration and regeneration in nerve fibers. Different types of muscle and their structure. Red and white muscle. Muscular contraction: structural, mechanical and chemical changes in skeletal muscle during contraction and relaxation. Isotonic and isometric contractions. Properties of muscle: all or none law, beneficial effect, summation, refractory period, tetanus, fatigue.	SM	July-Aug
	2. **Nervous System:** A brief outline of organization and basic functions (sensory, motor and association) of the nervous system, central and peripheral nervous system. Ascending tracts carrying touch, kinaesthetic,temperature and pain sensations. Descending tracts: pyramidal tract and brief outline of the extra-pyramidal tracts. Reflex action - definition, reflex arc, classification, properties. Functions of the spinal cord. Outline of functions of brain stem. A brief idea of the structure, connections and functions of cerebellum. Different nuclei and functions of thalamus and hypothalamus. Cerebral cortex: histological structure and localization of functions. CSF : composition, formation, circulation and functions. A brief description of the organization of the autonomic (sympathetic and parasympathetic) nervous system. Functions of sympathetic and parasympathetic nervous system. A brief idea of speech, aphasia, conditioning, learning and memory.	SM	Sep-Oct
	3. **Special Senses** *Olfaction and Gustation:* Structure of sensory organ, neural pathway of olfactory and gustatory sensation. Mechanism of olfactory and gustatory sensation. Olfactory and gustatory adaptation. After-	SM	Oct-Nov

	taste. *Audition:* Structure of ear, auditory pathway, mechanism of hearing. *Vision:* Structure of the eye. Histology of retina. Visual pathway. Light reflex. Chemical changes in retina on exposure to light. Accommodation - mechanism. Errors of refraction.. Light and dark adaptation. Elementary idea of colour vision and colour blindness.		
CC3/GE 3 Practical	Silver Nitrate preparation of nodes of Ranvier. Silver nitrate preparation of corneal cell space. Examination and staining of skeletal and cardiac muscles by Methylene Blue stain. Silver Nitrate preparation of nodes of Ranvier.	SM	July-Nov

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PRACTICAL

Paper IV B (F.M. 30)

Unit – 07 : 30 Marks

1. Any two questions from the following three groups (A, B and C) are to be set in the examination:
9 x 2 = 18 marks

A. *Haematology:*

a) DC of WBC, estimation of haemoglobin, blood group determination, bleeding time and coagulation time.

Demonstration: Haematocrit, MCV, TC of RBC and WBC, ESR.

B. *Biochemistry:*

a) Identification of normal constituents of urine - chlorIde. sulphate, phosphate, creatinine and urea. Identification of abnormal constituents of urine - glucose, protein, acetone blood and bile salts.

Demonstration: Blood sugar estimation (Folin -Wu method)

C. *Human Experiments:*

a) Determination of Physical Fitness Index (PFI) of an individual by modified Harvard step test and recording of recovery heart-rate after standard exercise.

b) Pneumographic recording of respiratory movements along with the effect of drinking of water, talking, forced hyperventilation and breath holding.

c) Measurement of some common anthropometric parameters : stature, weight, eye height, shoulder height, elbow height. sitting height, elbow rest height (sitting), knee height (sitting), arm reach from wall, mid-arm circumference, waist circumference, hip circumference, neck circumference,head circumference, chest circumference.

d) Calculation of Body Surface Area (using a nomogram) and Body Mass Index from anthropometric measurements.

Demonstration:

a) Tests for colour blindness, test for visual acuity using Snellen's Chart. Exploration of conductive and perceptive deafness by tuning for method.

b) Ergographic recording of muscular fatigue by' Moss's ergograph. Clinical classification of reflexes : superficial reflex - planter reflex, Deep reflex – knee jerk, Visceral reflex - pupillary light reflex.

2. Field Study Report: **4 Marks**

Any one of the followings:

a) Diet survey of a family as per ICMR specification.

b) Population study of physiological parameters such as height, weight, heart-rate, blood pressure, respiratory rate, PFI, TC of RBC, estimation of haemoglobin, DC of WBC as far as practicable.

3. *Viva- Voce:* **5 Marks**

4. Laboratory Note- Book : **3 Marks**

Department : BOTANY

LEARNING MODULE FOR B.SC HONOURS

SEMISTER - I

Core course 1 Credit 4 (Theoritical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	beforeOutcome
Phycology	30	To know about the world of Lower Cryptogams comprising of ancient members of plant population.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector)	The students get clear idea about the Basic knowledge of Thalophyta specially algae which are the primary producers in aquatic ecosystems.
Microbiology	36	The students have been given information presented in a concise understable formation without excessive frills and diversion.	Do	on successful completion of this topic the students get clear idea about their microbial world, taxonomy, genetics, and their usefulness ..

Practical (BOT-A-CC-1-1-P) Credits 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Algae	13	To make the topic more interesting by taking practical class	Using compound and laminar airflow and autoclave.	they can see the structure to their own eyes and also get clear idea about the structure, technique for making slideand bacterial media preparation and sub culturing
Microbiology	13			

Core course 2 (Theoritical) credit 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	beforeOutcome
Mycology	30	The lectures have been made in such a way that a concise account of fungi to meet the requirement of Botany students.	Do	It deals with study of fungi specally their structure, reproduction, genetics. They are extremely important in iindustries such as cheese,wine, some of them are edible specially mushroom,some of them produce antibiotic. Many of them also harmful produce toxin
Phyto Pathology	30	This is a science which comprises both the art of treating the sick plant and the science of understanding the nature of the diseased plant. So the lectures are delivered in such a way that students will be interested to this topic.	Do	The students will know about the pathogen, disease concept in plants, some plant diseases, toxin and also disease control.

Practical (BOT-A-CC-1-2-P) credit 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Mycology	13	To make the topic more interesting by taking practical class	Using compound and simple microscope.	they can see the structure to their own eyes and also get clear idea about the structure, technique for making slide and also different plant diseases.
Phytopathology	13			

Semester III

Core course - 5 (BOT –A-CC-3-5-TH (Theoretical) Credit 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Before Outcome
Palaeobotany and Palynology	16	The purpose of this head is to stimulate the interest of students in paleobotany. However references to review articles and reference books are prescribed so that they can get clear idea of this topic.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector	This is the topic which deals recovery and identification of plants remains from past geological time, This helps us to see the relationships between different organisms and also their mode of evolution. Past vegetation and past climate ,environment can also be reconstructed by studying this subject.

Practical –Paleobotany and Palynology (BOT-A-CC-3-5-P) Credit 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Before Outcome
Palaeobotany and Palynology	4	The purpose of this head is to stimulate the interest of students in paleobotany. However references to review articles and reference books are prescribed so that they can get clear idea of this topic.	Simple and compound microscope	This is the topic which deals recovery and identification of plants remains from past geological time, This helps us to see the relationships between different organisms and also their mode of evolution. Past vegetation and past climate ,environment can also be reconstructed by studying this subject.

Core course -6 Reproductive biology of Angiosperms (BO/T-A-CC-3-6-TH) Theoretical Credit 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Morphology of Angiosperms	30	The lectures are delivered in such a way that the students get knowledge of different terminology, floral structure etc	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector	The y become interested in morphological aspect of Botany because it is the foundation of Botany
Embryology	30	The objectives of this topic is to give idea about basic developmental biology in simplest way..	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector do	The students can get idea about pollen, ovule , embryo, etc

Practical – Reproductive biology of angiosperm (BOT-A-CC-3-6-P) Credits 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Reproductive biology of angiosperm	15	It is the supplement of the theoritical class. So that they can overcome all the theoretical problem and will be interested of the topic	Simple and compound microscope .	They can be able to perform different biochemical tests, physiological experiments, to see different cellular structure, and different histochemical test and chemical test.

Core course -7 Plant systematic (BOT-A-CC-3-7-TH) Credit 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Taxonomy of Angiosperms	32	Introducing the students not only to the traditional aspects of plant taxonomy but also to the modern techniques and recent trends that forms the basis of good taxonomic practice and interpreting evolutionary relationship.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector	They know how the plants are arranged-classification, and also their mode of conservation and also plant biodiversity.

Practical – Plant Systematics (BOT-A-CC-3-7-P) Credits 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Angiosperms	25	It is a supplemet to the theoretical classroom. It helos the students to understand the subject more precisely.	Microscope – compound and simple	The students get clear idea about genus.

Department : BOTANY

LEARNING MODULE FOR B.SC HONOURS

YEAR : Part-I

PAPER: I (Theoritical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	beforeOutcome
Algae	20	To know about the world of Lower Cryptogams comprising of ancient members of plant population.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector)	The students get clear idea about the Basic knowledge of Thalophyta specially algae which are the primary producers in aquatic ecosystems.
Microbiology	20	The students have been given information presented in a concise understable formation without excessive frills and diversion.	Do	on successful completion of this topic the students get clear idea about their microbial world, taxonomy, genetics, and their usefulness ..
Fungi and Lichen	20	The lectures have been made in such a way that a concise account of fungi to meet the requirement of Botany students.	Do	It deals with study of fungi specally their structure, reproduction, genetics. They are extremely important in iindustries such as cheese,wine, some of them are edible specially mushroom,some of them produce antibiotic. Many of them also harmful produce toxin
Plant Pathology	20	This is a science which comprises both the art of treating the sick plant and the science of understanding the nature of the diseased plant. So the lectures are delivered in such a way that students will be interested to this topic.	Do	The students will know about the pathogen, disease concept in plants, some plant diseases, toxin and also disease control.

PAPER: IIA (Theoritical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Bryophytes	16	It is a small group of primitive thalloid plant with amphibious habit. A simple account of structure, reproduction, functions, relationship of important members of each class have been tried to present before students.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector)	This topic gives idea that they are pioneer of land plants. They have ecological significance as they initiate soil formation on barren land. Students get knowledge how they reproduce asexually and sexually. They have some economic importance.
Palaeobotany and Palynology	16	The purpose of this head is to stimulate the interest of students in paleobotany. However references to review articles and reference books are prescribed so that they can get clear idea of this topic.	do	This is the topic which deals recovery and identification of plants remains from past geological time, This helps us to see the relationships between different organisms and also their mode of evolution. Past vegetation and past climate ,environment can also be reconstructed by studying this subject.
Embryology	08	The objectives of this topic is to give idea about basic developmental biology in simplest way..	do	The students can get idea about pollen, ovule , embryo, etc

PAPER: IIB (Practical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Algae	13	To make the topic more interesting by taking practical class	Using compound and simple microscope.	they can see the structure to their own eyes and also get clear idea about the structure, technique for making slide.
Fungi and Lichen	13			
Bryophytes	5			

YEAR: Part-II

PAPER: III (Theoritical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Pteridophytes	20	To represent the lectures in a reasonably balanced and comprehensive way through the topic that are needed by the students.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector)	Students can get an idea anout first vascular plant, their structure, reproduction and also usefulness.
Gymnosperms	20	To deliver the lectures in such a way that students get knowledge about the past vegetation and evolution as they were the first seed plant.	Do	They can learn about fooils
Ecology and Plant Geography	20	Population and communities are continuously changing as a result of natural processes and human activities.So it is very much important to understand ecology.	Do	They get an idea about various ecosystems, distribution of flora and fauna, community ecology, population etc.
Anatomy	20	To represent the lecture in such way that they can get clear idea of cell,tissue and organ and different development.	Do	Students get an idea of internal structure of plant, changes the anatomical features in different ecological habitat.

PAPER: IVA (Theoritical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Morphology of Angiosperms	08	The lectures are delivered in such a way that the students get knowledge of different terminology, floral structure etc	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector	The y become interested in morphological aspect of Botany because it is the foundation of Botany
Taxonomy of Angiosperms	32	Introducing the students not only to the traditional aspects of plant taxonomy but also to the modern techniques and recent trends that forms the basis of good taxonomic practice and interpreting evolutionary relationship.	do	They know how the plants are arranged-classification, and also their mode of conservation and also plant biodiversity.

PAPER: IVB (Practical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Pteridophytes	12	It is a supplemet to the theoretical classroom. It helos the students to understand the subject more precisely.	Microscope – compound and simple	The students get clear idea about genus.
Angiosperms	12			
Gymnosperms				
Palaeobotany and Palynology	4			

YEAR: Part-III

PAPER: V (Theoritical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Biochemistry	28	The lectures have been delivered in such a manner that the teacher must include all the core information that we believe is essential for a good student undersanding the subject.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector.	They can learn about biochemical foundation, molecules of life , bioenergetics and enzymology and biomembrane.
Pharmacognosy	12	This is important branch of pharmacy which include the study of crude drugs and some natural product like secondary metabolite.	Do	The students may be interested to this particular topic so that they may take as special paper in their higher study .
Plant physiology	40	Plant physiology is not just an academic discipline but also a science with application important to our everyday life.The teacher introduce the students to this aspect of field showing them .	Do	They get an idea of different physiological pathway, about different hormone, stress physiology etc.

PAPER: VI (Theoritical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Cell Biology	16	The lectures are prepared in such a manner so that it stimulate students to think about the design of experiments and interpretation of experimental result.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector	They know about the cell, structure and function of different cell organelles, cloning and cell cycle.
Plant breeding and Biometry	12	Both are indispensible with the progress in various disciplines in life sciences.The different methods of Biostatistics has been exhaustively discussed with objectives, principles, merits and demerits.	Do	The y can get knowledge about plant selection, hybridization, hybrid seed production, mean, mode, median, Goodness of fit, etc
Plant Biotechnology	12	It has come to the forefront of scientific discipline simply because of tremendous development in Genetic Engineering on one hand and plant tissue culture on the other hand.	Do	They are getting knowledge about the latest technology that plant clones can be made artificially . Many medicinally important plant can be raised iby this technology.
Genetics and Molecular biology	40	it is the unifying science in biology covering all organisms in the universe, the analysis of chromosomes in the finest details from cellular to molecular level provide with an idea of idea of location and behavior of genetic material essential for the study of genetics.	Do	The students can get an idea of genes, chromosomes, replication, protein synthesis and several other interesting topics so that they can continue this aspect for higher study.

PAPER: VII (Practical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Biochemistry	12	It is the supplement of the theoritical class. So that they can overcome all the theoretical problem.	Simple and compound microscope, drawing prism, and different glass apparatus.	They can be able to perform different biochemical tests, physiological experiments, to see different cellular structure, and different histochemical test and chemical test.
Plant physiology	14			
Anatomy	8			
Pharmacognosy	5			

PAPER: VIII (Practical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Cell biology and Genetics	18	It is the supplement of the theoritical class. So that they can overcome all the theoretical problem.	Simple and compound microscope, drawing prism, and different glass apparatus.	They can be able to perform different biochemical tests, physiological experiments, to see different cellular structure, and different histochemical test and chemical test.
Biometry	6			
Microbiology	6			
Plant pathology	6			

ACADEMIC CALENDAR

2019 – 2020
C.U. B.Sc.
BOTANY (HONOURS)
SEMESTER I

Core course	**PHYCOLOGY AND MICROBIOLOGY (BOT-A-CC-1-1-TH)**	**THEORITICAL**	**Name of teachers**	**Credits 4**	**Lectures = 60**
1		**PHYCOLOGY**			
		1. General account : 1.1. Thallus organization, Structure of algal cell, 1.2. Ultrastructure of Plastids and Flagella, 1.3. Origin and evolution of sex, 1.4. Life cycle patterns, 1.5. Significant contributions of important phycologists (Fritsch, Smith, R. N. Singh, T.V. Desikachary, H.D. Kumar, M.O.P. Iyengar)	NK		5
		2. Classification: 2.1. Diagnostic characters and examples of Cyanophyceae, Rhodophyceae, Chlorophyceae, Charophyceae and Phaeophyceae	UR		5
		3. Cyanobacteria: 3.1. Ultrastructure of cell, 3.2. Heterocyst - structure and function, 3.3. Ecology	MB		4
		4. Bacillariophyta: 4.1. Cell structure, 4.2. Cell division, 4.3. Auxospore formation in Centrales and Pennales	MD		6
		5. Life History: 5.1. Chlamydomonas, 5.2. Oedogonium, 5.3. Chara, 5.4. Ectocarpus, 5.5. Polysiphonia, 5.6. Evolutionary significance of Prochloron	NK, UR, NK		10
		MICROBIOLOGY			
		1.Virus: 1.1. Discovery, 1.2.Plant virus- types, 1.3. Transmission and translocation of Plant virus, 1.4. TMV Physicochemical characteristics and Multiplication, 1.5. One step growth curve, 1.6. Lytic cycle (T4 phage) and Lysogenic cycle (Lambda phage), Significance of lysogeny, 1.7.Viroids and Prions.	MB and BB		10
		2.Bacteria: 2.1. Discovery, .2.2. Distinguishing features of Archaea and Bacteria, 2.3. Characteristics of some major groups: Proteobacteria (Enterobacteria), Firmicutes, Mollicutes, Actinobacteria, Spirochaetes, Chlamydiae, 2.4. Bacterial growth curve and generation time, 2.5.Flagella (ultrastructure) & Pilli, 2.6. Cell wall – chemical structure and differences between Gram +ve & Gram – ve bacteria, 2.7. Bacterial genome and plasmid, 2.8. Endospore - formation, structure and function, 2.9.Genetic Recombination (a) Transformation – with special emphasis on Natural and Induced competence and DNA uptake, (b) Conjugation─ F- factor, F + X F − , Hfr X F − , concept of F', chromosome mobilization, (c) Transduction– Generalised and specialized.	BB		20

	PHYCOLOGY AND MICROBIOLOGY (BOT-A-CC-1-1-P)	**PRACTICAL**		**Credits 2**	
		ALGAE 1. Work out of the following algae with reproductive structure (Free hand drawing and drawing under drawing prism with magnification): Oedogonium, Chara, Ectocarpus. 2. Study of (a) Permanent slides : Gloeotrichia, Volvox, Vaucheria, Coleochaete, Polysiphonia, Centric and Pennate diatom; (b) Macroscopic specimens : Laminaria, Sargassum.	UR and NK		
		MICROBIOLOGY 1. Preparation of bacterial media – (a) Nutrient agar and nutrient broth, (b) Preparation of slants and pouring Petri-plates. 8 2. Sub-culturing of bacterial culture. 3. Gram staining from bacterial culture. 4. Microscopic examination of bacteria from natural habitat (curd) by simple staining	MB		
		FIELD WORK At least one local excursion to be conducted for study and collection of algae (only 5 from natural habitat) and another local excursion should be conducted to give an introductory idea about plant diversity (Collection not required). **CLASSROOM PERFORMANCE** 1. Laboratory Note Book of each section must be signed by the respective teacher with date during practical classes. 2. Slides (permanent) prepared during practical classes. 3. Submission (5 algae collected from natural habitat and identified latter			

Core course	MYCOLOGY AND PHYTO-PATHOLOGY (BOT-A-CC-1-2-TH	THEORITICAL	Name of teachers	Credits 4	Lectures = 60
2					
		1. General Account: 1.1. Hyphal forms, 1.2. Fungal spore forms and mode of liberation, 1.3. Sexual reproduction and degeneration of sex, 1.4. Parasexuality and sexual compatibility, 1.5. Life cycle patterns	AC		6
		2. Classification: 2.1. Classification of Fungi (Ainsworth, 1973) upto sub-division with diagnostic characters and examples. 2.2. General characteristics of Myxomycota, Oomycota, Zygomycota, Ascomycota, Basidiomycota, Deuteromycota	MB		6
		3. Life history: 3.1. Synchytrium, 3.2. Rhizopus, 3.3. Ascobolus, 3.4. Agaricus.	AC		10
		4.Mycorrhiza: 4.1. Types with salient features, 4.2. Role in Agriculture & Forestry	AC		4
		5. Lichen: 5.1. Types, 6.2. Reproduction, 6.3. Economic and ecological importance	AC		4
		PHYTO-PATHOLOGY			
		1.Terms and Definitions : 1.1. Disease concept, 1.2. Symptoms, 1.3. Etiology & causal complex, 1.4. Primary and secondary inocula, 1.5. Infection, 1.6. Pathogenecity and pathogenesis, 1.7. Necrotroph and Biotroph, 1.8. Koch's Postulates, 1.9. Endemic, Epidemic, Pandemic and Sporadic disease, 1.10. Disease triangle, 1.11. Disease cycle (monocyclic, polycyclic and polyetic).	MB		6
		2. Host – Parasite Interaction: 2.1. Mechanism of infection (Brief idea about Pre-penetration, Penetration and Post-penetration), 2.2. Pathotoxin (Definition,criteria and example), 2.3. Defense mechanism with special reference to Phytoalexin, 2.4. Resistance- Systemic acquired and Induced systemic.	MD		6
		3. Plant Disease Management : 3.1. Quarantine, 3.2. Chemical, 3.3. Biological, 3.4. Integrated	BB		8
		4. Symptoms , Causal organism, Disease cycle and Control measures of: 4.1. Late blight of Potato, 4.2. Brown spot of rice, 4.3. Black stem rust of wheat, 4.4. Stem rot of jute.	BB		10
	MYCOLOGY AND PHYTO-PATHOLOGY (BOT-A-CC-1-2-P	**PRACTICAL**		**Credits-2**	
		MYCOLOGY 1. Work out of the following fungi with reproductive structures (including microscopic measurement of Reproductive structures): Rhizopus (asexual), Ascobolus, Agaricus . 2. Study from permanent slides: Zygospore of Rhizopus, Conidia of Fusarium, Conidiophore of 10 Penicillium. 3. Morphological study of Fungi (fruit body of Polyporus, Cyathus), Lichens (fruticose and foliose).	BB and AC		

		PHYTO- PATHOLOGY 1. Preparation of fungal media (PDA). 2. Sterilization process. 3. Isolation of pathogen from diseased leaf. 4. Inoculation of fruit and subculturing. 5. Identification : Pathological specimens of Brown spot of rice, Bacterial blight of rice , Loose smut of wheat, Stem rot of jute, Late blight of potato; Slides of uredial, telial, pycnial & aecial stages of Puccinia gramini	BB and AC		
		FIELD WORK At least one local excursion to be conducted for study and collection of macrofungi (only 5).			
		CLASSROOM PERFORMANCE 1. Laboratory Note Book of each section must be signed by the respective teacher with date during practical classes 2. Slides (permanent) prepared during practical classes. 3. Submission (5 Macro fungi			

ADEMIC CALENDAR
2019 – 2020
C.U. B.Sc.
BOTANY (HONOURS)
SEMESTER III

Core course 5	**PALAEOBOTANY AND PALYNOLOGY -BOTA-A-CC-3-5-TH**	**Theoretical**	**Name of teachers**	**Credits 4,**	**Lectures =60**
		PALAEOBOTANY & PALYNOLOGY 1. Geological time scale with dominant plant groups through ages.	**AC**		4
		2. Plant Fossil: 2.1. Types: Body fossil (Micro- and Megafossils), Trace fossil, Chemical fossil, Index fossil, 2.2. Different modes of preservation (Schopf, 1975), 2.3. Conditions favouring fossilization, 2.4. Nomenclature and Reconstruction, 2.5. Principle of fossil dating (a brief idea), 2.6.Importance of fossil study.	**AC/BB**		12
		3. Fossil Pteridophytes: Structural features, Geological distribution and Evolutionary significance of 3.1. Rhynia, 3.2. Lepidodendron (Reconstructed), 3.3. Calamites (Reconstructed).	**BB**		10
		4. Fossil gymnosperms: Structural features and Geological distribution of reconstructed genera: 4.1. Lyginopteris, 4.2.Williamsonia, 4.3.Cordaites	**UR**		10
		5. Indian Gondwana System - Three fold division with major megafossil assemblages	**MD**		6
		6. Palynology: 6.1. Spore and Pollen, 6.2. Pollen aperture types, 6.3. NPC classification (Erdtman). 6.4. Pollen wallSporopollenin, Stratification and Ornamentation (sculpturing)..	**MD**		10

		7.. Applied Palynology: Basic concepts of: 7.1. Palaeopalynology, 7.2. Aeropalynology, 7.3. Forensic palynology, 7.4.Melissopalynology	**MD**		8

Core course 5	PALAEOBOTANY AND PALYNOLOGY -BOTA-A-CC-3-5-P	PRACTICAL PALAEOBOTANY AND PALYNOLOGY	Name of teachers	Credits 2
		- PALAEOBOTANY AND PALYNOLOGY **1. Morphological study:** Ptilophyllum and Glossopteris leaf fossils**.** **2. Study from permanent slides:** T.S. of stem of Rhynia, Lepidodendron, Calamites, Lyginopteris,Cordaites. **3. Study of Pollen types** (colpate, porate and colporate) from permanent slides**.** Slides may be prepared from specimens: Colpate (Leonurus sibiricus/ Brassica sp.), Porate (Hibiscusrosa-sinensis), Colporate (Cassia sophera/ C. tora).	**NK/UR**	
		CLASSROOM PERFORMANCE **1.** Laboratory Note Book of each section must be signed by the respective teacher with date during practical classes		

CORE COURCE- 6
REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

Core course 6	REPRODUCTIVE BIOLOGY OF ANGIOSPERMS-BOT-A-CC-3-6-TH	THEORETICAL	Name of teachers	Credits 4,	Lectures =60
		MORPHOLOGY OF ANGIOSPERMS **1.** Inflorescence types with examples.	**UR**		**8**
		2. Flower, induction of flowering, flower development- genetic and molecular aspects**.**	**MD**		**14**
		3. Fruits and seeds - types with examples	**MD**		**8**
		EMBRYOLOGY 1. **Pre-fertilisation changes :** 1.1. Microsporogenesis and Microgametogenesis, 1.2. Megasporogenesis and Megagametogenesis (monosporic, bisporic and tetrasporic).	**NK**		**6**
		2. Fertilisation: 2.1. Pollen germination, 2.2. Pollen tube- growth, entry into ovule and discharge, 2.3. Double fertilization.	**NK**		**6**
		3.Post-fertilization changes : **3.1.** Embryogenesis in Capsella, 3.2. Development of Endosperm (3 types).	**NK**		**10**
		4. Apomixis & Polyembryony: 4.1. Apomixis- Apospory and Apogamy, 4.2.Polyembryony- different types.	**NK**		**8**

Core course 6	- REPRODUCTIVE BIOLOGY OF ANGIOSPERMS(BOTA-CC-3-6-P)	PRACTICAL	Name of teachers	Credits 2
		REPRODUCTIVE BIOLOGY OF ANGIOSPERMS **1.** Inflorescence types- study from fresh/ preserved specimens. 2. Flowers- study of different types from fresh/ preserved specimens. 3. Fruits- study from different types from fresh/preserved specimens. 4. Study of ovules (permanent slides/ specimens/photographs)- types (anatropous, orthotropous, amphitropous and campylotropous). 5. Field study desirable. 6. A project along supported with photographs taken during field study to be submitted giving comprehensive idea about different types of inflorescence, flowers and fruits **CLASSROOM PERFORMANCE** Same as above.	**MD/NK**	

CORE COURSE- 7
PLANT SYSTEMATICS

Core course 7	PLANT SYSTEMATICS (BOTT-A-CC-3-7-TH)	THEORETICAL	Name of teachers	Lectures 60	Credit4
		TAXONOMY OF ANGIOSPERMS **1. Introduction:** ***1.1.*** Components of Systematic: Nomenclature, Identification, Classification; ***1.2.*** Taxonomy and its phases - Pioneer, Consolidation, Biosystematic and Encyclopaedic; alpha- and omega- taxonomy.	**MD**	**6**	
		2. Nomenclature: Type method, Publication, Rank o f taxa, Rules of priority, Retention and rejection of names, Author Citation, Effective and valid publication, Elementary knowledge of ICN- Principles.	**MD**	**6**	
		3. Systems of classification: Broad outline of Bentham & Hooker (1862-1883), Cronquist (1988), Takhatajan (1991) - system of classification with merits and demerits. Brief reference of angiosperm phylogeny group (APG III) classification. ***3.1.*** Systematics in Practice: Herbaria and Botanical Gardens - their role in teaching and research; important Herbaria and Botanical Gardens of India and world (3 each); ***3.2.*** Dichotomous keys -indented and bracketed	**MD**	**20**	
		4. Phenetics and Cladistics: Brief idea on Phenetics, Numerical taxonomy- methods and significance; Cladistics- construction of dendrogram and primary analysis; Monophyletic, polyphyletic and paraphyletic groups; Plesiomorphy and apomorphy	**MD**	**8**	
		5. Data sources in Taxonomy: Supportive evidences from: ***5.1.*** Phytochemistry, ***5.2.*** Cytology, ***5.3.*** Palynology and ***5.4.*** Molecularbiology data (Protein and Nucleic acid homology).	**MD**	**8**	
		6. Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economicallyimportant plants (parts used and uses) of the following families: ***6.1.*** Monocotyledons: Alismataceae, Gramineae (Poaceae), Cyperaceae, Palmae (Arecaceae),Liliaceae, Musaceae, Zingiberaceae, Cannaceae, Orchidaceae. ***6.2.*** Dicotyledons: Nymphaeaceae, Magnoliaceae, Leguminosae (subfamilies), Polygonaceae ,Euphorbiaceae, Malvaceae, Umbelliferae (Apiaceae), Labiatae (Lamiaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Rubiaceae, Cucurbitaceae, Compositae (Asteraceae).	**MD**	**12**	

Core course 7	-Plant systematics (BOT-A-CC-3-7-P)	PRACTICAL - PLANT SYSTEMATICS -	Name of teachers	Credits 2
		ANGIOSPERMS **1.** Work out, description, preparation of floral formula and floral diagram, identification up to genuswith the help of suitable literature of wild plants and systematic position according to Benthum Hooker system of classification from the following families: Malvaceae, Fabaceae (Papilionaceae),Solanaceae, Scrophulariaceae, Acanthaceae, Labiatae (Lamiaceae) , Rubiaceae. **2.** Spot identification (Binomial, Family) of common wild plants from families included in the theoretical syllabus (list to be provided).	**MD**	
		FIELD WORK At least three excursions including one excursion to Acharya Jagadish Chandra Bose Indian Botanic Garden (Shibpur, Howrah) and Central National Herbarium (CNH).		
		FIELD RECORDS 1. Field Note Book (authenticated) with field notes on the plants of the area of excursion and voucher specimen book. **2.** Herbarium specimen: Preparation of 25 angiospermic specimens (identified with author citation, voucher number and arranged following Bentham& Hooker's system of classification)to be submitted during excursion.		
		CLASSROOM PERFORMANCE Same as above		

SEMESTER III (GENERAL)
CORE COURSE 3
CELL BIOLOGY, GENETICS AND MICROBIOLOGY-

Core course 3	CELL BIOLOGY, GENETICS AND MICROBIOLOGY-BOT -G--CC-3-3-TH	THEORETICAL	Name of teachers	Lectures 60	Credit4
		1Cell Biology and Genetics 1.1 Ultrastructure of nuclear envelope, nucleolus and their functions, 1.2 Molecular organisation of metaphase chromosome (Nucleosome concept) **2**. **Chromosomal aberrations-** 2.1 deletion, duplication, inversion & translocation, 2.2 Aneuploidy & Polyploidy-types, importance and role in evolution. **3. Central Dogma** 3.1 Transcription and Translation **4. Genetic Code**- properties. **5. Linkage group and Genetic map** (three-point test cross). **6. Mutation** – 6.1 Point mutation (tautomerisation; transition, transversion and frame shift), 6.2 Mutagen-physical and chemical . 7. Brief concept of Split gene, Transposons.		.6 6 10 4 6 8 4	
		Microbes 2.1 Viruses- Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance; 2.2 Bacteria- discovery,general characteristics and cell structure; reproduction- vegetative, asexual and recombination(conjugation, transformation and transduction); Economic		16	

		lmportance.			

- CELL BIOLOGY, GENETICS AND MICROBIOLOGY

Core course 3	BOT -G-BOT -G--CC-3-3-p	PRACTICAL	Name of teachers	(Credits 2)
		1. Cell Biology: Staining (Aceto-orcein) and squash preparation of onion root tip: study of mitotic stages Staining (Aceto-orcein) and squash preparation of onion root tip: study of mitotic stages. Determination of mitotic index (from onion root tip). **2. Microbiology:** Workout gram staining (curd/any natural source) **3. Identification with reasons:** Cytological slides of different mitotic and meiotic stages. Different forms of bacteria (*Coccus, Bacillus, Spiral*) **4. Laboratory Records:** Laboratory note books (regularly signed) and slides (prepared in class) are to be submitted at the time of Practical Examination. Regular attendance in the class must be credited.		

Academic calender BOTANY HONOURS 2019-2020 UNDER 1+1+1 SYSTEM (Theory)

YEAR	PAPER	TOPIC	MARKS	NAME OF TEACHER	JAN -DEC
PART III	V	BIOCHEMISTRY	35Marks (28 Periods)	AC and UR	1.Biochemical foundation 2. Molecules of life 3.Enzymology flow and enzymology 4.Cellmembrane and Biosignalling
	V	PHARMACOGNOSY	15 Marks (12 Periods)	MD	1. General account 2. Secondary metabolites 3. Pharmacologically active constituents
	V	PLANT PHYSIOLOGY	50 Marks (40 Periods)	UR and AC	1.Plant water relations 2.Organic Translocation 3.Photosynthesis 4.Respiration 5. Nitrogen metabolism 6. Plant Growth Regulators 7. Photomorphogenesis 8. Seed Dormancy 9. Physiology of Senescence and Agening 10. Stress Physiology
	VI	CELL BIOLOGY	20 Marks (16 Periods)	BB	1.Origin and Evolution of Cells 2.Nucleus and Chromosome 3. Cell Cycle and its regulation
	VI	PLANT BREEDING AND BIOMETRY	15 Marks (12 Periods)	BB	1. Plant Breeding 2. Biometry
		PLANT BIOTECHNOLOGY	15(Periods 12)	BB and NK	1.Plant tissue culture-introduction 2.Callus culture 3. Micropropagation 4. Haploid Culture 5. Protoplast Culture

					6. Plant genetic engineering

YEAR	PAPER	TOPIC	MARKS	NAME OF TEACHER	JAN -DEC
PART III	VI	GENETICS AND MOLECULAR BIOLOGY	50 Marks (40 Periods)	BB	1.Linkage crossing over and gene mapping 2. Epitasis and polygenic inheritance in plants 3.Aneuploidy and polyploidy 4. Chromosomal aberration 5.Mutation 6. Structural organization of gene 7. DNA replication, transcription and translation (prokaryotes and eukaryotes) 8. Generegulation 9. Genetic code 10. Recombinant DNA Technology 11. Bioinformatics

Name of the teacher: Dr. Samiparna Rakshit Dept. of History, LEARNING MODULE CC- 4 Sem.-II Subject: History (Hons)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
PAPER IV **SOCIAL FORMATIONS and CULTURAL PATTERNS OF THE MEDIEVAL WORLD OTHER THAN INDIA** **GROUP- B** **III. Crisis of the Roman Empire and its principal causes: Historiography**	To acquaint the students with various opinions of different schools of historians regarding crisis and decline of the Roman Empire. In spite of this the students would also be informed about the concept of Historiography.	6 3 3 3 2	1. Traditional way of teaching 2. Discussion of the topic 3. Question-answer method 4. Using of Virtual classes if required	The students would get the idea on the topics mentioned below: **A) Decay of the Roman Empire owing to General Malaise** 1. Edward Gibbon 2. Vegetius on military decline 3. Arnold Toyenbee 4. Michael Rostovtzeff 5. Joseph Tainter 6. Adrian Goldsworthy **B) Monocausal decay of the Roman Empire** 1. Disease 2. Environmental degradation 3. Lead poisoning **C) Catastrophic collapse** 1. J.B.Bury 2. Peter Heather 3. Bryan War Perkins **D) Transformation** 1. Henri Pirenne 2. Lucien Musset and the clash of civilization 3. The late antiquity **E) Any other historiographical views**

Signature of the Teacher :..... Current Year: ..... Signature of the Principal:.....

LEARNING MODULE

B.A. (HONS.) HISTORY

Semester – 1
TEACHER: DR. SAMIPARNA RAKSHIT

Paper : I : History of India From the earliest times to C 300 BCE

Topic:

CENTRAL INDIA AND THE DECCAN (CIRCA 1000 BCE-CIRCA 300 BCE)

No. of classes required:

10

Objective of the topic :

The objective of the topic is to enlighten the students with the settlement patterns, technological and economic developments, social stratification, political relations, religion and philosophy and the Aryan problem of Indian history within the period mentioned above

Strategy of teaching implemented :

Class lecture, Question-answer method, virtual class

Outcome :

a) The students would know about the different layers of economic development during 1000-300 BCE.
b) The class and the state not well established in later Vedic society.
c) Iron based agriculture and the formation of the Varna mechanism.
d) Sudras as peasants and proliferation of jatis.
e) Communication between the king and his subjects.
f) Propaganda for moral and social changes.
g) Crafts, commerce and communication.
h) Origin and use of astrology and divination.
i) Beliefs and practices typical of a rural milieu.
j) Plough cultivation and agricultural economy (C. 1000-600 BCE)
k) Iron-based production in crafts and agriculture (c. 600-322 BCE)

LEARNING MODULE

B.A. (HONS.) HISTORY

Semester – 1

Paper II: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD OTHER THAN INDIA

Topic:

a. **Bronze Age Civilizations -Egypt**

b. **Slave society in ancient Greece -Urbanization and Trade**

No. of classes required:

a. **10**

b. **6, 6**

Objective of the topic :

a. The students would get an idea of ancient Egypt as civilization of ancient North Africa.
b. The process of urbanization and the flourishing trading relations of the Ancient Greece is the topic on which the students will be enlightened.

Strategy of teaching implemented :

Class lecture, Question-answer method, virtual class

Outcome :

a) The students would get a vivid idea of ancient Egyptian civilization followed by pre-historic Egypt and coalesced around 3100 B.C.
b) The political unification of Upper and Lower Egypt under Menes.
c) The history of ancient Egypt occurred as a series of stable kingdoms, separated by periods of relative instability.
d) The main thrust of the knowledge of the students would be the Early Bronze Age, The Middle Kingdom of the Middle Bronze Age and the New Kingdoms of the Late Bronze Age.
e) The civilization of ancient Greece and its trade relations with the outer world.
f) Urban centers and its development is the other field of study.

LEARNING MODULE

B.A. (GENERAL) HISTORY

Semester – 1

PAPER 1: HISTORY OF INDIA FROM EARLIEST TIMES UPTO 300 CE

Topic:

a. A broad survey of paleolithic, Mesolithic and Neolithic cultures.

b. The Satavahana phase

c. The Sangam age

No. of classes required:

a. 4

b. 4

c. 4

Objective of the topic :

a. To provide the students with the idea of Stone Age of Ancient Indian history.
b. The detailed description of the administrative, economic, political and religion culture will be given to the students.
c. The vivid lecture would be given to students about Sangam literature, the three early kingdoms, Tamil language.

Strategy of teaching implemented :

Class lecture, Question-answer method

Outcome :

1. The stone age and its three chronological divisions namely Paleolithic, Mesolithic and Neolithic cultures and its traits.
2. The related culture PGW, Ochre Colored pottery, NBP etc. would be known to the students.
3. The students would get a detailed information about the different perspectives of the Satavahana age.
4. The students would get a detailed description of the Sangam age which is very much related to the ancient culture of the South India and is an important segment of study.

LEARNING MODULE

B.A. (HONS.) HISTORY

Semester – III
TEACHER: DR. SAMIPARNA RAKSHIT

PAPER 5 SEM-3: HISTORY OF INDIA III (CE 750-1206)

Topic:

IV Trade and Commerce

a. **Inter-regional trade**
b. **Maritime Trade**
c. **Forms of exchange**
d. **Process of urbanization**
e. **Merchant guilds of South India**

No. of classes required:

10

Objective of the topic :

The objective of the topic is to enlighten the students with the trade and commerce of Medieval India during the period 750 CE-1206 CE. Different trade relations will be discussed in detail.

Strategy of teaching implemented :

Class lecture, Question-answer method, virtual class

Outcome :

The students would have an idea of the medieval period, the middle classes who had been largely belonged to merchants and other professional classes. Among the merchant classes some specialized in wholesale trade and others in the retail trade. The wholesale traders were known as 'seth' or 'bohra' and the retail traders were known as 'beoparis' or 'banik'. The trading communities of medieval time in India was considerably large in number and included some of the richest merchants of India. Most long distance trade goods from within and beyond Europe, such as in amber, high quality ceramics, textiles, wines, furs, honey, walrus ivory.

LEARNING MODULE

B.A. (HONS.) HISTORY

Semester – III

PAPER 6 SEM- 3: RISE OF THE MODERN WEST-I

Topic:

IV. a) Reformation movements: Origins & courses
b.) Martin Luther & Lutheranism
c.) John Calvin & Calvinism
d.) Radical reformation: Anabapists and Huguenots
e.) English reformation and the role of the state

f.) Counter Reformation

No. of classes required:

a. **9**
b. **9**
c. **9**
d. **9**
e. **8**
f. **8**

Objective of the topic :

The students would understand the age of Transformation of Europe and its significance. The students would get the idea of the essence of 'Renaissance' and 'Reformation' which is also a new trend of Modern European history.

Strategy of teaching implemented :

Class lecture, Question-answer method, virtual class

Outcome :

The students would definitely get the detailed idea of the condition of Christianism and its utter necessity of Reformation. The Reformation movement and its origin and different courses is one

of the important topics in this segment. Martin Luther's ism about the reform of Christianism and how does it differ from John Calvin's opinion has also been taught. Contribution of Martin Luther and John Calvin towards the Reformation movement and their comparative study, is a significant portion related to this topic which has become interesting to the students. Anabaptists and Huguenots are two different prominent groups of 'Radical Reformation movement' that snatched students' interest more than the initial topics. 'Counter reformation' can be defined as a movement where the Catholics rose against the Protestants to restore their lost position and prestige in the Christian world, is the last important topic taught.

LEARNING MODULE

B.A. (HONS.) HISTORY

Semester – III

Paper 7 SEM-3: History of India (c.1206 – 1526)

Topic:

III. Society and Economy:

- **b. Agriculture production; technology**
- **c. Changes in rural society; revenue systems**
- **d. Monetization; market regulations; growth of urban centres; trade and commerce; Indian Ocean trade**

No. of classes required:

b. 9

c. 9

d. 9

Objective of the topic :

To provide the students with the interesting account of the products of India during the Sultanate period including fruits, flowers, herbs etc, the condition of the roads and the life of the period. The market regulation of the Sultanate period, growth of urban centers, trade and commerce, village economy and peasantry would also be the topics of discussion.

Strategy of teaching implemented :

Class lecture, Question-answer method, virtual class

Outcome :

The students get an idea that the soil was so fertile that it could produce two crops every year, rice being sown three times a year. Seasame, sugarcane and cotton were also grown. They formed the basis of many village industries, such as oil pressing, making of jaggery, weaving etc. Peasants formed the overwhelming majority of the population. The peasant continued to work hard. Still there were recurring famines and wars in different parts of the country and this added to the hardship of the peasants.

LEARNING MODULE

B.A. (GENERAL) HISTORY

Semester –III

CC-3/GE-3 : History of India from 1206 to1707

Topic:

VII. Akbar to Aurangzeb: administrative structure-Mansab & Jagirs, State &Religion, Socio-Religious Movements.

No. of classes required:

a. 4

b. 4

c. 4

Objective of the topic :

The aim is to enlighten mainly the students about the Mughal history of India. The main topics would be on Akbar and Aurangzeb and a comparative study on their policies.

Strategy of teaching implemented :

Class lecture, Question-answer method

Outcome :

The students would get a detailed information about the economic, administrative and religious policies of Akbar and Aurangzeb. In addition to the detailed information they would be provided with the concepts of tolerant religious policy of Akbar and a totally different religious policy of Aurangzeb or it would also be discussed whether the religious policy of Aurangzeb was really different or not in the context of recent historiographical discussions. The concept of Theocracy would also be discussed. Different economic endeavors of Akbar and Aurangzeb would also be discussed from different angles.

Name of the teacher: Dr. Samiparna Rakshit Dept. of History, LEARNING MODULE CC- 8 Sem.-II Subject: History (Hons)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
PAPER VIII **CC-8 : Rise of the Modern West – II** **IV. a.) Scientific Revolution** **b.) Emergence of scientific academies** **c.) Origins of Enlightenment**	To inform the students with the concepts of Scientific Revolution and enlightenment. To make them understand the drastic change in scientific thought that took place during 16th and 17th centuries. From this time onwards science became an autonomous discipline distinct from both philosophy and technology. Apart from this origin of Enlightenment in Modern west would also be taught to give them the idea that enlightenment has its primary origin in the scientific revolution.	4 3 4	1. Traditional way of teaching 2. Discussion of the topic 3. Question-answer method 4. Using of Virtual classes if required 5. Interactive classes	The students would get the vivid concepts of the scientific revolution which was series of events that marked the emergence of modern science during the early modern period, when developments in mathematics, physics, astronomy, biology and chemistry transformed the views of society about nature. The students would receive a clear picture of the relation between Enlightenment and Scientific Revolution and its association with its political revolutions and ideal, especially the French Revolution of 1789.

Signature of the Teache :..... Current Year: ..... Signature of the Principal:.....

Name of the teacher: Dr. Samiparna Rakshit Dept. of History, LEARNING MODULE CC- 3 Sem.-II Subject: History (Hons)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
PAPER III **HISTORY OF INDIA II (300 BCE to 750CE)** **IV Religion, Philosophy and society (circa 300 BCE -CE 750)** **a.Consolidation of the Brahmanical tradition : Dharma, Varnashram, Purushastras, Samskaras.** **b.Theistic cults (from circa second century BC): Mahayana; the Puranic tradition.**	To acquaint the students with the vast line of transformation of ancient Indian history within the time mentioned especially focusing on religion, society, philosophy.	4 3 3 3 3	1. Traditional way of teaching 2. Discussion of the topic 3. Question-answer method 4. Using of Virtual classes if required	The students would get the vivid concepts of changing forms of religion, social trends and philosophy of ancient India in the mentioned time frame. The students would receive a clear picture of the transformation of religious and social traits of ancient history of India.

Signature of the Teache :..... Current Year: ..... Signature of the Principal:.....

Name of the teacher: Dr. Samiparna Rakshit Dept. of History, LEARNING MODULE CC- 9 Sem.-IV Subject: History (Hons)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
CC-9 : History of India (c 1526 – 1605) **VI. Political and religious ideals:** **a)Inclusive political ideas: theory and practice** **b) Religious tolerance and Sulh-i-kul; Sufi mystical and intellectual interventions** **c)Pressure from the Ulama**	The students would be taught the basic ideals of Sulh-i kul and its origin from sufi mystic principle. The overall political and religious ideals of that time would also be taught.	4 4 4	1. Traditional way of teaching 2. Discussion of the topic 3. Question-answer method 4. Using of Virtual classes if required 5. Interactive classes	The students will understand properly that the meaning of Sulh i kul is "peace with all" or "universal peace" or "absolute peace" and the critical analysis of its reasons behind its introduction by the Mughal emperor Akbar. The sufi interpretations will also be an important part of their understanding. The students would imbibe a critical thought of analysing the political scenario and is close relation with the development of new religious ideals.

Signature of the Teache :..... Current Year: ..... Signature of the Principal:.....

Name of the teacher: Dr. Samiparna Rakshit Dept. of History, LEARNING MODULE CC- 10 Sem.-IV Subject: History (Hons)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
CC-10: History of India VI(c 1750s-1857) **V. TRADE and INDUSTRY** **a) Deindustrialization** **b) Trade and fiscal policy** **c) Drain of Wealth** **d) Growth of modern industry**	To acquaint the students with the critical analysis of adverse effect of British imperialism on traditional Indian economy. The idea of economic nationalism will also be discussed.	4 4 4 4	1. Traditional way of teaching 2. Discussion of the topic 3. Question-answer method 4. Using of Virtual classes if required 5. Interactive classes	The students would get the vivid concepts of changing economy that refers to a period of reduction in industrial based activities within the Indian economy from 1757 to 1947 under British colonialism. The Drain of wealth and growth of modern industry are the two related scenario of deindustrialization which will make them understand the adverse developments of trade and industry in colonial India in detail.

Signature of the Teache :..... Current Year: ..... Signature of the Principal:.....

Academic Plan for 3rd Year (Honours) History Part III

Department of History

Paper V: HISTORY OF EAST ASIA from 1839 to 1950 AD

UNIT I: CHINA (50 marks)- Angira Sen

UNIT II: JAPAN (50 marks)-Dr. Samiparna Rakshit

Paper VI: HISTORY OF INDIA 1750 to 1964 AD

UNIT I- From C1750 to 1885 AD (50 marks)-Sukla Bindu

UNIT II- From C 1885- 1964 AD (50 marks)-Sukla Bindu

Paper VII: HISTORY OF EUROPE from 1789 to 1919

UNIT I-(50 marks)-Sutapa Ghosh Thakur

UNIT II-(50 marks)-Dr. Samiparna Rakshit

Paper VIII: WORLD POLITICS in the 20th Century from 1919 to 2000 AD

UNIT I-(50 marks) Bishnupriya Bhattacharya

UNIT II-(50 marks) Bishnupriya Bhattacharya

LEARNING MODULE

B.A. (HONS.) HISTORY

Semester – 1
TEACHER: DR. SAMIPARNA RAKSHIT

Paper : I : History of India From the earliest times to C 300 BCE

Topic:

CENTRAL INDIA AND THE DECCAN (CIRCA 1000 BCE-CIRCA 300 BCE)

No. of classes required:

10

Objective of the topic :

The objective of the topic is to enlighten the students with the settlement patterns, technological and economic developments, social stratification, political relations, religion and philosophy and the Aryan problem of Indian history within the period mentioned above

Strategy of teaching implemented :

Class lecture, Question-answer method, virtual class

Outcome :

a) The students would know about the different layers of economic development during 1000-300 BCE.
b) The class and the state not well established in later Vedic society.
c) Iron based agriculture and the formation of the Varna mechanism.
d) Sudras as peasants and proliferation of jatis.
e) Communication between the king and his subjects.
f) Propaganda for moral and social changes.
g) Crafts, commerce and communication.
h) Origin and use of astrology and divination.
i) Beliefs and practices typical of a rural milieu.
j) Plough cultivation and agricultural economy (C. 1000-600 BCE)
k) Iron-based production in crafts and agriculture (c. 600-322 BCE)

Rajyasri Mitra

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

LEARNING MODULE

B.A. (HONS.) HISTORY

Semester – 1

Paper II: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD OTHER THAN INDIA

Topic:

a. **Bronze Age Civilizations -Egypt**

b. **Slave society in ancient Greece -Urbanization and Trade**

No. of classes required:

a. **10**

b. **6, 6**

Objective of the topic :

a. The students would get an idea of ancient Egypt as civilization of ancient North Africa.
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c) The history of ancient Egypt occurred as a series of stable kingdoms, separated by periods of relative instability.
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e) The civilization of ancient Greece and its trade relations with the outer world.
f) Urban centers and its development is the other field of study.

LEARNING MODULE

B.A. (GENERAL) HISTORY

Semester – 1

PAPER 1: HISTORY OF INDIA FROM EARLIEST TIMES UPTO 300 CE

Topic:

a. A broad survey of paleolithic, Mesolithic and Neolithic cultures.

b. The Satavahana phase

c. The Sangam age

No. of classes required:

a. 4

b. 4

c. 4

Objective of the topic :

a. To provide the students with the idea of Stone Age of Ancient Indian history.
b. The detailed description of the administrative, economic, political and religion culture will be given to the students.
c. The vivid lecture would be given to students about Sangam literature, the three early kingdoms, Tamil language.

Strategy of teaching implemented :

Class lecture, Question-answer method

Outcome :

1. The stone age and its three chronological divisions namely Paleolithic, Mesolithic and Neolithic cultures and its traits.
2. The related culture PGW, Ochre Colored pottery, NBP etc. would be known to the students.
3. The students would get a detailed information about the different perspectives of the Satavahana age.
4. The students would get a detailed description of the Sangam age which is very much related to the ancient culture of the South India and is an important segment of study.

Department of Chemistry
Name of Teacher : Dr Dasarath Mal
Learning Module: Semester-I (Hons)

Name Of Topic	Number Of Classes required	Objective Of theTopic	Teaching methods followed	Outcome
Atomic structure Extra nuclear Structure of atom	14	The study of Quantum numbers and their significance covers the general characteristics of multi - electronic atoms. The study Schrödinger' s wave equation covers the Radial and angular wave functions for hydrogen atom. At first Pauli's Exclusion Principle, Hund's rules and multiplicity, Exchange energy, Aufbau	1(i) First of all a clear lesson plan is made. (ii) In Lecture method mainly chalk and talk method is followed. (iv) To give a clear idea of the 3D structure of atoms **BALL & STICK** model is used. (v) To get more up to date knowledge on the subject we access Google.	1)(i) Quantum numbers will be helpful to understand electronic configuration Schrödinger 's wave equation will be helpful to understand the three dimensional concept of orbital and we get clear idea about Shapes of *s*, *p*, *d* and *f* orbitals. Study of Pauli's Exclusion Principle, Hund's rules and multiplicity, Exchange energy, Aufbau principle will be help

		principle is introduced.		full to write the systematics electronic configuratio n
Acid-Base reactions Lectures) Acid-Base concept:	6	At first different type of acid –base concept is discussed.	In Lecture method mainly chalk and talk method is followed.	Discussed topic finds huge application in daily life. These topics find application in material science. Solvent system theory is helpful to understand relative strength of acids and bases.
HSAB principle.	3	At first HSAB principle is clearly discussed.	Chalk and talk **BALL & STICK** model	HSAB principle will be helpful to predict mode various chemical reaction.

pH, buffer.Acid-base Neutralisation curves; indicator, choice of indicators.		Following terms are clearly introduced: pH, buffer. Acid-base Neutralisation curves; indicator, choice of indicators.		From pH value nature of the solution will be crystal clear.
Redox Reactions (14 Lectures) Ion-electron method of balancing equation of redox reaction.	4	At first Ion-electron method of balancing equation of redox reaction is discussed properly. Then Elementary idea on Standard redox potentials with sign conventions in traduced.	Chalk and talk	One gets the basic idea of ion electron method for balancing redox equation which find application in different field of chemistry

Nernst equation	4	General idea about Nernst equation (without derivation) is discussed. With the help of Nernst equation we can discuss Influence of complex formation, precipitation and change of pH on redox Potentials; formal potential.	Chalk and talk	Nernst equation will be helpful to predict mode various chemical reaction. Nernst equation will be helpful to understand feasibility of a redox titration,
Redox potential diagram (Latimer and Frost diagrams)	4	Preliminary idea of Latimer and Frost diagrams are given Then Feasibility of a redox titration is discussed.	Chalk and talk	Chemists can understand the feasibility of Disproporti onation and comproporti onation with the help of redox potential diagram.

Solubility and solubility effect – common ion effect	4	The term Solubility and solubility effect – common ion effect are discussed clearly and then their applications to the precipitation and separation of common metallic ions as hydroxides, sulfides, phosphates, carbonates, sulfates and halides are discussed.	Chalk and talk	solubility effect – common ion effect will be huge application in material chemistry.

Department of Chemistry
Name of Teacher : Dr Dasarath Mal
Learning Module: Semester-3 (Hons)

Part-I

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Chemical periodicity (15 Lectures) Modern IUPAC Periodic table, Effective nuclear charge, screening effects and penetration, Slater's rules,	7	At first Modern IUPAC Periodic table is introduced and then screening effects, penetration power of different orbital is discussed. Slater's rules for Effective nuclear charge calculation is clearly discussed. Studies lanthanide contraction. Relativistic Effect, Inert pair effect.	Chalk and Talk	Knowledge of screen effect and penetration power of orbital will be help full to understand some anomalous properties of the element. These topics find application in heavier p block and post lanthanide elements.
lanthanide contraction, Relativistic Effect, Inert pair effect	2			
Ionization potential, electron affinity and electronegativity (Pauling's, Mulliken's and Allred-Rochow's scales)	5	Ionization potential, electron affinity and electronegativity (Pauling's, Mulliken's and Allred-Rochow's scales) and factors influencing these properties, group electronegativities.		The concept IP, EA and EN will be help to to understand chemical bonding.

Chemistry of *s* and *p* Block Elements (30 Lectures) Relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation	8	At first, relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Then concept of Allotropy and catenation.is discussed.	Chalk and Talk	Concept of catenation will be help full to understand bonding of organic molecules.
.Basic beryllium acetate . borates, boron nitrides, borohydrides .	5	Berief idea of Basic beryllium acetateis introduced. Then structure, bonding, preparation, properties and uses.Beryllium hydrides and (diborane) and graphitic compounds, silanes, Oxides and oxoacids of nitrogen, phosphorus, sulphur and chlorine.Peroxo acids of sulphur, sulphur-nitrogen compounds is discussed.	Chalk and Talk	This topics have very importance for synthetic inorganic chemists.
interhalogen compounds,		interhalogen compounds, polyhalide ions,		Concept of interhalogen and

polyhalide ions, pseudohalogens, fluorocarbons and basic properties of halogens.	4	pseudohalogens, fluorocarbons and basic properties of halogens are discussed thoroughly.		polyhalides will be help full in the study environmental science.
Noble Gases: Inorganic Polymers: Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones and siloxanes.Borazines, silicates and phosphazenes.	4	Occurrence and uses, rationalization of inertness of noble gases, Clathrates; preparation and properties of XeF_2, XeF_4 and XeF_6; Nature of bonding in noble gas compounds (Valence bond treatment and MO treatment for XeF_2 and XeF_4). Xenon-oxygen compounds. Molecular shapes of noble gas compounds (VSEPR theory) is discussed clearly.	Chalk and Talk	Find application in material sciences.
Coordination Chemistry-I (15 Lectures)	8	At first simple idea of Coordinate bonding: double and complex salts is introduced. Then Werner's theory of coordination complexes, Classification of ligands, Ambidentate ligands, chelates, Coordination numbers, are discussed thoroughly.	Chalk and Talk	Find application in in magnetic chemistry. Coordination compound find huge application to control environment pollution.

Department of Bengali

ডিসেম্বর – ২ – ২০১৯ ড. মৃণাল বীরবংশী

বিষয়	আবশ্যিক উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
মঙ্গল কাব্যের উদ্ভব ও বিকাশ মনসামঙ্গল, চণ্ডীমঙ্গল, ধর্মমঙ্গল ও অন্নদামঙ্গল প্রসঙ্গ পাঠ্যাংশ – মনসার অসীম ক্ষমতা কথা, সওদাগর চরিত্র ও কমলাকান্ত উপাখ্যান	মঙ্গলকাব্য সম্পর্কে ছাত্র-ছাত্রীদের ধারণা তৈরী, বিভিন্ন কবি ও তাদের কাব্য সম্পর্কে পরিচয় দান করা। অনুবাদ সাহিত্যের ক্রমবিকাশ কবিদের পরিচয় দান ও তাদের কাব্যের বৈচিত্র্য সম্পর্কে ধারণা দেওয়া	১৮	তাত্ত্বানুগতিক পদ্ধতি এবং কার্যকুশলি কিছু কিছু সময় পাঠ করে আলোচনা।	মধ্যযুগের সাহিত্য সম্পর্কে ছাত্র-ছাত্রীদের জ্ঞান লাভ, বাংলা সাহিত্যের তিনটি ভিন্ন ধারা সম্পর্কে পরিচিত হওয়া, মঙ্গলকাব্য, পদাবলী-পাঁচালী, কাব্যগুলি — এই তিনটি সাহিত্য ধারা সম্পর্কে জ্ঞান লাভ করা।
ভাষাতত্ত্ব ধ্বনি, বর্ণ, অক্ষর, উচ্চারণস্থান ও উচ্চারণপ্রকৃতি অনুযায়ী বাংলা স্বর ও ব্যঞ্জন ধ্বনিগুলির পরিচয়, বাংলা ধ্বনি পরিবর্তন	ভাষা বিজ্ঞান বা ভাষাতত্ত্ব সম্পর্কে ছাত্র-ছাত্রীদের জ্ঞান-অর্জন। এছাড়া বাংলা ধ্বনি পরিবর্তনের পরিচিতি লাভ।	৮	তাত্ত্বানুগতিক পদ্ধতি এবং আলোচনা ভিত্তিক পদ্ধতি	ভাষাতত্ত্ব সম্পর্কে ছাত্র-ছাত্রীদের জ্ঞান লাভ, স্বরধ্বনি উচ্চারণ ও প্রকৃতি সম্পর্কে ও সচেতন হবে, ভাষা বিষয়ক সমস্যা সমাধানে জ্ঞান অর্জন।

সেমেস্টার – ৩ ·

ড. ভূপাল বীর২০শী

বিষয়	আবিকা উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্ক্ষিত ফল
কাব্য কবিতা – রবীন্দ্রনাথ ঠাকুর সত্যেন্দ্রনাথ দত্ত, যতীন্দ্রনাথ সেনগুপ্ত মোহিতলাল মজুমদার, জসীমউদ্দীন ইসলাম, বুদ্ধদেব বসু, অন্যান্য আধুনিক কবিগণ	আধুনিক যুগের কবিদের কাব্য ও কবিতা সম্পর্কে ধারণা হোয়া এছাড়াও কবি পরিচিতি লাভ,	১৮	গতানুগতিক পদ্ধতি, এছাড়াও উল্লিখিত কবিদের কিছু কিছু কবিতা পাঠ ও বিশ্লেষণ,	ছাত্র-ছাত্রীরা আধুনিক যুগের কবিদের সঙ্গে পরিচিত হবে, এছাড়াও বিভিন্ন কবির নিজস্ব ভঙ্গি সম্পর্কে ধারণা লাভ করবে
ভাষা বিজ্ঞান শুদ্ধ-অশুদ্ধ বাংলা প্রয়োগ প্রমাণভিত্তিক লক্ষ্য – অক্ষয়চন্দ্র সরকার আধুনিক বাংলা প্রয়োগ প্রমাণভিত্তিক লক্ষ্য – পরিবর্তনশীল (ভাষা বিজ্ঞানভিত্তিক)	শুদ্ধ-অশুদ্ধ ও আধুনিক বাংলা প্রয়োগ প্রমাণভিত্তিক লক্ষ্য সম্পর্কে ধারণা হোয়া	২০	প্রমাণভিত্তিক পদ্ধতি ছাড়াও উদাহরণের সহযোগে আলোচনা ও পার্থক্য নির্দেশ,	শুদ্ধ-অশুদ্ধ ভাষার বাংলা প্রয়োগ সম্পর্কে ছাত্র-ছাত্রীদের ধারণা লাভ, এছাড়া আধুনিক বাংলা প্রয়োগের সঙ্গে পার্থক্য তুলি ও প্রদর্শন করবে,
উপন্যাস পদ্মানদীর মাঝি – মানিক বন্দ্যোপাধ্যায়, অরণ্যের অধিকার — মহাশ্বেতা দেবী	মানিক বন্দ্যোপাধ্যায়ের উপন্যাস সম্পর্কে ধারণা হোয়া এবং আঞ্চলিক উপন্যাসের বৈশিষ্ট্য নির্ধারণ, মহাশ্বেতা দেবীর উপন্যাসের বৈশিষ্ট্য ও মূল্য বিচার সম্পর্কে ধারণা	১২	উপন্যাস পাঠ, আলোচনা সমালোচনা ও প্রশ্ন উত্তরের মধ্য দিয়ে উপন্যাসের পরিচয় দান,	মানিক বন্দ্যোপাধ্যায়ের উপন্যাসে বৈশিষ্ট্য ও বৈচিত্র্য সম্পর্কে ধারণা লাভ হবে, মহাশ্বেতা দেবীর উপন্যাসের বৈচিত্র্যতা ও মূল্য বিচারের সুযোগ সম্পর্কে ধারণা লাভ,

বিষয়	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
পঞ্চমপত্র কৃষির গঠন ও সামাজিক পরিবর্তন ১। কৃষি বিস্তার, শস্য ২। জমিদার ও কৃষক ৩। বর্ণ ব্যবস্থার প্রসার, অস্পৃশ্যদের অবস্থিতি ৪। বর্ণ ব্যবস্থার ক্ষেত্রে কৃষকরূপে উপজাতি বর্গ	১ ২ ২ ২	আলোচ্য বিষয়গুলি পঠনপাঠনের সাধারণ উদ্দেশ্য হল ছাত্র-ছাত্রীদের প্রাকমধ্যযুগের ভারতবর্ষে কৃষিব্যবস্থার গঠন প্রকৃতি এবং এর সহিত জড়িত জমিদার, কৃষকদের অবস্থান । এছাড়া সেই যুগের বর্ণ ব্যবস্থা ও অস্পৃশ্য ও উপজাতিদের অবস্থান ও কার্যাবলী ।	বোর্ডের ম্যাপের সাহায্যে, বিতর্কমূলক আলোচনা পদ্ধতি ও প্রশ্নোত্তর পর্ব	আলোচ্য বিষয়গুলি পঠনপাঠনের পর ছাত্র-ছাত্রীরা ভারতবর্ষের প্রাকমধ্যযুগে অর্থনীতি ও সমাজব্যবস্থার উদ্ভব, প্রসার ও বিস্তার বিষয়ে একটি পরিষ্কার ধারণা লাভ করতে সক্ষম হল। এই ধারণা তাদের পরবর্তী ইতিহাসের ধারা অনুসরণ করতে সাহায্য করবে ।
ষষ্ঠপত্র ১) জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার ২) ইউরোপে রাজ্য ব্যবস্থার উত্থান	৩ ৩	আলোচ্য বিষয়গুলি পঠনপাঠনের মাধ্যমে ছাত্র-ছাত্রীরা আধুনিক পাশ্চাত্য দেশে জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার কিভাবে হয়েছিল এবং তার পরবর্তী কালে ইউরোপে রাজ্যগুলির উত্থান কিভাবে হয়েছিল সে বিষয়ে অবগত হতে পারবে ।	বোর্ডে লেখার মাধ্যমে প্রশ্নোত্তর পর্ব বিতর্কমূলক পদ্ধতিতে	আলোচ্য বিষয়গুলি পঠনপাঠনের মাধ্যমে ছাত্র-ছাত্রীরা পাশ্চাত্য দেশগুলিতে জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার সম্বন্ধে পরিষ্কার ধারণা গ্রহণ করতে পারবে । এছাড়া ইউরোপে রাজ্য ব্যবস্থার উত্থান ও বিকাশ বিষয়ে জ্ঞান অর্জনের ফলস্বরূপ এরা পরবর্তী যুগের ইতিহাস সম্বন্ধে জানতে উৎসাহিত বোধ করবে ।

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

বিষয়	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
পঞ্চমপত্র কৃষিরগঠন ও সামাজিক পরিবর্তন ১। কৃষি বিস্তার, শস্য ২। জমিদার ও কৃষক ৩। বর্ণ ব্যবস্থার পর সার, অস্পৃশ্যদের অবস্থিতি ৪। বর্ণ ব্যবস্থার ক্ষেত্রে কৃষকরূপে উপজাতি বর্গ	১ ২ ২ ২	আলোচ্য বিষয়গুলি পঠনপাঠনের সাধারণ উদ্দেশ্য হল ছাত্র-ছাত্রীদের প্রাকমধ্যযুগের ভারতবর্ষে কৃষিব্যবস্থার সহিত জড়িত জমিদার, কৃষকদের অবস্থান । এছাড়া সেই যুগের বর্ণ ব্যবস্থা ও অস্পৃশ্য ও উপজাতিদের অবস্থান ও কার্যাবলী ।	বোর্ডের ম্যাপের সাহায্যে, বিতর্কমূলক আলোচনা পদ্ধতি ও প্রশ্নোত্তর পর্ব	আলোচ্য বিষয়গুলি পঠনপাঠনের পর ছাত্র-ছাত্রীরা ভারতবর্ষের প্রাকমধ্যযুগে অর্থনীতি ও সমাজব্যবস্থার উদ্ভব, প্রসার ও বিস্তার বিষয়ে ছাত্র-ছাত্রীরা একটি পরিষ্কার ধারণা লাভ করতে সক্ষম হল। এই ধারণা তাদের পরবর্তী ইতিহাসের ধারা অনুসরণ করতে সাহায্য করবে ।
ষষ্ঠপত্র ১) জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার ২) ইউরোপে রাজ্য ব্যবস্থার উত্থান	৩ ৩	আলোচ্য বিষয়গুলি পঠনপাঠনের মাধ্যমে ছাত্র-ছাত্রীরা আধুনিক পাশ্চাত্য দেশে জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার কিভাবে হয়েছিল এবং তার পরবর্তী কালেই উরোপে রাজ্যগুলির উত্থান কিভাবে হয়েছিল সে বিষয়ে অবগত হতে পারবে মধ্যযুগে।	বোর্ডে লেখার মাধ্যমে প্রশ্নোত্তর পর্ব বিতর্কমূলক পদ্ধতিতে	আলোচ্য বিষয়গুলি পঠনপাঠনের মাধ্যমে ছাত্র-ছাত্রীরা পাশ্চাত্য দেশগুলিতে জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার সম্বন্ধে পরিষ্কার ধারণা গ্রহণ করতে পারবে । এছাড়া ইউরোপে রাজ্য ব্যবস্থার উত্থান ও বিকাশ বিষয়ে জ্ঞান অর্জনের ফলস্বরূপ এরা পরবর্তী যুগের ইতিহাস সম্বন্ধে জানতে উৎসাহিত বোধ করবে ।

শিক্ষিকার স্বাক্ষর :

অধ্যক্ষা :

বিষয়	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
সপ্তম পত্র **দিল্লী সুলতানী সম্বন্ধে আলোচনা :** ক) দিল্লী সুলতানীর রাজনৈতিক ইতিহাস : ১। ভিত্তি, প্রসার ও দিল্লী সুলতানীর প্রতিষ্ঠা, খলজী, তুঘলক, মোঙ্গল নেতা তৈমুরলঙের আক্রমন, সৈয়দ বংশের উত্থান ও পতন, লোদী বংশ, বহলুল ও সিকন্দর শাহের বিজয়, ইব্রাহিম লোদী এবং পানিপথের যুদ্ধ । খ) রাজতন্ত্র সম্বন্ধে ধারণা, অভিজাত শাসক শ্রেণী, সুফি, উলেমা ও তাদের রাজনৈতিক একাধিপত্য, রাজকীয় সৌধ এবং মুদ্রা ।	১ ৯	আলোচ্য বিষয়গুলি পঠনপাঠনের সাধারণ উদ্দেশ্য হল ছাত্র-ছাত্রীদের দিল্লী সুলতানীর রাজনৈতিক ইতিহাস সম্বন্ধে বিস্তারিত জ্ঞান যাতে আহরণ করতে পারে সে বিষয়ে যথাযথ সচেতন থাকতে হবে ।	বোর্ডে লেখার মাধ্যমে, পাওয়ার পয়েন্ট প্রেজেন্টেশান এর মাধ্যমে, প্রশ্নোত্তর পর্ব ও বিতর্ক মূলক পদ্ধতিতে পড়ানো হবে ।	দিল্লী সুলতানীর রাজনৈতিক ইতিহাস পড়ে ছাত্র-ছাত্রীরা ভারতবর্ষে কিভাবে রাজপুতদের ক্ষমতা থেকে বিতাড়িত করে মুসলমান শাসন প্রতিষ্ঠিত হল তা অবগত হবে ও তাদের রাজনৈতিক ইতিহাসের গতিপ্রকৃতি সম্বন্ধে ছাত্র-ছাত্রীদের ধারণা পরিষ্কার হবে ।

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

Name of the Teacher : Sutapa Ghosh Thakur **Dept. of History** **LEARNING MODULE** **CC-1** **Sem.-I** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
CC - I **Cultures in Tradition** Settlement patterns, technological and Economic development; social stratification; political relations; religion and philosophy; the Aryan problem. a) North India (C. 1500 B.C.E – 300 B.C.E)	To provide students with an overview of early Indian History by utilising innovative teaching methods with unique teaching aids.	7	Chalk and Talk Power Point Presentation	The students will be able to comprehend the events of early Indian History and will get a clear concept of the impact of different emerging civilisations on the history of India. The seven lectures provided in this paper will be enough to establish a strong realisation of the said historical age which will in turn enable them to carry out further research on the same.
CC-II **Agriculture and animal husbandry.**	To provide students with an overview of agriculture and animal husbandry. Farmers have a deep understanding and connection to nature. The purpose of farming is to deprive other spices of the land and sequester it for our own use. Animal husbandry is a branch of agriculture concerned with the domestication of care for and breeding of animals such as dogs, cattle, horses, sheep etc.	6	Chalk and Talk Power Point Presentation	The Students Will Be Able To comprehend that agriculture was an important influence in the creation of trade and money.... the backbone of civilisation today. They will learn that farming is critical to all aspects of society. The students will be able to learn that animal husbandry began in the Neolithic revolution around 10,000 years ago. Though domestication of animals was probably common earlier, it is certain that goats and sheep were domesticated throughout Asia by 8000 B.C.E.

Signature of the Teacher: PRINCIPAL

Name of the Teacher: Sutapa Ghosh Thakur **Dept. of History** **LEARNING MODULE** **CC-5** **Sem.-III** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
Module –III Agrarian Structure and Social Change 1) Agrarian expansion; crops 2) Landlords and peasants 3) Proliferation of castes: status of untouchables. 4) Tribes as peasants and their place in the varna order.	To provide students with the concept of agrarian expansion, nature and economy, concepts and different types of agricultural practices and their evaluation along with linkage and association of agricultural practices with castes and infrastructure.	2 3 2 2	Chalk and talk Chalk and talk Chalk and talk Chalk and talk	Students will be able To Conceptualise The nature of agricultural evolution in the history of India which led to social changes and protocols established era and their gradual modifications and up gradations along with dynamicity of agricultural and social traditions.

Signature of the Teacher :

PRINCIPAL

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
Module – VI **Rise of the Modern West**				Students will be able to visualised and conceptualise the meaning of national monarchy and how it has been modified with due course of time to adopt itself with changing scenario. National monarchy is now sub-divided into three types of monarchies, namely – absolute, constitutional and sub-national.
1. Development of the Monarchy.	To provide students a comprehensive idea of National Monarchy, which is still prevailing in some of the Western countries like U.K., Vatican City, and France etc.	2	Chalk and Talk, Power Point Presentation	
2. Emergence of European State System.	To provide students an idea of European state system and also make them understand the necessity of emergence of such system.	3	Chalk and Talk, Power Point Presentation	After first world war European national monarchy in which queen / king of England was the absolute decision maker of almost all the European countries started to lose its power and the necessity of an alternative system, in which the power had to be equally divided among all the European countries, was felt and thus the European state system evolved.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher: Sutapa Ghosh Thakur **Dept. of History** **LEARNING MODULE** **CC-7** **Sem.-3** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
Module – I **Interpreting the Delhi Sultanate** 1. **Survey of Sources** : Persian Tarikh Tradition, Vernacular Histories, Epigraphy	1. To provide students with comprehensive overview of the early sultanate period.	9	Chalk and talk with map pointing	Students will be able to visualise and conceptualise the history of the said era and will be able to understand dissemination of the sultanate throughout the country by geo-locating their strategic expansions. Their concepts and knowledge on the evaluation of Islamic history of India will be reinforced. Students will develop an interest in the topic which will encourage then to take up more research activities in this area. The interactive sessions will allow them to realise new avenues in the history of that period and they will be able to analyse strategical, economic and political concepts of their age.
Module – II A. Foundation, expansion and consolidation of the sultanate of Delhi, the Khaljis and the Tughluqs, Mongol threat and Timur`s invasion; rise and fall of Syed Dynasty; conquest of Bahlul and Sikandar; Ibrahim Lodi and the battle of Panipath	2. To imbue within the students the nature and the concept of socio-economic aspects and political scenario in that era and strategies.	4	Chalk and talk with map pointing	
B. Theories of kingship, ruling Elites, Sufis, Ulema and the political authority; monuments and coinage.			Chalk and talk with map pointing	

Signature of the Teacher :

PRINCIPAL

Name of the Teacher: Sutapa Ghosh Thakur **Dept. of History** **LEARNING MODULE** **CC-1 Sem.-I** History (General) Paper-I
History (General) [Hons.] Paper-III

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
Paper-I **History of India from earliest Times upto 300 C.E** **I.** Sources and interpretation	(1) To Provide Students The Literary Source And Archaeological Source of History of India From Earliest Times Up to 300 C.E.	2	Chalk and talk	Students will be able to know about the different sources of such as literary and archaeological, from which we come earliest times to 300 C.E. and also how different historians have analysed them.
VII Jainism and Buddhism, Causes, Doctrines, Spread, Decline and Contribution	(2) To provide students an indepth studies of Jainism and Buddhism, causes of their emergence, doctrines, spread, decline and their respective contribution in the Indian history.	5	Chalk and talk	students will also have an idea of how Jainism and Buddhism have emerged their doctrines and how these two religions has spread in India and What was the reason of their decline and they contributed in Indian history.
Paper –III **History of India from 1206 - 1707** **VIII.** Economy, Society and culture under the Mughals.	(1) To make students understand the economical, social and cultural aspects which were prevalent during the Mughal period and to	6	Chalk and talk	Students will get a clear picture of the region of the Mughal empire. The different aspects which contributed to the success of the Mughal Empire will be now evident to the students. They will be able to understand the social and cultural scenario during the Mughal period, its drawbacks and advantages. They will be able to analyse the limitations of the Empire as to how and why the Maratha Power emerged during Mughal period which will help them in understanding the concept of history at later chronological period.
IX. Emergence of Maratha Power	them analyse the cause of emergence of the Maratha power through a series of presentations, lectures and interaction sessions.	2	Chalk and talk	

Signature of the Teacher :

PRINCIPAL

শিক্ষিকার নাম : গার্গী ভট্টাচার্য্য **(LEARNING MODULE)** লার্নিং মডিউল **বিভাগ :শিক্ষাবিজ্ঞান** CC-1 & 2 সেমিষ্টার - ১ **শিক্ষাবিজ্ঞান (সাম্মা**

বিষয় (CC-1)	সাধারণউদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
একক - ১ (CC-1) **ভারতীয় সংবিধানের দায়িত্ব এবং কর্তব্য -** নাগরিকদের গণতান্ত্রিক এবং মৌলিক কর্তব্য । শিক্ষার ধারণা, অর্থ, লক্ষ্য, প্রকৃতি, পরিধি, ডেলরস কমিশন ।	নাগরিক হিসাবে তাদের কর্তব্য সম্পর্কে অবগত হবে । নাগরিক হিসাবে তাদের অধিকার সম্পর্কে ধারণা লাভ করবে । শিক্ষার অর্থ, প্রকৃতি, পরিধি, সম্পর্কে অবগত হবে । ডেলরস কমিশনের মতে আধুনিক শিক্ষার লক্ষ্য কি তা জানা সম্ভব হবে ।	৬ ৬	দলগত ও বিতর্কমূলক আলোচনা গতানুগতিক বক্তৃতা প্রশ্ন উত্তর	এটা একনায়কতন্ত্র নিবারণ করে বা সরকারের মধ্যস্থতা করে । মানুষের ব্যক্তিত্বের বিকাশ ঘটায় । সংখ্যা গরিষ্ঠদের কাছ থেকে সংখ্যা লঘুদের অধিকার দিয়ে তাদের রক্ষা করে । বিভিন্ন বয়স, জাতি, ধর্ম, বর্ণ নির্বিশেষে সকলকে ভালো শিক্ষা প্রদান করে । এই পদ্ধতির মাধ্যমে জ্ঞান, মূল্যবোধ, দক্ষতা, বিশ্বাস ও নৈতিক অভ্যাসের মান উন্নয়ন সম্ভব হয় ।
একক - ২ (CC-2) **ব্রিটিশ আমলে শিক্ষাব্যবস্থা (১৮০০ - ১৮৫৩) :** শ্রীরামপুর ত্রয়ী, এবং তাদের অবদান, প্রাচ্য-পাশ্চাত্য দ্বন্দ্ব, মেকলে মিনিট, এডামের রিপোর্ট।	ব্রিটিশ আমলে ভারতীয় শিক্ষার বিকাশ সম্পর্কে জানা যাবে । শিক্ষাক্ষেত্রে শ্রীরামপুর ত্রয়ীর অবদান সম্পর্কে অবগত হবে । ব্রিটিশ আমলে শিক্ষা সম্পর্কে সচেতন হবে ।	৬	গতানুগতিক, প্রশ্ন উত্তর দলগত আলোচনা	সনদ আইনের মাধ্যমে ভারতীয়দের শিক্ষার বিকাশ ঘটিয়েছে । প্রাচ্য শিক্ষার চেয়ে পাশ্চাত্য শিক্ষার ক্ষেত্রে বেশী অর্থ বরাদ্দের কথা বলা হয়েছে । ইংরেজী এবং ফার্সী ভাষাকে সরকারী ভাষা হিসাবে গণ্য করা হয়েছে ।

শিক্ষিকার স্বাক্ষর : গার্গী ভট্টাচার্য

অধ্যক্ষা :

বিষয়	সাধারণ উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
একক - ১ (CC-5) সামাজিক শিক্ষাবিজ্ঞান সম্পর্কে ধারণা, অর্থ, সংজ্ঞা, সম্পর্ক, পরিধি ।	সমাজবিজ্ঞান ও শিক্ষাবিজ্ঞান সম্পর্কে ধারণা লাভ করবে । সামাজিক শিক্ষাবিজ্ঞানের প্রকৃতি পরিধি ব্যাখ্যা করা হবে । সামাজিক পরিবেশ সম্পর্কে জানা যাবে ।	৬	বক্তৃতা মূলক পারস্পরিক ক্রিয়া	সামাজিক শিক্ষাবিজ্ঞান প্রত্যেক ব্যক্তিকে সাহায্য করে কিভাবে মানুষ, সমাজ ও সামাজিক পদ্ধতি কাজ করে তা জানতে । সমাজ শিক্ষাবিজ্ঞান প্রত্যেক ব্যক্তি তথা সমাজের ধর্ম, সংস্কৃতি, ভাষা এবং শিক্ষাকে প্রভাবিত করে । আধুনিক শিক্ষামূলক সমাজ ব্যবস্থায় জনসংযোগমূলক শিক্ষা প্রতিষ্ঠান তথা উচ্চ শিক্ষা এবং অবিরাম শিক্ষা সম্বন্ধে সচেতন করে ।
একক -৩ (CC-6) শিক্ষামূলক পরিচালন অর্থ, উদ্দেশ্য , প্রকারভেদ ও গুরুত্ব ।	শিক্ষামূলক পরিচালনার কাজ সম্পর্কে জানা যাবে । শিক্ষামূলক পরিচালনায় ধারণা, প্রসার ভেদ সম্পর্কে শিক্ষার্থী বুঝতে সমর্থ হবে । এর উদ্দেশ্য এবং গুরুত্ব ব্যাখ্যা করা হবে ।	১০	বক্তৃতা , দলগত আলোচনা, প্রশ্ন উত্তর	শিক্ষামূলক পরিচালনা বিভিন্ন পরিচালনা মূলক বিজ্ঞান তত্ত্বকে সংযুক্ত করেছে যা শিক্ষামূলক পরিচালক এবং পরিচালনামূলক দলগত বিকাশে গুরুত্বপূর্ণ দায়িত্ব সম্পর্কে সংজ্ঞায়িত ও বিশ্লেষায়িত করেছে । শিক্ষামূলক পরিচালন সিদ্ধান্ত নিতে, সমস্যা সমাধান করতে, যোগাযোগ এবং পরিচালনার তথ্যসমূহ জানতে সাহায্য করে । সহপাঠক্রমিক কার্যবলী পরিচালনা, সময়সূচী নির্ধারণ ইত্যাদিতে সাহায্য করে ।
একক -১ (CC-7) নির্দেশনার অর্থ, কাজ, প্রয়োজনীয়তা, ব্যক্তিগত নির্দেশনা, মাধ্যমিক বিদ্যালয়ের জন্য প্রয়োজনীয় নির্দেশনা ।	নির্দেশনার ধারণা সম্পর্কে অবগত হবে । নির্দেশনার সুবিধা অসুবিধা সম্পর্কে জানা যাবে । আদর্শ বিদ্যালয় নির্দেশনার ব্যবস্থা এবং প্রয়োজনীয়তা সম্পর্কে জানা যাবে ।	৮	বক্তৃতা পদ্ধতি বর্ণনামূলক	আদর্শ পরিচালনা সমবেত করে কিন্তু তরুণমনদের প্রয়োজন নির্দেশনা বা তার ব্যক্তিত্বকে পালিশ করে । শিক্ষার্থীরা বিদ্যালয় জীবনের বিভিন্ন পরিস্থিতিকে কি ভাবে তত্ত্বাবধান করতে সে সম্পর্কে পরামর্শ দেওয়া । নির্দেশনা শিক্ষার্থীদের আচরণ গঠন করে, শৃঙ্খলিত করে, সঠিক নির্দেশনা শিক্ষার্থীদের লক্ষ্য পূরণে সাহায্য করে ।

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

Name of the Teacher : Gargi Bhattacharjee **Dept. of Education** **LEARNING MODULE** CC-1 **Sem.-I** Education (Hons.)

Unit	Topic	Objectives	Classes required	Strategy and Methodology	Outcome
1	**(CC-1)** **Concept of Education –** Meaning, aims, nature & scope Delor's Commission	To understand the meaning nature, scope and aims of Education. To know about the aims of modern education with special reference to Delor's Commission.	6	1) Traditional lecture. 2) Question – Answer.	It facilitates quality learning all through the life among people of any age, group, caste, religion and region. It is the process of achieving knowledge values, skills, beliefs and moral habits.
2	**(CC-2)** **Education in India during the British period (1800 -1853) –** Sreerampore Trio & their contribution, Charter Act, Orientation – Occidental controversy, Macaulay Minute, Adams report.	To be acquainted with the development of education in British India. To know the contribution of Sreermpore Trio in the field of education. To become aware the British period.	6	1) Traditional lecture. 2) Question – Answer.	Charter act was first instance that British East India Company acknowledged of education in India. English education gets more fund as compare to oriental learning English become court language and Persian was abolished as court language.

Signature of the Teacher : Gargi Bhattacharjee PRINCIPAL

Name of the Teacher : Gargi Bhattacharjee **Dept. of Education** **LEARNING MODULE** CC-5 & 6 **Sem.-III** Education (Hons.)

Unit	Topic	Objectives	Classes required	Strategy and Methodology	Outcome
1	**(CC-5)** **Introductory concept of Sociology of Education** - Meaning, Definition, Relation, Nature or scope of Sociology of Education.	To understand the relation between sociology and education. To Explain the concept of nature and scope of Sociology in Education. To know about Social Environment.	6	Lecture, Discussion, Interactive Method	Sociology of education helps the individual to understand human society and how social system work. Sociology focuses on the impact of religion, culture, race, Language and education on the individuals as well as the society. It is mostly concerned with the public schooling system of modern Indus- trial societies including the expansion of higher, adult and continuing education.
3	**(CC-6)** **Educational Management** - Meaning of educational management, objectives of educational management, Types of Educational management, significance of Educational management.	To know the essential functions of educational management. To enable the students to understand the concept and types of educational management. To explain its objectives and significance.	10	Lecture, Group discussion, Question – Answer.	It includes the study of various theories of management science which define and describes the roles and responsibilities of the educational manager and develop managerial skills. Helps in discussion making and problem-solving, communication and managing information and building effective terms. Helps in planning of Co-Curricular activities, academic and preparation of time – table.

Signature of the Teacher : Gargi Bhattacharjee

PRINCIPAL

Name of the Teacher : Gargi Bhattacharya **Dept. of Education** **LEARNING MODULE** **CC-7** Sem.-III Education (Hons.)

Unit	Topic	Objectives	Classes required	Strategy and Methodology	Outcome
1	**(CC- 7)** **Guidance –** Meaning, functions need – Individual Guidance, Group Guidance, Need for guidance in Secondary School.	To know the concept of guidance. To understand the advantage and disadvantage of guidance. To be acquainted with need and requisite of a good school guidance programme	8	Interactive Lecture Question-answer	Good conduct is converted but young minds need guidance to polish their personality. The students are advised on how to cap with different situations they tend to face in their school life. It shapes students behaviour and also enough discipline in them. Proper guidance helps them to achieve their goals.

Signature of the Teacher : Gargi Bhattacharjee

PRINCIPAL

Name of the Teacher : Sutapa Ghosh Thakur **Dept. of History** **LEARNING MODULE** **CC-1** **Sem.-I** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
CC - I **Cultures in Tradition** Settlement patterns, technological and Economic development; social stratification; political relations; religion and philosophy; the Aryan problem. a) North India (C. 1500 B.C.E – 300 B.C.E)	To provide students with an overview of early Indian History by utilising innovative teaching methods with unique teaching aids.	7	Chalk and Talk Power Point Presentation	The students will be able to comprehend the events of early Indian History and will get a clear concept of the impact of different emerging civilisations on the history of India. The seven lectures provided in this paper will be enough to establish a strong realisation of the said historical age which will in turn enable them to carry out further research on the same.
CC-II **Agriculture and animal husbandry.**	To provide students with an overview of agriculture and animal husbandry. Farmers have a deep understanding and connection to nature. The purpose of farming is to deprive other spices of the land and sequester it for our own use. Animal husbandry is a branch of agriculture concerned with the domestication of care for and breeding of animals such as dogs, cattle, horses, sheep etc.	6	Chalk and Talk Power Point Presentation	The Students Will Be Able To comprehend that agriculture was an important influence in the creation of trade and money.... the backbone of civilisation today. They will learn that farming is critical to all aspects of society. The students will be able to learn that animal husbandry began in the Neolithic revolution around 10,000 years ago. Though domestication of animals was probably common earlier, it is certain that goats and sheep were domesticated throughout Asia by 8000 B.C.E.

Signature of the Teacher: Sutapa Ghosh Thakur

PRINCIPAL

Name of the Teacher: Sutapa Ghosh Thakur **Dept. of History** **LEARNING MODULE** **CC-5** **Sem.-III** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
Module –III Agrarian Structure and Social Change 1) Agrarian expansion; crops 2) Landlords and peasants 3) Proliferation of castes: status of untouchables. 4) Tribes as peasants and their place in the varna order.	To provide students with the concept of agrarian expansion, nature and economy, concepts and different types of agricultural practices and their evaluation along with linkage and association of agricultural practices with castes and infrastructure.	2 3 2 2	Chalk and talk Chalk and talk Chalk and talk Chalk and talk	Students will be able To Conceptualise The nature of agricultural evolution in the history of India which led to social changes and protocols established era and their gradual modifications and up gradations along with dynamicity of agricultural and social traditions.

Signature of the Teacher :

PRINCIPAL

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
Module – VI **Rise of the Modern West**				Students will be able to visualised and conceptualise the meaning of national monarchy and how it has been modified with due course of time to adopt itself with changing scenario. National monarchy is now sub-divided into three types of monarchies, namely – absolute, constitutional and sub-national.
1. Development of the Monarchy.	To provide students a comprehensive idea of National Monarchy, which is still prevailing in some of the Western countries like U.K., Vatican City, and France etc.	2	Chalk and Talk, Power Point Presentation	
2. Emergence of European State System.	To provide students an idea of European state system and also make them understand the necessity of emergence of such system.	3	Chalk and Talk, Power Point Presentation	After first world war European national monarchy in which queen / king of England was the absolute decision maker of almost all the European countries started to lose its power and the necessity of an alternative system, in which the power had to be equally divided among all the European countries, was felt and thus the European state system evolved.

Signature of the Teacher : Sutapa Ghosh Thakur

PRINCIPAL

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
Module – I **Interpreting the Delhi Sultanate** 1. **Survey of Sources** : Persian Tarikh Tradition, Vernacular Histories, Epigraphy **Module – II** A. Foundation, expansion and consolidation of the sultanate of Delhi, the Khaljis and the Tughluqs, Mongol threat and Timur's invasion; rise and fall of Syed Dynasty; conquest of Bahlul and Sikandar; Ibrahim Lodi and the battle of Panipath B. Theories of kingship, ruling Elites, Sufis, Ulema and the political authority; monuments and coinage.	1. To provide students with comprehensive overview of the early sultanate period. 2. To imbue within the students the nature and the concept of socio-economic aspects and political scenario in that era and strategies.	9 4	Chalk and talk with map pointing Chalk and talk with map pointing Chalk and talk with map pointing	Students will be able to visualise and conceptualise the history of the said era and will be able to understand dissemination of the sultanate throughout the country by geo-locating their strategic expansions. Their concepts and knowledge on the evaluation of Islamic history of India will be reinforced. Students will develop an interest in the topic which will encourage then to take up more research activities in this area. The interactive sessions will allow them to realise new avenues in the history of that period and they will be able to analyse strategical, economic and political concepts of their age.

Signature of the Teacher :

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Topic	Objectives	Classes required	Strategy and Methodology	Outcome
Paper-I **History of India from earliest Times upto 300 C.E** **I.** Sources and interpretation	(1) To Provide Students The Literary Source And Archaeological Source of History of India From Earliest Times Up to 300 C.E.	2	Chalk and talk	Students will be able to know about the different sources of such as literary and archaeological, from which we come earliest times to 300 C.E. and also how different historians have analysed them.
VII Jainism and Buddhism, Causes, Doctrines, Spread, Decline and Contribution	(2) To provide students an indepth studies of Jainism and Buddhism, causes of their emergence, doctrines, spread, decline and their respective contribution in the Indian history.	5	Chalk and talk	students will also have an idea of how Jainism and Buddhism have emerged their doctrines and how these two religions has spread in India and What was the reason of their decline and they contributed in Indian history.
Paper –III **History of India from 1206 - 1707** **VIII.** Economy, Society and culture under the Mughals.	(1) To make students understand the economical, social and cultural aspects which were prevalent during the Mughal period and to them analyse the cause of emergence of the Maratha power through a series of presentations, lectures and interaction sessions.	6	Chalk and talk	Students will get a clear picture of the region of the Mughal empire. The different aspects which contributed to the success of the Mughal Empire will be now evident to the students. They will be able to understand the social and cultural scenario during the Mughal period, its drawbacks and advantages. They will be able to analyse the limitations of the Empire as to how and why the Maratha Power emerged during Mughal period which will help them in understanding the concept of history at later chronological period.
IX. Emergence of Maratha Power		2	Chalk and talk	

Signature of the Teacher : Sutapa Ghosh Thakur

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বিষয়	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
পঞ্চমপত্র কৃষির গঠন ও সামাজিক পরিবর্তন ১। কৃষি বিস্তার, শস্য ২। জমিদার ও কৃষক ৩। বর্ণ ব্যবস্থার প্রসার, অস্পৃশ্যদের অবস্থিতি ৪। বর্ণ ব্যবস্থার ক্ষেত্রে কৃষকরূপে উপজাতি বর্গ	১ ২ ২ ২	আলোচ্য বিষয়গুলি পঠনপাঠনের সাধারণ উদ্দেশ্য হল ছাত্র-ছাত্রীদের প্রাকমধ্যযুগের ভারতবর্ষে কৃষিব্যবস্থার গঠন প্রকৃতি এবং এর সহিত জড়িত জমিদার, কৃষকদের অবস্থান । এছাড়া সেই যুগের বর্ণ ব্যবস্থা ও অস্পৃশ্য ও উপজাতিদের অবস্থান ও কার্যাবলী ।	বোর্ডের ম্যাপের সাহায্যে, বিতর্কমূলক আলোচনা পদ্ধতি ও প্রশ্নোত্তর পর্ব	আলোচ্য বিষয়গুলি পঠনপাঠনের পর ছাত্র-ছাত্রীরা ভারতবর্ষের প্রাকমধ্যযুগে অর্থনীতি ও সমাজব্যবস্থার উদ্ভব, প্রসার ও বিস্তার বিষয়ে একটি পরিষ্কার ধারণা লাভ করতে সক্ষম হল। এই ধারণা তাদের পরবর্তী ইতিহাসের ধারা অনুসরণ করতে সাহায্য করবে ।
ষষ্ঠপত্র ১) জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার ২) ইউরোপে রাজ্য ব্যবস্থার উত্থান	৩ ৩	আলোচ্য বিষয়গুলি পঠনপাঠনের মাধ্যমে ছাত্র-ছাত্রীরা আধুনিক পাশ্চাত্য দেশে জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার কিভাবে হয়েছিল এবং তার পরবর্তী কালে ইউরোপে রাজ্যগুলির উত্থান কিভাবে হয়েছিল সে বিষয়ে অবগত হতে পারবে ।	বোর্ডে লেখার মাধ্যমে প্রশ্নোত্তর পর্ব বিতর্কমূলক পদ্ধতিতে	আলোচ্য বিষয়গুলি পঠনপাঠনের মাধ্যমে ছাত্র-ছাত্রীরা পাশ্চাত্য দেশগুলিতে জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার সম্বন্ধে পরিষ্কার ধারণা গ্রহণ করতে পারবে । এছাড়া ইউরোপে রাজ্য ব্যবস্থার উত্থান ও বিকাশ বিষয়ে জ্ঞান অর্জনের ফলস্বরূপ এরা পরবর্তী যুগের ইতিহাস সম্বন্ধে জানতে উৎসাহিত বোধ করবে ।

শিক্ষিকার স্বাক্ষর :

অধ্যক্ষা :

শিক্ষিকার নাম : সুতপা ঘোষ ঠাকুর **(LEARNING MODULE)** লার্নিং মডিউল **ইতিহাস বিভাগ** **সেমিষ্টার - ৩** ইতিহাস (সাম্মানিক)

বিষয়	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
পঞ্চমপত্র কৃষিরগঠন ও সামাজিক পরিবর্তন ১। কৃষি বিস্তার, শস্য ২। জমিদার ও কৃষক ৩। বর্ণ ব্যবস্থার পর সার, অস্পৃশ্যদের অবস্থিতি ৪। বর্ণ ব্যবস্থার ক্ষেত্রে কৃষকরূপে উপজাতি বর্গ	১ ২ ২ ২	আলোচ্য বিষয়গুলি পঠনপাঠনের সাধারণ উদ্দেশ্য হল ছাত্র-ছাত্রীদের প্রাকমধ্যযুগের ভারতবর্ষে কৃষিব্যবস্থার সহিত জড়িত জমিদার, কৃষকদের অবস্থান । এছাড়া সেই যুগের বর্ণ ব্যবস্থা ও অস্পৃশ্য ও উপজাতিদের অবস্থান ও কার্যাবলী ।	বোর্ডের ম্যাপের সাহায্যে, বিতর্কমূলক আলোচনা পদ্ধতি ও প্রশ্নোত্তর পর্ব	আলোচ্য বিষয়গুলি পঠনপাঠনের পর ছাত্র-ছাত্রীরা ভারতবর্ষের প্রাকমধ্যযুগে অর্থনীতি ও সমাজব্যবস্থার উদ্ভব, প্রসার ও বিস্তার বিষয়ে ছাত্র-ছাত্রীরা একটি পরিষ্কার ধারণা লাভ করতে সক্ষম হল। এই ধারণা তাদের পরবর্তী ইতিহাসের ধারা অনুসরণ করতে সাহায্য করবে ।
ষষ্ঠপত্র ১) জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার ২) ইউরোপে রাজ্য ব্যবস্থার উত্থান	৩ ৩	আলোচ্য বিষয়গুলি পঠনপাঠনের মাধ্যমে ছাত্র-ছাত্রীরা আধুনিক পাশ্চাত্য দেশে জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার কিভাবে হয়েছিল এবং তার পরবর্তী কালেই উরোপে রাজ্যগুলির উত্থান কিভাবে হয়েছিল সে বিষয়ে অবগত হতে পারবে মধ্যযুগে।	বোর্ডে লেখার মাধ্যমে প্রশ্নোত্তর পর্ব বিতর্কমূলক পদ্ধতিতে	আলোচ্য বিষয়গুলি পঠনপাঠনের মাধ্যমে ছাত্র-ছাত্রীরা পাশ্চাত্য দেশগুলিতে জাতীয় রাজতন্ত্রের উদ্ভব ও প্রসার সম্বন্ধে পরিষ্কার ধারণা গ্রহণ করতে পারবে । এছাড়া ইউরোপে রাজ্য ব্যবস্থার উত্থান ও বিকাশ বিষয়ে জ্ঞান অর্জনের ফলস্বরূপ এরা পরবর্তী যুগের ইতিহাস সম্বন্ধে জানতে উৎসাহিত বোধ করবে ।

শিক্ষিকার স্বাক্ষর : সুতপা ঘোষ ঠাকুর

অধ্যক্ষা :

বিষয়	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
সপ্তম পত্র **দিল্লী সুলতানী সম্বন্ধে আলোচনা :** ক) দিল্লী সুলতানীর রাজনৈতিক ইতিহাস : ১। ভিত্তি, প্রসার ও দিল্লী সুলতানীর প্রতিষ্ঠা, খলজী, তুঘলক, মোঙ্গল নেতা তৈমুরলঙের আক্রমন, সৈয়দ বংশের উত্থান ও পতন, লোদী বংশ, বহলুল ও সিকন্দর শাহের বিজয়, ইব্রাহিম লোদী এবং পানিপথের যুদ্ধ । খ) রাজতন্ত্র সম্বন্ধে ধারণা, অভিজাত শাসক শ্রেণী, সুফি, উলেমা ও তাদের রাজনৈতিক একাধিপত্য, রাজকীয় সৌধ এবং মুদ্রা ।	১ ৯	আলোচ্য বিষয়গুলি পঠনপাঠনের সাধারণ উদ্দেশ্য হল ছাত্র-ছাত্রীদের দিল্লী সুলতানীর রাজনৈতিক ইতিহাস সম্বন্ধে বিস্তারিত জ্ঞান যাতে আহরণ করতে পারে সে বিষয়ে যথাযথ সচেতন থাকতে হবে ।	বোর্ডে লেখার মাধ্যমে, পাওয়ার পয়েন্ট প্রেজেন্টেশান এর মাধ্যমে, প্রশ্নোত্তর পর্ব ও বিতর্ক মূলক পদ্ধতিতে পড়ানো হবে ।	দিল্লী সুলতানীর রাজনৈতিক ইতিহাস পড়ে ছাত্র-ছাত্রীরা ভারতবর্ষে কিভাবে রাজপুতদের ক্ষমতা থেকে বিতাড়িত করে মুসলমান শাসন প্রতিষ্টিত হল তা অবগত হবে ও তাদের রাজনৈতিক ইতিহাসের গতিপ্রকৃতি সম্বন্ধে ছাত্র-ছাত্রীদের ধারণা পরিষ্কার হবে ।

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

LEARNING MODULE FOR B.Sc. HONS

SUBJECT- PHYSICS

Semester - 2: Electricity and Magnetism

Electricity and Magnetism (Theory)

Credits: 4

Paper: PHS-A-CC-2-3-TH

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Electrostatic Field	12	Basic idea of electrostatic field, potential of any charge distribution is discussed. Then various aspects of electrostatic field and potential are discussed followed by determination of electrostatic field and potential of few symmetric charge distribution by employing various method like Gauss's theorem, method of image charge etc.	Chalk and Talk	Discussed topics find application in condensed matter physics, nuclear physics, and modern physics and so on.
Dielectric properties of matter	6	Idea of electric dipole is introduced followed by discussion of dielectric properties of matter.	Chalk and Talk	Discussed topic finds huge application in condensed matter physics.
The Magnetostatic Field	10	First the idea of magnetic force is introduced followed by the calculation of magnetic field of few steady current distributions. Then vector aspects of magnetic field induction are discussed followed by introduction of magnetic vector potential.	Chalk and Talk	Underlying ideas form the basic building blocks of classical and quantum field theory.
Magnetic properties of matter	6	First the idea of magnetic dipole is introduced and then field and potential of magnetic dipole is calculated. Then magnetic properties of matter are discussed.	Chalk and Talk	These topics find application in condensed matter physics and material science.
Electromagnetic induction	6	Laws of electromagnetic induction are discussed. Then ideas and calculations of self and mutual induction are discussed. Then Maxwell's equations are	Chalk and Talk	The discussed ideas form the basic of electromagnetic theory.

		discussed.		
Electrical circuits	5	Kirchoff's law regarding electric circuit is discussed. Then response of various circuits containing resistors, inductors and capacitors on application of alternating voltage is discussed.	Chalk and Talk	This particular topic finds application in electronics and instrumental science.
Network theorems	5	First basic ideas of current and voltage source are discussed. Then network theorems and their application in electric circuits are discussed.	Chalk and Talk	We come across various types of electric circuits in our electric and electronic applications where one can apply these theorems to analyse and simplify them.

Electricity and Magnetism (Practical)

Paper: PHS-A-CC-2-3-P Credits: 2

Topic	**No. of Classes required**	**Objective of the topic**	**Strategy of teaching implemented**	**Outcome**
To determine an unknown Low Resistance using Potentiometer	2	To get familiar with Potentiometer and use it to measure an unknown low resistance	Practical	To understand the basic principles of low resistance measurement
To determine an unknown Low Resistance using Carey Foster's Bridge	2	To get familiar with Carey-Forster's bridge and use it to measure an unknown low resistance	Practical	To understand the basic principles of low resistance measurement
To verify the Thevenin and Norton theorems	2	To verify network theorems experimentally	Practical	To experimentally verify Thevenin and Norton theorem
To verify the Superposition, and Maximum power transfer theorems	2	To verify these network theorems experimentally	Practical	To experimentally verify Superposition and Maximum power transfer theorem
To study response curve of a Series	2	To study response of a circuit containing resistor, inductor and capacitor under sinusoidal AC	Practical	To understand behavior of series LCR circuit under

LCR circuit and determine its (a)Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q,and (d) Band width		voltage		sinusoidal AC
To study the characteristics of a series RC Circuit	2	To study response of a circuit containing resistor and capacitor	Practical	To understand behavior of a series RC circuit
Determination of horizontal component of the earth's magnetic field	3	To get familiar with magnetometer and measure the horizontal component of Earth's magnetic field	Practical	To measure the horizontal component of earth's magnetic field experimentally

Semester - 2: Waves and Optics

Waves and Optics (Theory)

Credits: 4

Paper: PHS-A-CC-2-4-TH

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Oscillations	8	Studies various aspects of free vibration, damped and forced vibration starting from the defining equation of SHM.	Chalk and Talk	A very basic toy model with a huge field of application like Acoustics, Solid State Physics, Optics, Quantum Mech., Nuclear models and so on.
Superposition of Harmonic Oscillations	5	Interesting cases of motion comes up when two or more simple harmonic vibrations are applied simultaneously to a particle.	Chalk and Talk	Find application in acoustics, optics where this aspect leads to very interesting phenomena of sound and light waves.
Wave motion	10	Studies the differential eqn. and propagation of different kinds of	Chalk and Talk	Waves of different kinds appear in

		waves.		different places and their study is useful in Electromagnetism, Optics, Acoustics, Quantum Mech., etc.
Velocity of Waves	4	Role of the medium in propagation of longitudinal wave is discussed followed by Transverse vibration of stretched string.	Chalk and Talk	One gets the basic idea of sound wave propagation in different media which find application in acoustics, optics, and electromagnetic theory.
Superposition of Harmonic Waves	10	How superposition of two or more waves leads to very interesting wave phenomena is discussed.	Chalk and Talk	The underlying topic find application in acoustics, optics, electromagnetic theory, quantum mechanics, condensed matter physics and so on.
Wave optics	5	Derives the basic laws of Optics, starting from Huygen's wave theory.	Chalk and Talk	Demonstrates the strength of the wave theory of light. Forms the basis of the latter applications of Wave Optics.
Interference	8	Very interesting observed phenomenon employing light called interference is discussed based on wave nature of light.	Chalk and Talk	Demonstrates the wave nature of light.
Interferometers	8	Different optical set up employing interference phenomenon of light are demonstrated and their applications are discussed.	Chalk and Talk	Finds application in optics, modern physics etc.
Diffraction and Holography	3	Another very interesting phenomenon employing light called diffraction is discussed. Practical application employing wave phenomena of light example-holography is discussed.	Chalk and Talk	Finds application in medical science, advertising etc.

Waves and Optics (Practical)

PHS-A-CC-2-4-P

Credits: 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
To determine the frequency of an electric tuning fork by Melde's experiment and verify lambda^2-T law	2	To get familiar with electric tuning fork and experimentally find its frequency	Practical	By employing Melde's experiment one can determine frequency of an electric tuning fork
To determine refractive index of the Material of a prism using sodium source	2	To find the refractive index of the material of the prism	Practical	One learns to use spectrometer and use it to determine refractive index of the material of the prism
To determine the dispersive power and Cauchy constants of the material of a prism using mercury source	3	To determine coefficients of Cauchy dispersion formulae of the material of the prism	Practical	Using spectrometer one learns to find coefficients of Cauchy dispersion formulae of the material of the prism
To determine wavelength of sodium light using Fresnel Biprism.	3	To determine wavelength of any light source	Practical	Using Fresnel bi-prism one determines wavelength of an unknown light source
To determine wavelength of sodium light using Newton's Rings	2	To determine wavelength of any light source	Practical	Employing Newton's rings one can determine wavelength of an unknown light source
To determine the thickness of a thin paper by measuring the width of the interference fringes produced	2	To determine thickness of a thin paper by measuring fringe-width of interference fringes	Practical	By measuring fringe-width of interference fringes one can determine thickness of a thin paper

by a wedge-shaped Film				
Measurement of the spacing between the adjacent slits in a grating by measuring Sinθ vs λ graph of a certain order of grating spectra	3	To determine the spacing between the adjacent slits of a grating	Practical	By producing diffraction pattern one can determine the spacing between the adjacent slits of a grating

LEARNING MODULE FOR BSC GENERAL

SUBJECT- PHYSICS

Semester - 2: Electricity and Magnetism

Electricity and Magnetism (Theory)

Paper: PHS-G-CC-2-2-TH

Credits: 4

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Electrostatics	12	Basic idea of electrostatic field, potential of any charge distribution is discussed. Then various aspects of electrostatic field and potential are discussed followed by determination of electrostatic field and potential of few symmetric charge distributions. Idea of electric dipole is introduced followed by discussion of dielectric properties of matter.	Chalk and Talk	Discussed topics find application in condensed matter physics, nuclear physics, and modern physics and so on.
Magnetism	12	First the idea of magnetic force is introduced followed by the calculation of magnetic field of few steady current distributions. Then vector aspects of magnetic field induction are discussed followed by introduction of magnetic vector potential. Then the idea of magnetic dipole is introduced and then field and potential of magnetic dipole is calculated. Then magnetic properties of matter are discussed.	Chalk and Talk	Underlying ideas form the basic building blocks of classical and quantum field theory. These topics find application in condensed matter physics and material science.
Electromagnetic induction	4	Laws of electromagnetic induction are discussed. Then ideas of self and mutual induction are discussed. Then Maxwell's equations are discussed.	Chalk and Talk	The discussed ideas form the basic of electromagnetic theory.
Linear Network	6	First basic ideas of current and voltage source are discussed. Then network theorems and their application in electric circuits are discussed. Then various	Chalk and Talk	This particular topic finds application in elctronics and instrumental

		network theorems are discussed. Then response of various circuits containing resistors, inductors and capacitors on application of alternating voltage is discussed.		science.
Maxwell's Equations and Electromagnetic Wave Propagation	6	Maxwell's equations are discussed and then wave equation is derived from these equations. Propagation of EM wave in vacuum and dielectric medium is discussed.	Chalk and Talk	Forms the basis of classical and quantum field theory.

Electricity and Magnetism (Practical)

Paper: PHS-G-CC-2-2-P Credits: 2

Topic	**No. of Classes required**	**Objective of the topic**	**Strategy of teaching implemented**	**Outcome**
Determination of unknown resistance by Carey Foster method.	2	To get familiar with Carey-Forster's bridge and use it to measure an unknown low resistance	Practical	To understand the basic principles of low resistance measurement
Measurement of a current flowing through a register using potentiometer	2	To get familiar with Potentiometer and use it to measure an unknown low resistance	Practical	To understand the basic principles of low resistance measurement
Determination of the horizontal components of earth's magnetic field	3	To get familiar with magnetometer and measure the horizontal component of Earth's magnetic field	Practical	To measure the horizontal component of earth's magnetic field experimentally
Conversion of an ammeter to a voltmeter	2	To convert a given ammeter to a voltmeter of suitable range and calibrate the voltmeter so prepared	Practical	One can convert an ammeter to a voltmeter
Conversion of a voltmeter to an Ammeter	2	To convert a given voltmeter to an ammeter of suitable range and calibrate the ammeter so prepared	Practical	One can convert a voltmeter to an ammeter
Verification of Thevenin & Norton theorem and superposition theorem	2	To verify network theorems experimentally	Practical	To experimentally verify Thevenin and Norton theorem

বিষয় (CC3)	সাধারণ উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্ক্ষিত ফল
ধারণা এবং তত্ত্ব এবং বিস্তৃতি	শিখন এবং শিখনের বিভিন্ন তত্ত্বের সঙ্গে পরিচয় সৃষ্টির প্রক্রিয়া, সৃষ্টির প্রক্রিয়ার ক্রমবিকাশ	৫ ৩	আলোচনা পদ্ধতি আলোচনা পদ্ধতি শিক্ষক-শিক্ষার্থী আলোচনা	শিক্ষার্থীদের শিখন সম্পর্কে সুস্পষ্ট ধারণা হবে শিক্ষার্থীরা নিজেদের ভাবনাসৃষ্টির ক্রমবিকাশের প্রক্রিয়া বুঝতে পারবে। বিস্তৃতির তাৎপর্য গুরুত্ব উপলব্ধি
(CC4)				
র অর্থ র অর্থ র সঙ্গে শিক্ষার সম্পর্ক র ক্ষেত্রে দর্শনের ভূমিকা	দর্শনের অর্থ কার্যকারিতা এবং দর্শনের ভূমিকা শিক্ষার ধারণা দর্শনের সঙ্গে শিক্ষার সম্পর্ক শিক্ষাক্ষেত্রে দর্শনের ভূমিকা	৩ ২ ৩ ৩	আলোচনা পদ্ধতি আলোচনা ভাবনামূলক শিক্ষক-শিক্ষার্থী আলোচনা	শিক্ষার্থীদের মধ্যে দর্শনের ধারণা গড়ে উঠবে দর্শনের সঙ্গে শিক্ষার সম্পর্ক সম্বন্ধে সুস্পষ্ট ধারণা জীবনে দর্শনের মূল্য এবং তাৎপর্যপূর্ণতা

ষর স্বাক্ষর :

অধ্যক্ষা :

				Hhw B-aÈ¡fm¢i

¢n¢rL¡l p¡rl : AdÉr¡ :

Teacher's Name : Srumita Roychowdhury **Dept. of Education** **LEARNING MODULE** Sem.-II Education (Hons.)

Topic (CC3)	Objectives	Classes required	Strategy and Methodology	Outcome
Learning concept & theories	To introduce the learning and its various methods	7	Discussion interactive participatory	Students should be able to clear concept of learning and theories of learning
Memorization&forgetting	Process of memorization. Causes, Improving of memorization	3	Discussion interactive participatory	Explain what is meant by economy in memorising, Value of forgetting in our life
(CC4)				
Meaning of Philosophy	To understand the meaning, functions and important role of philosophy in our life.	3	Lecture discussion interactive participatory	Students should be able to clear concept of Philosophy and relation between Education & Philosophy and able to find out value of life, value of self.
Etymological meaning of Education	Concept of Education	2	Lecture discussion interactive participatory	
Relation between Philosophy and Education	To understand the relation between Philosophy and Education	3	Lecture discussion interactive participatory	

Importance of Philosophy in Education	Importance of Philosophy in Education	3	Lecture discussion interactive participatory	

Signature of the Teacher :

PRINCIPAL:

VIJAYGARH JYOTISH ROY COLLEGE

DEPARTMENT OF CHEMISTRY

LEARNING MODULE: CBCS SEMESTER III(HONS)

NAME OF FACULTY: DR SUMITA ROY

NAME OF TOPIC	NUMBER OF CLASSES REQUIRED	OBJECTIVE OF THE TOPIC	TEACHING METHODS FOLLOWED	OUTCOME
1) Aromatic Substitution **i) Electrophilic Aromatic Substitution** **ii) Nucleophilic Aromatic Substitution**	**1) 10 lectures**	1)i) With the help of Aromatic Substitutions, we will be able to outline the completed Electrophilic Aromatic Substitution reactions of the following types: Halogenation, Nitration, Sulfonation, Friedel Crafts Achylation and alkylation 1)ii) In a nucleophilic Aromatic Substitution Reaction, in which the ring acts as a nucleophile to a suitable electrophile, when Benzene participates in such substitution reactions, the product retains	1) i) First of all a clear lesson plan is made. ii) In lecture method, mainly chalk and talk method is followed. iii) After completion of each chapter, a group discussion is made amongst students. iv) To give a clear idea of the 3D structure of molecules, **BALL & STICK** model is used. v) To get more up to date knowledge on the subject, we access Google.	1) Electrophilic Aromatic Substitution Reaction, is one of the most important reactions in synthetic Organic Chemistry. Such reactions are used for the synthesis of important intermediates that can be used as precursors for the production of pharmaceutical, agrochemical and Industrial products.

NAME OF TOPIC	NUMBER OF CLASSES REQUIRED	OBJECTIVE OF TOPIC	TEACHING METHODS FOLLOWED	OUTCOME
		Its stability.		
2) Organometallics (Grignard Reagent)	**2) 5 lectures**	2)Organometallic Compounds are widely used both stoichiometrically in research and in industrial Chemical reactions as well as in the role of catalysts. To increase the rate of such reactions, where target molecules include polymers, pharmaceuticals and many other types of practical products.	2) Same as 1	2) Grignard Reagents are strong Bases that will react with acidic hydrogens and they are excellent nucleophiles. They are often used to form alchohols by reaction with aldehyde and ketones. First the Grignard forms the c-c bond, this creates an alkoxide. Various important medicines, such as Tamoxifen used for the treatment of breast cancer and cough-syrups use Grignard chemicals during their synthesis.
3)Exploitation Of Acidity Of α-Hydrogen Of Carbonyl: Formation of enols and enolates;	**3) 10 lectures**	3)Kinetic enolates are formed when a strong bulky base like LDA is used.The bulky base finds the	3) Same as 1	3)i) Condensation reactions – These reactions are involved in the production of may polymers, biosynthetic reactions form peptide bonds between aminoacids and are involved in fatty acid formation. Utilisation of aldol condensation in

NAME OF TOPIC	NUMBER OF CLASSES REQUIRED	OBJECTIVE OF TOPIC	TEACHING METHODS FOLLOWED	OUTCOME
		3) two ortho hydrogen atoms less sterically hindered and preferably removes it. Low temperatures are typically used to prevent equilibration to the more stable Thermodynamic enolates.		Biological and medicinal area has attracted considerable interest over the years as aldol reaction is one of the most fundamental tools for the construction of new c-c bonds.So in this review we provide a discussion of recent developments of aldol condensation in the area of bio-organic and medicinal chemistry.
4) Substitution at SP^2 carbon(C=O system) : mechanism (with evidence): $B_{AC}2$, $A_{AC}2$,$A_{AC}1$,$A_{AL}1$	**4) 5 Lectures**	4)Hydrolysis is an Organic Chemical reaction which involves the reaction of water and an ester, or it may use an acid or an alkali. There are three types of hydrolysis reaction: salt, acid and base reaction.	4) same as 1	4) The first commercial application was in the making of soap, a chemical digestion process called enzymatic hydrolysis can break the bonds holding the molecular building blocks within the food together eg.Proteins are broken down into their building block aminoacids.

Department: Microbiology

Name of faculty: Dr.GargiSahaKesh

Paper Taken	Description	Broad area	Mode of teaching	Outcome
UG Semester III: CC-7-P	1. Study of different types of DNA and RNA using micrographs and model / schematic representations 2. Study of semi-conservative replication of DNA through micrographs / schematic representations 3. Isolation of genomic DNA from *E. coli* 4. Estimation of salmon sperm / calf thymus DNA using colorimeter (diphenylamine reagent) or UV spectrophotometer (A260 measurement) 5. Estimation of RNA using colorimeter (orcinol reagent) or UV spectrophotometer (A260 measurement) 6. Resolution and visualization of DNA by Agarose Gel Electrophoresis. 7. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).	Molecular Biology Practical	Hands on and demonstration practical	1. Get idea about the structure of DNA and RNA. 2. Get idea about how semiconservative mode of replication takes place. 3. Hands on experience on genomic DNA isolation. 4. Hands on experience on different methods of DNA estimation. 5. Hands on experience on different methods of RNA estimation. 6. Hands on experience on DNA agarose gel electrophoresis 7. Detailed idea about proteins Polyacrylamide Gel Electrophoresis (SDS-PAGE).
UG Part III: Paper V A	Genetic exchange and recombination: Transformation, Conjugation, Hfr bacteria	Microbial Genetics	OHP, Chalk and talk	1. Detailed idea about Trnasformation, conjugation and

	and chromosome mapping, Transduction- generalised (P1) and specialized (lambda- phage). Homologous recombination (Holiday strauctur:Rec BCD system; gene conversion, site specific recombination (lambda), Transposable elements: Bacterial Transposons			transduction. 2. Knowledg e on homologous recombination, gene conversion, site specific recombination. 3. Detailed knowledge on transposons, specially bacterial transposons.
UG Part III:Paper VB	Isolation & purification of nucleic acids & protein, Finger printing, Southern blotting, Dot blotting, Northern blotting, Western blotting- techniques. Cloning vectors (pBR322, pUC 18, 19, YACs). Cloning, PCR techniques, Construction of DNA libraries (basic ideas and outlines of methods). Overexpression of recombinant proteins in bacteria: insulin, human growth hormone, FSH.	Industrial Microbiology & Recombinant DNA Technology	ICT, chalk and talk	1. Detailed knowledge on how to isolate nucleic acids and protein. 2. Idea on blotting techniques like dot blot, Southern etc. 3. Detailed knowledge on vectors, cloning techniques. 4. Theoretica l knowledge on DNA library construction 5. Detailed knowledge on overexpression of recombinant proteins like FSH etc.
UG Part III:Paper VIII	Isolation of plasmid DNA, Restriction digestion of DNA, Transformation of bacteria, Conjugation, Blood grouping, Immunoelectrophoresis, ODD, SRID	Recombinant DNA Technology and Immunology Practical	Hands on practical	Hands on experience on plasmid DNA isolation, restriction digestion, transformation, conjugation, blood grouping, immunoelectroph oresis, ODD and SRID.

PG Semester I: C 14	General laboratory practices and handling of instruments; training on centrifugation, microscopy and spectroscopy.	Biophysical Methods & Instrumentation Practical	Hands on and demonstration practical	1. Detailed knowledge of general laboratory practices and instrument handling. 2. Hands on training on centrifugation, microscopy and spectroscopy.

Department of Physiology

Learning Module for Semester 1(CC1/GE1)

Vijaygarh Jyotish Ray College

Unit	Topic	Learning outcome	Teaching Strategy	Name of Teacher
CC1/GE1 Theory	**1. Cellular Basis of Physiology** Structure and functions of plasma membrane, nucleus and different cell organelles – Endoplasmic reticulum, Golgi bodies,Mitochondria, Lysosome and Peroxisome.	The human body is composed of billions of cells, each with a distinct function. Despite this diversity in structure and functions, all cells share some common elements both structurally and functionally. This chapter focuses on those common important features/organelles of a living eukaryotic cell and their respective functions. Students will able to understand the structures of each cell organelle and explain their functions inside a cell and its overall functionality in respect to whole body system.	Lecture, board work, e-learning instant enquiry, discussion of problems and class notes.	SM
	2. Biophysical Principles, Enzymes and Chemistry of Bio-molecules Physiological importance of the following physical processes: Diffusion , Osmosis and Surface tension. pH and Buffers – Significance in human body and maintenance of pH in the blood. Colloids - Classification and physiological importance. Enzymes: Classification, factors affecting enzyme action. Concept of coenzymes and isozymes. Carbohydrates : Definition and classification. *Monosaccharides* – Classification, structure, physiological importance. *Disaccharides* Maltose, Lactose and Sucrose: Structure, occurrence and physiological importance. *Polysaccharides* Starch, Glycogen, Dextrin, Cellulose. Lipids : Definition and classification. Fatty acids Classification. — Definition and importance of, Saponification number and, Iodine number.. Phospholipids, Cholesterol & its ester -- physiological importance. Amino acids, Peptides and Proteins: Classification and	The aim of biophysics and biochemistry is to explain, at molecular level, of all the physical and chemical processes associated with living cells. To achieve this goal, this chapter focuses on the mechanisms involved in many biophysical processes, some most important bio-molecules, their structures and functions in living cells. After completion of this chapter students will be able to- 1. Interpret and understand simple physical processes like diffusion and osmosis and also complex processes like ultrafiltration and pH balance and their importance in a living cell. 2. Understand some fascinating features like colloids and enzymes. 3. Gain knowledge about most important chemicals- carbohydrates, proteins and fats. They will be able to understand their structural and functional relationship, classify them based on many features and bond formation at molecular level and most importantly their physiological importance in a living cell. 4. Understand structure and functions of DNA and RNA and differentiate between them.	Lecture, board work, e-learning instant enquiry, discussion of problems and class notes..	SM

	structure. Structure of peptide bonds. Nucleic acids:Structure of DNA and RNA.			
	3. **Digestion & Metabolism** Structure in relation to functions of alimentary canal and digestive glands. Composition, functions and regulation of secretion of digestive juices including bile. Digestion and absorption of carbohydrate, protein and lipid. Movements of the stomach and small intestine. Glycolysis, TCA cycle, Importance of Glycogenesis, Glycogenolysis and. Gluconeogenesis. Beta oxidation of saturated fatty acid. Importance of Ketone bodies. Deamination & Transamination. Formation of urea .	The word "living" for a living cell is determined by its ability for energy metabolism and ionic potential across plasma membrane, both of which is absolutely dependant on digestion and metabolism of nutrients. That's why one of the major systems in human body is the digestive system which involves many organs and enzymes. Food inside digestive tract is broken down by enzymes and absorbed into blood and reaches all the cells in the body and later produces energy (ATP) by cellular metabolism. Students will be able to understand and interpret all these procedures and also: 1. Understand the structures and functions of the digestive organs and their specific functions related to different types of foods. 2. will be able to know the functions and classify different digestive enzymes 3. will be able to differentiate between extra- and intra-cellular enzymes 4. gather knowledge about most important process involved in energy production 5. Understand energy metabolism.	Lecture, board work, e-learning instant enquiry, discussion of problems and class notes.	SM
CC1/GE1 Practical	1. Examination and staining of fresh tissues : Squamous, Ciliated and Columnar Epithelium by Methylene Blue stain Qualitative tests for identification of : Glucose, Fructose, Lactose, Sucrose, Starch, Dextrin, Lactic acid, Hydrochloric acid , Albumin, Acetone, Glycerol and bile salt.	Practical and Demonstration classes provide a careerist approach for the students. i) Students will be able to identify and distinguish between different epithelial cells in normal human body. ii) They will be able to identify some known and unknown bio-molecules which are most important in a living cell. iii) they will be able to measure percentage and total quantity of some specific bio-molecules by titration method.	Lecture, demonstration and practice.	SM

SOMA MAJUMDER
HOD
Department of Physiology

Department of Physiology

Learning Module for Semester 3(CC3/GE3)

Vijaygarh Jyotish Ray College

Unit	Topic	Learning outcome	Teaching Strategy	Name of Teacher
CC3/GE3 Theory	**Nerve-muscle Physiology** Structure of neurons. Origin and propagation of nerve impulse. Velocity of impulse in different types of nerve fiber. Properties of nerve fibers: all or none law, rheobase and chronaxie, refractory period. indefatiguability. Synapses: structure, mechanism of synaptic transmission. Motor unit. Myoneural junction: structure, mechanism of impulse transmission. Degeneration and regeneration in nerve fibers. Different types of muscle and their structure. Red and white muscle. Muscular contraction: structural, mechanical and chemical changes in skeletal muscle during contraction and relaxation. Isotonic and isometric contractions. Properties of muscle: all or none law, beneficial effect, summation, refractory period, tetanus, fatigue.	Neurones are the most fascinating and most important tissues in human body. Another important and equally functioning system is the muscle system. Both neurones and muscles together form the neuro-muscular system in humans. Both these systems work as one of the major connecting tissue system. Neurones help to connect the body with both outside and inside environment. As well as muscles help us to move and do every other work. From this chapter students will be able to: 1. Understand the extraordinary structure and functions of the neuro-muscular syatem. 2. Distinguish between different types of neurones and muscles and how these different features are important for their respective functions. 3. coordination between functions of the neurone and muscle. 4. role of different cataions and anaions in generation of nerve impulse and its conduction throughout body. 5. Understand the generation of electrical, chemical and mechanical impulse and how these are most important for a living system.	Lecture, board work, e-learning instant enquiry, discussion of problems and class notes.	SM
	Nervous System: A brief outline of organization and basic functions (sensory, motor and association) of the nervous system, central and peripheral nervous system. Ascending tracts carrying touch, kinaesthetic,temperature and pain sensations. Descending tracts: pyramidal tract and brief outline of the extra-pyramidal tracts. Reflex action - definition, reflex arc, classification, properties. Functions of the spinal cord. Outline of functions of brain stem. A brief idea of the structure, connections and functions of cerebellum. Different nuclei and functions of thalamus and hypothalamus. Cerebral cortex: histological structure and localization of functions.	Nervous system is the most important organization which controls and integrates the different bodily functions and also maintains stability and homeostasis in the internal environment despite extreme changes in the external or internal environment. This system is extremely necessary for reception, storage and release of different sensory and motor functions and information. It is a very complex system and its structures and organs are highly specialized for different specific functions. After completion of teaching-learning session on this chapter students will: 1. Understand the complicated structure of the nervous system, its organizations and functions 2. Be able to distinguish between sensory and motor signals, their coordination through rflex actions and also learn about the neuronal pathways/tracts carrying these signals throughout our body.	Lecture, board work, e-learning instant enquiry, discussion of problems and class notes.	SM

	CSF : composition, formation, circulation and functions. A brief description of the organization of the autonomic (sympathetic and parasympathetic) nervous system. Functions of sympathetic and parasympathetic nervous system. A brief idea of speech, aphasia, conditioning, learning and memory.	3. The structure and functions of the brain and spinal cord. And their functions regarding conditioned and unconditioned reflrex. 4. Understand the functions of different brain areas regarding Learning, Memory, Emotions, Intellegence, Motor control, Thinking, Sleep, Body temperature maintenance, Body balance and Kinaesthetic coordination and many more.		
	Special Senses *Olfaction and Gustation:* Structure of sensory organ, neural pathway of olfactory and gustatory sensation. Mechanism of olfactory and gustatory sensation. Olfactory and gustatory adaptation. After-taste. *Audition:* Structure of ear, auditory pathway, mechanism of hearing. *Vision:* Structure of the eye. Histology of retina. Visual pathway. Light reflex. Chemical changes in retina on exposure to light. Accommodation - mechanism. Errors of refraction.. Light and dark adaptation. Elementary idea of colour vision and colour blindness.	To cope up with external environmental changes, the nervous system is necessary but not enough, because, until unless the stimulants physically stimulate, general sensations will not be able to inform the central nervous system. For this purpose, a special information system exists to recognize external stimulants from a distance, which are known as Special Senses. They include eye, ear, skin, tongue and nose. After completion of this chapter students will: 1. Understand structure and specific functions of these special organs. 2. Be able to distinguish between different neuronal organizations involved in different special sensory mechanism. 3. Understand mechanism of special sensory adaptations. 4. Have elementary idea about vision, light and darkness and mechanism of image formation through eye. 5. Learn about some common visual errors.	Lecture, board work, e-learning instant enquiry, discussion of problems and class notes.	SM
CC3/GE3 Practical	Silver Nitrate preparation of nodes of Ranvier. Silver nitrate preparation of corneal cell space. Examination and staining of skeletal and cardiac muscles by Methylene Blue stain.	Practical and Demonstration classes provide a careerist approach for the students. i) Students will be able to the Nodes of Ranvier located in myelinated neuones. ii) They will be able to identify cell spaces in cornea in eye. iii) They will be able to distinguish different features between cardiac and skeletal muscles when examined under microscope.	Lecture, demonstration and practice.	SM

S.Majumder

SOMA MAJUMDER
HOD
Department of Physiology

Name of the Teacher : Bishnupriya Bhattacharya **Dept. of History** **LEARNING MODULE** CC-1 **Sem.-I** History (Hons.)

Objectives	Topic	Classes required	Strategy and Methodology	Outcome
In today's Technological World Every one of Us Tend to forget Our Past, our tradition, our roots, our history. But history actually shapes us, what we are today is actually what we were yesterday. Thus, as a teacher of history, my aim is to refresh the knowledge so that our students can learn new things that they have already learnt. My aim would be thus from transforming their knowledge from oblivion to reality. The iron age was a period in human history the bronze and stone ages. During the iron age, people across much of Europe began making tools and weapons. The iron age started between 1200BC and 600 BC depending on the region.	**Paper – I** History Of India From The Earliest Times to 300BCE **Section- III** The harappan civilisation origins, settlement patterns and town planning, agrarian base, craft productions and trade, social and political organisation, religious beliefs and practices, art, the problem of urban decline and the late / post – Harappan traditions.	3 2 2 2 2 2 2 2 2 4	1) Traditional Way of Teaching. 2) Interactive Classes. 3) Discussion Of Topics 4) Power–Point Presentation 5) Tutorials.	The history of Indus valley civilisation, one of the earliest civilisations of the world teaches us the height of modernity Harappan civilisation forms an important landmark in the pre history of the Indian subcontinent. The civilisation offers an excellent example to the modern world in various ways. Their expertise in town planning, water management and harvesting systems as well as drainage mechanism us unparalleled. My students get well aware of the topic and aspires to do research work in the future examinations are also conducted on the topic to assess their progress.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher : Bishnupriya Bhattacharya **Dept. of History** **LEARNING MODULE** CC-2 **Sem.-I** History (Hons.)

Objectives	Topic	Classes required	Strategy and Methodology	Outcome
The iron age was a period in human history the bronze and stone ages. During the iron age, people across much of Europe began making tools and weapons. The iron age started between 1200BC and 600 BC depending on the region.	**Paper – II** Social formations and cultural pattern of the ancient world other than India. **Section- IV** Nomadic groups in Central Asia; Debate on the advent of iron and its implications.	10	1) Traditional Way of Teaching. 2) Interactive Classes. 3) Discussion Of Topics 4) Power-Point Presentation 5) Tutorials.	One of the most important stimuli for the military revolution was the discover and use of iron. Iron was first employed as a technology of war about 1300 BC. by the Hittites. Iron weapons were heated and hammered into shape rather than cast, making them stronger, less brittle and more reliable than bronze weapons. Iron age had a deep impact on the society and economy. Examinations are also conducted on the topic to assess the progress of the students.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher: Bishnupriya Bhattacharya **Dept. of History** **LEARNING MODULE** CC-5 **Sem.-3** History (Hons.)

Objectives	Topic	Classes required	Strategy and Methodology	Outcome
Objective of learning religious and cultural developments of ancient and medieval India is to connect the modern day life to past events and logically find its authenticity. Age after age, empire after empire, society religion had been the inspiring force and had shaped the basic constitution and its nature. In my class, I will try to take a close look at these subtle junctures and analyse them, understand its relevance and context and its direct relation with contemporary art and culture.	**Paper – V** History Of India III (CE 750 -1206) **Section-V** A. Bhakti, Tantrian, Puranic tradition, Buddhism and Jainism, Popular religious cults. B. Islamic Intellectual Traditions: Al–Biruni Al - Hujwiri C. Regional language and literature. D. Art and architecture: Evolution of regional styles.	5 4 3 3	1) Traditional Way of Teaching. 2) Interactive Classes. 3) Discussion Of Topics 4) Power–Point Presentation 5) Tutorials.	Students gain familiarity with a wide range of religious and cultural subject that span distinct area and religion and recognise distinct Socio- religious organisation and compare them with the present day situation. Religion occupies an important place in human society. It is believed by various thinkers that religion, art and culture are instinctive in man. It formulates human conduct, behaviour, social sense, morality etc. The purpose of this paper is to highlight the meaning, origin, different aspect s and role of religion in society. Side by side efforts will be given to delineate the dark aspects of it and justify the necessity of religion in society. Examination are also conducted the progress of the students outcomes.

Signature of the Teacher :

PRINCIPAL

Objectives	Topic	Classes required	Strategy and Methodology	Outcome
Rather Than The Period With Definitive Beginnings And Endings And Consistent Content In Between, The Renaissance Can Be Seen As A Movement Of Practices And Ideas To Which Specific Groups And Identifiable Persons Variously Responds Indifferent Times And Places. It Would Be In This Sense A Network Of Diverse, Sometimes Conflicting Cultures, Not A Single, Time Bound Culture.	**Paper – VI** Rise of the Modern West -I **Module- III** 3.1. Renaissance : Its Social Roots. 3.2. Renaissance Humanism. 3.3. Rediscovery of Classics 3.4. Italian Renaissance And Its Impact On Art, Culture, Education And Political Thought. 3.5. Its Spread In Europe.	4 3 3 6 4	1) Traditional Way of Teaching. 2) Interactive Classes. 3) Discussion Of Topics 4) Power–Point Presentation 5) Tutorials.	The Renaissance Was A Cultural Movement That Profoundly Effected European intellectual life in the early modern period. Beginning in Italy and spreading to the rest of Europe by the 16th century. Its influence was felt in literature, philosophy, art, music, politics, science, Religion and other aspects of intellectual enquiry. Renaissance scholars employed the humanist method in study and searched for realism and human emotion in art. The renaissance could be viewed as an attempt by intellectuals to study and improve the secular and worldly, both through the revival of ideas from antiquity, and through novel approaches to thought. However, it is important to recognise the countess modern institution that came up with renaissance, often considered as the modern epoch. Examinations are often conducted on this to assess their overall development.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher: Bishnupriya Bhattacharya **Dept. of History** **LEARNING MODULE** CC-7 **Sem.-3** History (Hons.)

Objectives	Topic	Classes required	Strategy and Methodology	Outcome
The Bhakti movement had its origin in the 6th century CE when the Alvars (Vaishnavites) and the Nayanars (Shivites) had emerges in south India. The Bhakti movement emerged in Northern and Eastern India much later. Further, here it manifested in different forms, such as Dvaitism (dualism) or Advaitism (monism), Saguna and Nirguna schools, and different sects which were based on worship of different deities (Such as Vaishnavism, Shaivism, Shaktism, Smarlism, etc.) my motto in class is to make the students aware of all these.	**Paper – VII** History of India (C. 1206 -1526) { Since Delhi Sultanate came to an in 1526 with the first battle of Panipath} **IV Religion & Culture** a) Sufi Silsilas: Chistis and Suhrawardis; doctrines and practices, social roles. b) Bhakti Movements and monotheistic traditions in South and North India; Women Bhaktas.	6 6	1) Traditional Way of Teaching. 2) Interactive Classes. 3) Discussion Of Topics 4) Power-Point Presentation 5) Tutorials.	In The Latter Half Of The First Millennium, Emerged A New Devotional Trend in the Hindu society which aimed to purge the religion of its Brahmanical orthodoxy, evils like untouchability, and loosen the grip of the cast system. Its tents were based on devotion of mankind. The movements reached its zenith in the 15th C & 16th C. And it's referred to as Bhakti Movement. Sufism contributes in reducing religious hatred, fanaticism and fundamentalism of any kind in the society of Bengal. It has social and economic impacts as well on the people. Students studied the amalgamation of these two movements and enlightened themselves. Examinations are also conducted on the topic to assess the progress of the students.

Signature of the Teacher :

PRINCIPAL

শিক্ষিকার নাম : বিষ্ণুপ্রিয়া ভট্টাচার্য্য **(LEARNING MODULE)** লার্নিং মডিউল **ইতিহাস বিভাগ** সেমিষ্টার - ১ ইতিহাস (সাম্মানিক)

বিষয় (CC-1)	প্রয়োজনীয় ক্লাস সংখ্যা	বিষয় (CC-2)	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
পেপার : ১		**পেপার : ২**		আজকের তথ্যপ্রযুক্তির যুগে ভারতের তথা বিশ্বের প্রাচীন ও মধ্যযুগীয় ইতিহাস চর্চা করা, তাদের সচেতন করা এবং ছাত্র-ছাত্রীদের বোঝানো যে ইতিহাসের মধ্যেই লুকিয়ে আছে আমাদের শিকড় আমাদের ভিত । ইতিহাস আমাদের যে বর্তমানে আমরা তা প্রয়োগ করি, ভুল শুধরাই ।ইতিহাস অনাদি, ইতিহাস সত্য, ইতিহাস চিরন্তন ।	১। বর্ণনামূলক পদ্ধতি ২। গতানুগতিক পদ্ধতি ৩। প্রশ্নোত্তর পদ্ধতি ৪। আলোচনামূলক পদ্ধতি ৫। পাওয়ার পয়েন্ট উপস্থাপনা ৬। টিউটোরিয়াল	ছাত্র-ছাত্রীরা ভারতের তথা বিশ্বের প্রাচীন ও মধ্যযুগীয় ইতিহাস সম্পর্কে অবগত হবে ও সচেতন হবে । ভবিষ্যতে এটি নিয়ে গবেষণার কাজে আগ্রহী হবে । জানা থেকে অজানা তথ্য আবিষ্কারের অনুপ্রেরণা পাবে । তাদের সে কাজে উৎসাহিত করা ও সবসময় পরীক্ষা নিয়ে তাদের ক্রমবর্ধমান উন্নতির উপর লক্ষ্য রাখা হয় ।
ভারতের প্রথম ইতিহাস থেকে ৩০০ বর্ষের ইতিহাস	৩	**ভারত ছাড়া অন্য প্রাচীন বিশ্বের সামাজিক গঠন ও সাংস্কৃতিক প্যাটার্ন**				
	২		৫			
সিন্ধু সভ্যতা, উৎপত্তি,	২	কেন্দ্রীয় ও পশ্চিম এশিয়ার				
শহরে পরিকল্পনা, কৃষি,	২	যাযাবর শ্রেণী, ক্লেহ'র				
নেপুন্যকলা, বাণিজ্য,	২	আবির্ভাব এবং তার প্রভাব ।				
সামাজিক ও রাজনৈতিক	২		৫			
সংগঠন, ধর্মীয় বিশ্বাস এবং	২					
অনুশীলন, কলা, সিন্ধু	২					
সভ্যতার বিবর্তন ও তার	৪					
পতনের কারণ ।						

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

বিষয় (CC-5)	প্রয়োজনীয় ক্লাস সংখ্যা	বিষয় (CC-6)	প্রয়োজনীয় ক্লাস সংখ্যা	বিষয় (CC-7)	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
ধর্মীয় ও সাংস্কৃতিক উন্নয়ন ।		**আধুনিক পশ্চিমের উত্থান**		**ভারতের ইতিহাস (১২০৬ - ১৫২৬)**		ইতিহাস আমাদের শুধু শেখায় বা শুধরায় না, ইতিহাস আমাদের চিন্তাশীল করে ইতিহাস আমাদের নতুন কিছু আবিস্কারের অনুপ্রেরণা জোগায় । ইতিহাস তাই পুরানো ও নতুনের মেলবন্ধন, সে ভারতের ইতিহাস হোক কিংবা বিশ্বের । এবার সিলেবাসে অনেক বিষয় রয়েছে যা ছাত্র-ছাত্রীদের পরবর্তী জীবনে উচ্চশিক্ষার ক্ষেত্রে উপকার আসবে ।	১। বর্ণনামূলক পদ্ধতি ২। গতানুগতিক পদ্ধতি ৩। প্রশ্নোত্তর পদ্ধতি ৪। আলোচনামূলক পদ্ধতি ৫। পাওয়ার পয়েন্ট উপস্থাপনা ৬। টিউটোরিয়াল	ছাত্র-ছাত্রীরা ভারতের তথা বিশ্বের মধ্য ও আধুনিক যুগের ইতিহাস সম্পর্কে অবগত হবে । ভবিষ্যতে এটি নিয়ে গবেষণার কাজে আগ্রহী হবে । তাদের সে কাজে উৎসাহিত করা ও সবসময় পরীক্ষা নিয়ে তাদের ক্রমবর্ধমান উন্নতির উপর লক্ষ্য রাখা হয় ।
১। ভক্তি	৩	১। নবজাগরণ ও তার সামাজিক শিকড়	২	**ধর্ম ও সংস্কৃতি**				
২। তান্ত্রিক তন্ত্র	২	২। নবজাগরণ ও মানব ধর্ম	২	১। সুকী সিলসিনা	৫			
৩। পুরাণ	২	৩। ক্লাসিক সাহিত্যের পুনরায় আবিষ্কার	৪	২। ভক্তি আন্দোলন	৫			
৪। বৌদ্ধধর্ম	৩	৪। ইতালিয় নবজাগরণ	৪					
৫। জনপ্রিয় ধর্মীয় কাল্ট	২	৫। নবজাগরণের ইউরোপ বিস্তার	৩					
৬। ইসলামিক বুদ্ধিজীবী ঐতিহ্য	৩		২					
৭। আঞ্চলিক ভাষা ও সাহিত্য	৩							
৮। শিল্প ও স্থাপত্য: আঞ্চলিক শৈলী বিবর্তন	৪							

শিক্ষিকার স্বাক্ষর :

অধ্যক্ষা :

Name of the Teacher : Angira Sen **Dept. of History** **LEARNING MODULE** **Sem.-I** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
(CC-1)				
1. Early Indian notions of History	The students must be aware of the interpretation of History.	2	Traditional Method	Students were keen on knowing about the interpretation.
2. Sources of History	Students must know about the various sources of History.	5	Interaction Method	Students were interested in knowing about the various sources of History.
(CC –II)				
1) Palaeolithic & Mesolithic cultures of the ancient world.	The students must be aware of Palaeolithic & Mesolithic culture.	5	Traditional Method	Students were keen on knowing about the Palaeolithic & Mesolithic culture
2) Role of Kinship.	The students must come to know about the term Kinship.	5	Interaction Method	Students were keen on knowing about the role of Kinship.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher : Angira Sen **Dept. of History** **LEARNING MODULE** **Sem.-III** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
(CC-V) 1. Political achievements of Rastrakutas, Palas, Pratiharas, Rajputs & Cholas.	The students must be aware of the different political achievements of the rulers of these dynasties.	10	Traditional Method	The students were interested in knowing the political as well as administrative achievements of the different rulers.
2. Arab Conquest of Sindh.	Students must know about the nature & impact of the Arabs.	5	Interactive Method	The students were very keen to about the history of the Muslim invaders & its impact on India.
3. Causes & consequences of early Turkish invasions.	Students must know about the Turkish invaders and their achievements.	5	Traditional Method	The students came to know about the history of Turkish rulers & their achievements.
(CC –VI) 1) Commercial Revolution	The students must be aware of the commercial revolution of Europe.	2	Traditional Method	The students were interested in knowing the revolution that took place in the Commercial world.
2) Price Revolution	The students must know about the Price Revolution of Europe.	5	Interactive Method	The Students are keen to know about the hike of prices in Europe.
3) Enclosure Movement	The students must be aware of the Enclosure movement that took place in Europe	5	Interaction Method	The students came to know about the word Enclosure, its importance in Europe & the related movements concerning Enclosure.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher :AngiraSen **Dept. of History** **LEARNING** **MODULE** **Sem.-III** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
(CC – VII) 1. Sufi Literature.	The students must be aware of the books written by the Sufi saints.	4	Traditional Method	Students were keen to know about the literary works of the Sufis.
2. Architecture of the Delhi Sultanate	The students must be come to know about the Architecture built by the Delhi Sultans.	10	Interactive Method	The students were interested in knowing the cultural achievements of the Delhi Sultans.

Signature of the Teacher :

PRINCIPAL

ACADEMIC PLAN AND LEARNING MODULE

Department of Microbiology

Dr.Saswati Gayen

Class	Topic	Sub- Topic	Outcome of Teaching	Method of Teaching	Reference Books	Time for completion
B.Sc 1st Semester (CC1)	Diversity of Microbial World	Systems of classification	Starting with the concept of evolution of microorganisms on earth then moving on to the Binomial Nomenclature of bacteria and the rules regarding framing the names of bacteria. Starting from two kingdom classification upto Whikkaker's five kingdom classification including its drawbacks and finally Carl Woese's three kingdom classification	Powerpoint presentation, chalk and talk as well as google classroom	Prescott, R.P.Singh, Atlas	July-August
		General characteristics of cellular and acellular microorganisms	Detailed knowledge about the different kinds of microorganisms both prokaryotic and eukaryotic including viruses, viroids and prions.			
		Algae	General characteristics of algae, vegetative as well as reproductive structures, different types of life cycle with suitable examples and application of algae in various fields	Overhead projector, chalk and talk and google classroom	Vashista, H.C. Dubey	August-September
		Fungi	General characteristics of fungi, vegetative as well as reproductive structures, heterokaryosis, heterothallism, parasexual mechanism and economic importance of fungi.	Powerpoint presentation, overhead projector, chalk and talk, google	Pelczar, Alexopolus	September-October

				classroom		
		Protozoa	General characteristics including vegetative structure and reproduction. Special reference to *Amoeba, Paramecium, Plasmodium, Leishmania and Giardia.*	Powerpoint presentation, overhead projector, chalk and talk, google classroom	Pelczar	October-November
B.Sc 1st Semester (CC!) Practical	Introduction to microbiology and microbial diversity	----------	Concept about good laboratory practices, working principle of different instruments used in microbiological laboratory with special focus on different types of sterilization process and assessment for sterility. Preparation of bacteriological medias. Microscopic study of vegetative and reproductive structures of some algae, fungi and protozoa using permanent as well as temporary mount. Detection of the presence of microorganisms in air.	Hands on experience and demonstration.		July-November
B.Sc 1st Semester (CC2) Practical	Bacteriology	----------	Knowledge about different types of bacteriological medias including their composition and preparation technique, subculturing method as well as preservation technique. Microscopic observation of different morphological and structural features of bacteria by various staining procedures and also motility detection. Idea about isolation of pure culture of microorganisms by serial dilution and	Hands on experience and demonstration		July-November

			various plating techniques.			
B.Sc 3rd Semester (DSE)	Microbial quality control in food and Pharmaceutical Industries	Microbiological laboratory and safe practices	Knowledge about working in microbiological laboratory, safety measures, biological safety level, biosafety cabinets, discarding biohazardous waste	Powerpoint presentation and google classroom	Aneja	July
		Determining microbes in food	Different techniques used to determine the presence or absence of specific microbes in food through standard culture, microscopic, biochemical, immunological and molecular methods	Powerpoint presentation and google classroom	Salle, Aneja	August
		Pathogenic microorganism of importance in food and water	Use of different types of media to isolate various groups of microorganisms from food samples, ascertaining microbial quality of milk	Powerpoint presentation and google classroom	Salle, Aneja	September
		HACCP	Principles, flow diagrams, limitations of HACCP and BIS standards for common foods and drinking water	Powerpoint presentation and google classroom	Salle, Aneja	September
B.Sc 3rdYr	Medical Microbiology	Normal microbial flora and pathogenesis	Knowledge about the normal microbial flora present in various parts of the human body and their beneficial effects. Virulence determinants of various microorganisms and their role in causing different types of infection.	Chalk and talk	Pelczar, Greenwood	July-August
		Some bacteria, viral, fungal and protozoan diseases	Knowledge about the causative organisms, virulence determinants, pathogenesis, types of infection, symptoms , prevention and control	Overhead projector, chalk and talk	P. Chakraborty	September-December
		Structural variation in bacteria	Knowledge about the unique structural features of budding bacteria,	Overhead projecto	Stanier, review articles	August, Septe

M.Sc 1st Semester	Cell biology		Rickettsia, Chlamydia, Myxobacteria and Sheathed bacteria- their morphology, mode of nutrition, life cycle and diseases caused by them	r, powerpoint presentation, chalk and talk, google classroom		mber, October
		Bacterial cell wall and endospore	Structure and synthesis of cell wall, wall disrupting compounds, bacterial endospore structures, chemical composition, genes controlling the endospore formation and germination process.	Overhead projector, chalk and talk, google classroom	Review articles	November

LEARNING MODULE FOR B.Sc. HONS

SUBJECT- PHYSICS

Semester – 3 : Mathematical Physics – II

Mathematical Physics – II (Theory)

Paper : PHS-A-CC-3-5-TH

Credits : 4

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Fourier Series	10	A periodic function can be expanded in terms of sinusoidal functions under certain conditions. Techniques and properties of such expansion is studied. The techniques can even be extended to a-periodic functions using certain tricks.	Chalk and Talk Smart Class Google Classroom	A very important mathematical tool, which finds application in acoustics, heat, electricity-magnetism, electronics and many other branches.
Frobeneus Method and Special Functions	16	A general technique for solving ordinary differential equations. The solution appears in the form of a series which is often a well-known function, e.g., the Legendre polynomial or the Bessel function. The properties of such functions are studied.	Chalk and Talk Smart Class Google Classroom	Not all the differential equations appearing in Physics can be directly solved using simple techniques. A general way of tackling such problems is studied. Application is found in Electrostatics, Magnetostatics Quantum Mechanics, and so on.
Some Special Integrals	4	Methods of evaluating some frequently appearing integrals (e.g., beta, gamma and error function) are learned.	Chalk and Talk Smart Class Google Classroom	Methods of evaluating some important integrals and their inter-relation are discussed. Such integrals appear in many areas like Statistics, Kinetic theory of gases, Quantum Mechanics, etc.
Variational Calculus in Physics	15	Method of extremizing a functional (integral) by choosing a function – is learned. A formulation of Classical Mechanics is developed on the basis of this technique.	Chalk and Talk Smart Class Google Classroom	The condition of extremization of a functional is found. The Lagrangian and the Hamiltonian formulation of Mechanics is developed as an example of this technique. Example can also be found in other areas, e.g., Optics.

Partial Differential Equations	5	Partial differential equations are differential equations involving more than one independent variables. Among different methods for solving them, the 'separation of variable' technique is discussed.	Chalk and Talk Smart Class Google Classroom	Solving partial differential equations become essential in many branches of Physics, e.g., Acoustics, Heat, Electromagnetism, Quantum Mechanics, etc.

Mathematical Physics – II (Practical)

Paper : PHS-A-CC-3-5-P

Credits : 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Intro. To Numerical Computation using numpy and scipy	6	Learning the use of different modules like numpy, linalg, matplotlib and scipy	Practical	Learning tools for handling arrays, operations of linear algebra, plotting graphs, optimization and solving differential equations.
Soln. of linear system of eqns.by Gauss elimination method and Gauss - Seidel method	2	To develop python Programs based on Gauss elimination and Gauss - Seidel technique	Practical	Learning methods of solving linear simultaneous equations.
Diagonalization of matrices, Inverse of a matrix, Eigen vectors and eigen values problems	2	To learn different matrix operations	Practical	Matrix operations like inverting and diagonalization become necessary in many branches of Physics. Here we learn some numerical methods to achieve such goals.
Generations of special functions using user defined functions	2	Generating and plotting Legendre and Bessel functions	Practical	Special functions like Legendre or Bessel functions find application in many branches of Physics. The aim here is to generate them numerically, using their generating functions and the recursion relations.
Root finding : Bisection and Newton - Raphson method	2	To develop python Programs based on Bi-section and Newton – Raphson method.	Practical	Learning numerical method for finding the roots of a general equation.

Interpolation by Lagrange's method	2	To develop a python Program based on Lagrange's interpolation technique.	Practical	To fit an n-th degree polynomial, when (n + 1) number of data points are available.
Numerical differentiation – forward and backward difference formulae	2	To develop an approximate method to find the derivative of a function.	Practical	To differentiate a function analytically may be complicated and sometimes it may be necessary to find he derivative within a program. The purpose therefore, is to develop a numerical method for differentiation.
Numerical integration – trapezoidal and Simpson's rule	2	To learn Trapezoidal and Simpson's rule for evaluating a definite integral.	Practical	Often, we encounter integrals, which are difficult or impossible to evaluate analytically. Here, the approximate methods of evaluating such integrals are discussed and compared.
Soln. of ODE : 1st order differential eqn, – Euler's method	2	A simple numerical method of solving 1st order, ordinary diff. eqn. is developed.	Practical	Differential equations are faced in almost all branches of Physics. Here a simple method (viz. that of Euler), to find an approximate solution is discussed.
Basic 3D graph plotting – plotting functions and data files, parametric plots, surface and contour plots	4	To generate a three - dimensional graph using python programming	Practical	Often, more than two variables are found related and we wish to visualize their inter-dependence in a 3D graph. Here we learn plotting such 3D graphs using python Language.

Semester – 3 : Thermal Physics

Thermal Physics (Theory)

Paper : PHS-A-CC-3-6-TH

Credits: 4

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Introduction to Thermo-dynamics	16	A very important branch of Physics that discusses basically, the interaction between mechanical and thermal energy. The zero'th, the first and the	Chalk and Talk	This section forms the basis of Thermal Physics. Finds huge application in studying the properties of solids, liquids, gases and

		second law of Thermodynamics are discussed, together with their applications. The concept of 'entropy' is introduced and the properties are studied		even radiation. Useful in relating different physical quantities. Applicable in various engineering problems (e.g., designing heat engines or coolers).
Thermo-dynamic Potentials	10	Different Thermodynamic potentials (e.g., Gibb's and Helmholtz' free energy) are introduced and their properties are learned. The four Maxwell relations relate the derivatives of entropy with those of the state-variables. These relations are proved and their applications are studied. The phenomenon of Phase transition is studied.	Chalk and Talk	The Thermodynamic potentials are state functions and their derivatives generate useful thermodynamic quantities. The Maxwell equations are very important results and prove to be very useful tools in deriving Thermodynamic identities. Important results related to Phase transition are discussed and the basic techniques of low temperature generation is learned.
Kinetic Theory of gases	16	A gas is viewed as a collection of molecules and with some simplifying assumptions, the expressions of various physical quantities like pressure, temperature, conductivity, etc. are expressed in terms of molecular parameters.	Chalk and Talk	The behavoiur of an ideal gas and also the real gasses are explained on the basis of the kinetic molecular model.
Conduction of Heat	3	'Fourier Heat Equation' is established and solved for a particular geometry.	Chalk and Talk	Conduction is one of the three mechanisms of heat transport and Fourier heat equation is the basic equation governing flow of heat by conduction. The equation is established and the solution is sought in the simple case of rectilinear flow.

Thermal Physics (Practical)

Paper : PHS-A-CC-3-6-P

Credits: 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Verification of Stefan's law using a torch bulb	2	To verify the T^4 law of radiation.	Practical	To demonstrate Stefan's law of black body radiation, to note the departure from a perfect black body and also to learn the technique of determining temperature from a calibration curve.
Determination of the co-efficient of thermal expansion of a metallic rod using optical lever.	2	To find the coefficient of linear expansion of a solid.	Practical	To study thermal expansion of solids and also to learn the use of an optical lever.
Calibration of a thermo-couple by direct measurement of the thermo-emf using operational amplifier and the constants.	2	To study thermo-electric (Seebeck) effect and draw the temperature – thermo emf curve.	Practical	To be familiar with thermo electric effects and also the use of OP AMP to amplify and measure a small voltage.
Calibration of a thermo-couple by direct measurement of the thermo-emf using potentiometer and the constants.	2	To study Seebeck effect and draw the temperature – thermo emf curve.	Practical	To be familiar with thermo electricity and also the use of potentiometer for measurement of small voltages.
Calibration of a thermo-couple and determination of boiling point of water.	2	To find the boiling point of water using thermo-electric effect.	Practical	To learn to determine an unknown temperature by measuring the thermo-emf.
To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method.	2	To determine the coefficient of thermal conductivity of a bad conductor provided in the form of a thin disc.	Practical	To study the mechanism of heat conduction. Learning to take care of the radiation correction while measuring conductivity.
To determine the temperature coefficient of resistance by Platinum Resistance Thermometer	2	To study the variation of the resistance of a Platinum Resistance Thermometer using a Wheatstone bridge Network.	Practical	Learning the use of Platinum resistance thermometer and also to study the variation of resistance with temperature.

Semester – 3 : Digital system and Application

Digital System and Application (Theory)

Paper : PHS A-CC-3-7-TH

Credits: 4

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Integrated Circuits	4	An integrated circuit, or IC, is small chip that can function as an amplifier, oscillator, timer, microprocessor, or even computer memory. An IC is a small wafer, usually made of silicon, that can hold anywhere from hundreds to millions of transistors, resistors, and capacitors.	Chalk and Talk	The integrated circuit uses a semiconductor material (read chips) as the working table and frequently silicon is selected for the task. Afterwards, electrical components such as diodes, transistors and resistors, etc. are added to this chip in minimized form.
Digital Circuits	5	A digital circuit is a circuit where the signal must be one of two discrete levels. Each level is interpreted as one of two different states (for example, on/off, 0/1, true/false). Digital circuits use transistors to create logic gates in order to perform Boolean logic.	Chalk and Talk	Every digital product, including personal computers, mobile phones, tablets, calculators and digital watches also uses logic gates.
Boolean Algebra	5	Boolean algebra is a division of mathematics which deals with operations on logical values and incorporates binary variables. Boolean algebra traces its origins to an 1854 book by mathematician George Boole. The distinguishing factor of Boolean algebra is that it deals only with the study of binary variables.	Chalk and Talk	Boolean Algebra is used to analyze and simplify the digital (logic) circuits. It uses only the binary numbers i.e. 0 and 1.
Data Processing circuits	5	Data is information that has been translated into a convenient form to process Data-Processing circuits are logic circuits that process binary data. Such logic circuits may be Multiplexer(also known as MUX), De-Multplexer, Encoder, Decoder or Exclusive-OR Gate.	Chalk and Talk	Data processing, Manipulation of data by a computer. It includes the conversion of raw data to machine-readable form, flow of data through the CPU and memory to output devices, and formatting or transformation of output. Any use of computers to perform defined.

Circuits	3	In digital circuit theory, combinational logic (sometimes also referred to as time-independent logic) is a type of digital logic which is implemented by Boolean circuits, where the output is a pure function of the present input only. ... In other words, sequential logic has memory while combinational logic does not.	Chalk and Talk	Combinational logic is used in computer circuits to perform Boolean algebra on input signals and on stored data.
Sequential Circuits	3	In digital circuit theory, sequential logic is a type of logic circuit whose output depends not only on the present value of its input signals but on the sequence of past inputs, the input history as well. ... That is, sequential logic has state (memory) while combinational logic does not.	Chalk and Talk	The sequential circuits use current input variables and previous input variables which are stored and provides the data to the circuit on the next clock cycle •As a counter, shift register, flip-flops. •Used to build the memory unit. •As programmable devices (PLDs, FPGA, CPLDs.
Timers	4	The 555 timer IC is an integrated circuit (chip) used in a variety of timer, pulse generation, and oscillator applications. The 555 can be used to provide time delays, as an oscillator, and as a flip-flop element.	Chalk and Talk	The 555 timer chip is extremely robust and stable 8-pin device that can be operated either as a very accurate Monostable, Bistable or Astable Multivibrator to produce a variety of applications such as one-shot or delay timers, pulse generation, LED and lamp flashers, alarms and tone generation, logic clocks, frequency.
Shift Registers	4	A register that is designed to allow the bits of its contents to be moved to left or right.	Chalk and Talk	Shift register is used as Parallel to serial converter, which converts the parallel data into serial data. ...
Counters (4 bit)	4	A counter is a digital sequential logic device that will go through a certain predefined states (for example counting up or down) based on the application of the input pulses.	Chalk and Talk	Counter is a digital device and the output of the counter includes a predefined state based on the clock pulse applications.

Computer Organization	5	Computer Organization refers to the level of abstraction above the digital logic level, but below the operating system level. ... A closely related term, computer architecture, emphasizes the engineering decisions and tradeoffs that must be made in order to produce a "good" design.	Chalk and Talk	Computers help in research, production, distribution, marketing, banking, team management, business automation, data storage, employees management and very helpful to increase the productivity in lower cost, less time with high quality. That's why the use of the computer is important in business.

Digital System and Applications (Practical)

Credits: 2

Paper : PHS-A-CC-3-7-P

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
To design OR & AND logic with diode and resistor. Basis logic gates with transistors. To verify the logics by any type of universal gate NAND / NOR.	4	To verify basic gate with diode and transistor and to prove NAND/NOR as universal gate.	Practical	Logic get are verified using DL(DIODE LOGIC) & TTL(TRANSISTOR TRANSISTOR LOGIC) . NAND &NOR are universal gate.
Formation of different combinational problems by construction of Truth Table and implementation using basic logic gates.	2	Design of combinational with basic gates By using DE MORGAN'S THEOREM & KARNAUGH MAP.	Practical	Any combinational circuit can be constructed using basic gates.
Construction of half adder and full adder.	2	Design of digital adder circuit using basic gate and to verify the truth table.	Practical	To study truth table of basic Binary Adder circuit constructed from standard AND and Ex-OR gates allowing us to "add" together two single bit binary numbers, A and B.

Construction of half subtractor, full subtractor, adder –subtractor using full adder IC.	2	Design of half and full subtractor using full adder IC7483.	Practical	To study the truth table of Binary Subtractor and to establish a decision making circuit that subtracts two binary numbers from each other, for example, X – Y to find the resulting difference between the two numbers.
Construction of FF circuits with NAND gates.	2	Design of FF circuit using NAND gate.	Practical	SR & JK FF circuit are verified and advantage of JK over SR is established.
Construction of 4-bit shift registers with D type FF IC	2	Design of 4 bit shift register using D –FFIC.	Practical	This sequential device loads the data present on its inputs and then moves or "shifts" it to its output once every clock cycle, hence the name Shift Register.
Construction of astable multivibrator using 555 Timer.	2	Design of astable multivibrator circuit using IC 555 timer for production of free running square wave.	Practical	555 timer IC in an Astable mode to produce a very stable Oscillator circuit for generating highly accurate free running waveforms whose output frequency can be adjusted by means of an externally connected RC tank circuit consisting of just two resistors and a capacitor.

Semester – 3 : Skill Enhancement Course

SEC-A: Electrical Circuits and Network Skills

Electrical Circuits and Network Skills - (Theory) Credits : 2

Paper: PHS-A-SEC-A-TH

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Basic Electricity Principles	2	The basic definitions, basic laws and basic instruments of current electricity are discussed.	Chalk and Talk	Recapitulation of earlier knowledge regarding current electricity.

Understanding electrical circuits	2	The basic rules of analyzing DC and AC Circuits are learnt.	Chalk and Talk	To lay the foundation of DC and AC circuit analysis. Learning the complex number representation of AC.
Electrical drawing and symbols	2	Different types of circuits, and their representations are explained.	Chalk and Talk	To learn the basic rules of drawing and following an electrical circuit.
Generators and Transformers	2	DC and AC power sources and the operation of Transformers are discussed.	Chalk and Talk	To learn about the basic ways of feeding energy to a DC /AC circuit.
Electric Motors	3	The basic design and principles of DC and single / multi phase AC motors are explained.	Chalk and Talk	A motor is a device that generates movement utilizing electrical energy. Here we learn about their design and performance.
Solid-State Devices	2	Different solid state circuit elements like resistors, capacitors, diodes etc., are introduced.	Chalk and Talk	The use of semiconductor circuit elements is all-pervading in today's world. Some of these basic elements are described.
Electrical Protection	3	The devices that are used to protect a circuit in different ways are introduced.	Chalk and Talk	Providing protections from surge, short-circuit, etc., are very important in circuit designing. Some of these protective measures are discussed.
Electrical Wiring	3	Different types of cables, measuring instruments, accessories are introduced.	Chalk and Talk	The basic elements of electrical wiring are learnt.

LEARNING MODULE FOR BSC GENERAL

SUBJECT- PHYSICS

Semester – 3 : Thermal Physics and Statistical Mechanics

Thermal Physics and Statistical Mechanics (Theory)

Paper: PHS-G-CC-3-3-TH

Credits: 4

Topic	No. of Classes required	Objective of the topic	Methods of teaching implemented	Outcome
Laws of Thermo-dynamics	12	A very important branch of Physics that discusses basically, the interaction between mechanical and thermal energy. The zero'th, the first and the second law of Thermodynamics are discussed, together with their applications. The concept of 'entropy' is introduced and the properties are studied	Chalk and Talk	This section forms the basis of Thermal Physics. Finds huge application in studying the properties of solids, liquids, gases and even radiation. Useful in relating different physical quantities. Applicable in various engineering problems (e.g., designing heat engines or coolers).
Thermo-dynamic Potentials	10	Different Thermodynamic potentials (e.g., Gibb's and Helmholtz' free energy) are introduced and their properties are learned. The four Maxwell relations relate the derivatives of entropy with those of the state-variables. These relations are proved and their applications are studied. The phenomenon of Phase transition is studied.	Chalk and Talk	The Thermodynamic potentials are state functions and their derivatives generate useful thermodynamic quantities. The Maxwell equations are very important results and prove to be very useful tools in deriving Thermodynamic identities. Important results related to Phase transition are discussed and the basic techniques of low temperature generation is learned.
Kinetic Theory of gases	12	A gas is viewed as a collection of molecules and with some simplifying assumptions, the expressions of various physical quantities like pressure, temperature, conductivity, etc. are expressed in terms of molecular parameters.	Chalk and Talk	The behaviour of an ideal gas and also the real gasses are explained on the basis of the kinetic molecular model.
		Planck's law concerning energy		Planck's law of black body radiation marks the

Theory of Radiation	4	distribution in black body radiation is derived and other laws like Wien's law, Stefan's law etc., are obtained as corollaries.	Chalk and Talk	starting point of Quantum Physics. The particle nature of light is understood in this section.
Statistical Mechanics	10	The basic concepts of Statistical Mechanics are explained. The three distribution functions, viz., Boltzmann, Fermi and Bose are stated and their consequences are discussed.	Chalk and Talk	A macroscopic body is viewed as a collection of particles and rules of statistics are applied. The expressions for different thermodynamic variables are obtained (as average values) as outcome.

Thermal Physics and Statistical Mechanics (Practical)

PHS-G-CC-3-3-P

Credits: 2

Topic	No. of Classes required	Objective of the topic	Strategy of teaching implemented	Outcome
Determination of the co-efficient of thermal expansion of a metallic rod using optical lever.	2	To find the coefficient of linear expansion of a solid.	Practical	To study thermal expansion of solids and also to learn the use of an optical lever.
Verification of Stefan's law of radiation by the measurement of voltage and current of a torch bulb glowing it beyond draper point.	2	To verify the T^4 law of radiation.	Practical	To demonstrate Stefan's law of black body radiation, to note the departure from a perfect black body and also to learn the technique of determining temperature from a calibration curve.
Calibration of a thermo-couple by direct measurement of the thermo-emf using operational amplifier.	2	To study thermo-electric (Seebeck) effect and draw the temperature – thermo emf curve.	Practical	To be familiar with thermo electric effects and also the use of OP AMP to amplify and measure a small voltage.
To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method.	2	To determine the coefficient of thermal conductivity of a bad conductor provided in the form of a thin disc.	Practical	To study the mechanism of heat conduction. Learning to take care of the radiation correction while measuring conductivity.
To determine the temperature coefficient of resistance by Platinum Resistance Thermometer	2	To study the variation of the resistance of a Platinum Resistance Thermometer using a Wheatstone bridge Network.	Practical	Learning the use of Platinum resistance thermometer and also to study the variation of resistance with

				temperature.
Determination of the pressure coefficient of air using Jolly's apparatus.	2	To study the variation of pressure of a gas (assumed ideal) with temperature.	Practical	Regnault's law states that (under the ideal gas approximation), the pressure of a gas should vary linearly with the temperature. Here we seek the experimental proof of this law also determine the pressure coefficient.

Name of the Teacher : Aparajita Guha **Dept. of English** **LEARNING MODULE** CC-2 &1 Sem.-I English (Hons.)

Objectives	Topic	Classes required	Strategy and Methodology	Outcome
To make students aware of epic as a genre and its characteristics with special ref. to Homer the Iliad	**CC-2** Homer's The Iliad Book I and II	15	Traditional method of explaining the poem and then group discussion and question answer session.	Studentslearn about the great epic writers and the genre epic. They get motivated to learn more about poetry.
The students learn about tragedy and its characteristic with special reference to the Greek tragedians.	**CC-2** Sophocles Greek tragedy King Oedipus		Traditional method of teaching what tragedy do; the difference between tragedy and comedy followed by group discussion and question answer session	Students learn about a new genre – the Greek tragedy. They get interest in different types of literature.
To make students aware of old English literature – the oral tradition and the old English manuscripts.	**CC-1** The Anglo Saxon Period & the Middle Ages.	10	Traditional method of teaching the important events of the age, followed by group discussion and question answer session.	Students learn about ancient English Literature. They become aware of the social events, political events of the age.

Signature of the Teacher : A. Guha

PRINCIPAL

Name of the Teacher : Aparajita Guha **Dept. of English LEARNING MODULE** CC-5/6/7 Sem.-III English (Hons.)

Objectives	Topic	Classes required	Strategy and Methodology	Outcome
To make students aware of modern American Literature and American Playwrights.	**ENGA CC-5** The death of a Salesman- play written by American Playwright Author Miller	15	Traditional method of imparting knowledge on the playwright and play in details and their group discussion and question answer session.	Students become acquainted with modern American literature and have a knowledge of modern drama.
To make students aware of children Fiction – a sequel to Alice's adventure in wonderland.	**ENGA CC-6** Through the Looking Glass – a novel by Lewis Carroll.	15	Reading the novel part by part and then discussing about the fantastical world and discussing how close it is to reality, followed by question answer session.	Students learn about the fantastical world of Alice and they get inspired to know more about the world of fantasy.
To make the students comprehend what a much epic is and its difference from epic in general.	**ENGACC-7** Rape of the Lock by Pope, the first 3 cantos.	12	Highlighting on the mock epic genre and then discussing its characteristics with ref. to Alexander Popes the Rape of the Lock	Students learn about a new genre of poetry the mock epic. They come to know about the 18th century society.
To make the students aware of a new genera of poetry – the epic and high light the characteristic and tell them about the epic hero.	**ENGA CC-7** Paradise lost BK I by John Milton.	12	To read the poem by parts and to highlight the qualities of the hero – Satan in BK I and then have a question answer session.	Students learn a lot about Milton – his blindness and his great epic creation – Paradise Lost.

Signature of the Teacher : A. Guha

PRINCIPAL

Dept. of English

Learning Module: Semester I & III

Name of the teacher: Dr. Ranabir Lahiri

Semester I:

Topic	General Objective	Strategy	No. Of classes required	Outcome
Sem. I: Romantic Age	To help the students to understand the salient features of romantic movement, Influence of French Revolution- development of lyrical poetry- Wordsworth, Coleridge, Shelley Keats Byron- development of novel- Scott and Jane Austen- romantic prose and essays	Discussion Interaction Class test	05	Students are made aware of the French revolution at the background and its effect on literature. They will also understand the romantic sensibility of the poets and the novelists.
Ovid: Metamorphosis	To get the students acquainted with classical myths	Discussion Interaction Class test	05	Students will be able to locate the classical tales in contemporary reality by exploring their psychological significance

Semester III:

Topic	General Objective	Strategy	No. Of classes required	Outcome
Sukumar Ray: *Abol-Tabol*	To give the students the pleasure of reading *Abol-Tabol* in translation	Discussion Interaction Class test	04	Students will be able to find sense out of nonsense rhymes
Ernest Hemmingway: *The Old Man and the Sea*	To give a brief account of the development of the American novel and Hemmingway's place in it	Discussion Interaction Class test	05	Students will be able to understand Hemmingway both in the tradition of American fiction and his own fictional universe
Edgar Allan Poe: *Purloined letter*	To locate Poe in the tradition of the genre(short story)	Discussion Interaction Class test	04	Students will have a better understanding of the detective narrative with reference to the story with special focus on psychology

Name of the teacher: Abhishek Samanta

Learning Module: Semester I & III

Semester, I

Topic	General Objective	Strategy	No. Of classes required	Outcome
Sem.I: Elizabethan sonnets, University Wits and Ben Jonson	To help the students to understand the salient features of the 'first romantic age' of literature	Discussion Interaction Surprise test University questions and their appropriate answers explained	05	Students developed an interest in one of the most important periods of English literature and they also develop an interest in Ben Jonson and his age
Modern novel, Modern poetry and Modern drama	To help the students understand modern sensibility in literature	Discussion Interaction Class test	05	Students are interested in the modern age and the modern trends in literature- literature between the wars and after the second world war
Philology (Section 1& 2)	To make the students aware of the history of the language	Discussion Interaction Class test	08	Students will learn about different influences affecting the language and Students will show interest in the new concepts about language
Plautus: ***Pot of Gold***	To give the students an idea of classical Roman comedy	Discussion Interaction Class test	06	Students will learn about the nuances of classical comedy and enjoy the comic sensibility

Semester III:

Topic	General objective	Strategy	No. Of classes required	Outcome
American Poetry (Robert Frost, Walt Whitman, Sylvia Plath, Langston Hughes, Edgar Allan Poe)	To describe the political and cultural context of American literature as well as American poetry and To give an idea of the background, both historical and literary that shaped Walt Whitman, Robert Frost, Sylvia Plath, Langston Hughes, Edgar Allan Poe as major voices of American poetry.	Discussion Interaction Class test	10	Students will be able to understand the American poetry in general and the contribution of the individual poets in particular
Agatha Christie: ***The Murder of Roger Ackroyed***	To give the students an idea of the origin and development of the genre of detective fiction and Agatha Christie's contribution to it	Traditional lecture Interactive method Film shows	08	Students will develop an interest in detective fiction and enjoy the nuances of Christie's wonderful tale
John Webster: ***The Duchess of Malfi***	To give the students an idea of Jacobean drama and the tradition of revenge tragedy	Traditional lecture Interactive method Film shows	08	Students will be able to understand the chief features of Webster's dramatic art and appreciate the text accordingly
Skill Enhancement Elective: Business Communication	To give the students the idea of effective communication and show them different ways of formal and informal correspondence	Discussion Interaction Surprise test University questions and their appropriate answers explained	06	Students will develop the skill of writing formal and informal letters as well as E-mail

Dept. of English

Learning Module: Semester I & III

Name of the teacher: Samayita Dasgupta

Topic	Objective	No. Of Classes Required (approx.)	Method	Intended Outcome
Restoration Comedy of Manners and Eighteenth Century Novels (CC1, Section – 1, Unit – C)	To give a brief idea about the socio-political history of the time period. To explain the concept of 'Comedy of Manners' and its features with respect to the time period it belongs to. To give a concise idea about the authors, their works and writing style. To make them understand the stylistic and structural differences between the different genres and sub-genres. Important terms like 'epistolary', 'picaresque', 'bildungsroman' etc.	6	Lecture Method, Discussion and Interaction, Brainstorming	Students are expected to observe and analyse the difference in the writing styles of each author. They would be able to understand possible connections between the socio-political climate of the time and the kind of literature produced during the period. Students will not only learn about the sub-genres of fiction but also learn in detail about the practitioners of those sub-genres and their work.
"The Crack-up" by F.Scott Fitzgerald; "Dry September" by William Faulkner (CC5)	To give them a brief idea about the nature and structure of a short story. Explaining the text of the stories in detail with brief introduction on the authors and the time they belonged to.	4	Discussion, Interaction after each lecture.	Students will get some idea about how short story emerged as a form of writing, in the canon of American literature.
Tintin in Tibet by Herge (CC6)	A very short introduction on Childrens' Literature, concept of 'nonsense literature'. To give them some idea about the structure, nature and style of 'Comics'. Discuss the text in considerable detail, its themes and other issues.	4	Use of ICT-showing slides explaining nature of comics; and little videos of *Tintin* movies. Discussion and interaction.	Students will be able to understand the difference between Graphic Novels and Comics. The topic is expected to absorb their attention and thus influence them to become more observant about the different genres of texts they are studying and the subtle differences in

				their style, structure and point of view.
The Rover by Aphra Behn (CC7)	To give them a brief introduction on the playwright and her writing style with reference to the time she belonged to. To discuss important themes of the text	4	Play reading of certain parts from the text, Discussion, Interaction.	The students will be able to relate their previously formed concept of 'Restoration Comedy of Manners' with the nature and style of the text.
Sultana's Dream by Rokeya Sakhawat Hossain (GE3)	To give them brief introduction on Feminism, Gender Roles etc; Brief introduction of the author. Thematic discussion of the text	6	Discussion Method, Interaction, Debates	Students will come to understand and analyse the nature of feminist writing, feminist point of view
Bravely Fought the Queen by Mahesh Dattani (Paper - VIII)	To give them a brief idea about Indian English Drama. To give them an idea about the singular style and techniques of Mahesh Dattani, pertaining to stagecraft and themes of his plays.	10 - 12	Play reading in class, Brainstorming, Discussion	Students will be able to form some idea about the Indian stage and the quintessential features of Indian English drama. They will be able to understand the differences in approach pertaining to playwriting in Indian English Drama with respect to British Drama. They will learn to criticise the individual style of Mahesh Dattani as a playwright.

Name of the teacher : BarshaLahiri **Dept. of Political Science LEARNING MODULE CC-5 Sem.-III Pol. Science (Hons.)**

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
(CC-5) **Paper–Indian Political Thought** 1. Ancient Indian political ideas: Overview 2. Koutilya – Saptanga theory, Dandaniti, Diplomacy. 3. Medieval political thought in India overview. (Reference Barani, Abul Fazal) legitimacy of Kingship. 4. Principle of Syncretism. 5. Modern Indian thought Rammahan Ray, his views of liberalism, rule of law, freedom of thought, social justice. 6. Bankim Chandra Chattopadhyaya, Vivekananda, and Rabindranath, views on nationalism. 7. M.K. Gandhi views on state, Swaraj, Satyagraha.	To show the students the utility of Indian Political thought. They know about ancient Indian Political ideas, know about Kaulilya, his Saplanga theory Dandanite, Diplomacy. To show the students the utility about Medieval political thought and they know about the principle of syncretism. To show the students the utility of Modern Indian Political thought. They know about the Ideas of Rammohan Ray, Bankim Chandra, Vivekananda, Rabindra Nath and M.K. Gandhi. To gain the knowledge of underlying truth of Indian political thoughts.	6 5 4 5 10	1. Traditional way of Teaching. 2. Interactive classes. 3. Discussion of the Topics. 4. Group Discussion and Debates. 5. Traditional way of teaching, interactive classes discussion on topics.	Students are interested to know the different objects of Indian political thought. They know about ancient period of India, Medieval period of India and modern period of India. They know about Medieval period kingship system and in modern period they know Rammmohan, Bankim Chandra, Vivekananda and Rabindra Nath Tagore's ideas in nationalism. Examinations are also conducted on the papers to assess their progress. Students are very much interactive in this class. Viva test are conducted to check their progress.

Signature of the Teacher :

PRINCIPAL

বিষয়	সাধারণ উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
(CC5) **ভারতীয় রাষ্ট্রচিন্তা :** ১) প্রাচীন যুগের রাষ্ট্রচিন্তার ধারণা তার প্রাসঙ্গিকতা । ২) কৌটিল্য তার সপ্তাঙ্গতত্ত্ব, দন্ডনীতি, কূটনীতি । ৩) মধ্যযুগের রাজনীতি ও রাষ্ট্রচিন্তা, বারানী ও আবুল ফজলের উদাহরণ সহ সামগ্রিক পর্যালোচনা । ৪) প্রাচীন ও মধ্যযুগের মধ্যে সমন্বয় ও তাদের বৈশিষ্ট্যের আলোচনা । ৫) আধুনিক ভারতীয় রাষ্ট্রচিন্তা রামমোহন রায় । তার উদারনীতিবাদ, আইনের অনুশাসন, চিন্তার স্বাধীনতা, সামাজিক ন্যায় বিচার সম্পর্কে পর্যালোচনা । ৬) বঙ্কিমচন্দ্র চ্যাটার্জী, বিবেকানন্দ, রবীন্দ্রনাথ ঠাকুরের জাতীয়তাবাদ সম্পর্কে পর্যালোচনা । ৭) গান্ধীজীর, রাষ্ট্রসম্পর্কে ধারণা, স্বরাজ ও সত্যাগ্রহ সম্পর্কে আলোচনা ।	ভারতবর্ষের রাষ্ট্রচিন্তার সাধারণ উদ্দেশ্য, আমাদের ক্রমবিবর্তন রাজনীতির জগতের ইতিহাসকে জানা, বিভিন্ন সময়ে, বিভিন্ন শাসক দলের শাসন ব্যাবস্থা রাজনীতি কেমন ছিল তা কৌটিল্যের সপ্তাঙ্গতত্ত্ব, দন্ডনীতি ও কূটনীতি থেকে ছাত্রছাত্রীরা যেমন অবগত হবে, মধ্যযুগের শাসন ব্যাবস্থা কেমন ছিল তা জানাবে আবুল ফজল, বারানীর লেখা থেকে । এই দুইয়ের সংমিশ্রনের বৈশিষ্ট্য সম্পর্কেও তারা জানবে । আধুনিক ভারতীয় রাষ্ট্রচিন্তা থেকে তারা রামমোহন, বিবেকানন্দ, রবীন্দ্রনাথ প্রভৃতি মনীষীদের ভাবাদর্শকে জানবে, আবার গান্ধীজীর রাষ্ট্রচিন্তা থেকে জানবে রাষ্ট্রের স্বরূপ, সত্যাগ্রহ থেকে জানবে, আন্দোলনের স্বরূপ সম্পর্কে ।	৬ ৫ ৪ ৫ ১০	প্রধানত বর্ণনা মূলক পদ্ধতি অনুসরণ করা হয় । এছাড়া রাষ্ট্রব্যাবস্থার সাথে তুলনার ভিত্তিতে আলোচনা করা হয় । ও প্রাচীন উদাহরণ, ইতিহাসের সাহায্যে আলোচনা করা হয় । এছাড়া কোন দলগত ভাবে ছাত্রছাত্রীদের কোন বিষয়ে মতামত নিয়ে আলোচনা করা হয় । কখনো বিতর্কের মাধ্যমে আলোচনা করে পড়ানো হয় । এছাড়া গতানুগতিক পদ্ধতি ও প্রশ্নোত্তর পদ্ধতি, প্রয়োজনমত ব্যবহার করা হয় । গতানুগতিক পদ্ধতি, প্রশ্নোত্তর পদ্ধতি এবং মুখস্থ পড়া লিখতে দিয়ে, সেগুলি সঠিক কিনা এবং মনীষীদের ভাবাদর্শ কতটা প্রযোজ্য বর্তমানে তা আলোচনা করা হয় ।	ভারতীয় রাষ্ট্রচিন্তা - এর মাধ্যমে ছাত্রছাত্রীরা ভারতবর্ষের ঐতিহ্য রাজনৈতিক গরিমা সম্বন্ধে জ্ঞান লাভ করবে । তারা জানতে পারবে, শাসন, বিচার, আইন এইসব দিক দিয়ে ভারতবর্ষ কত উন্নত ছিল । ভারতবর্ষ উন্নত দেশ ছিল বলেই বিদেশী আক্রমন বারবার ঘটেছে । আধুনিক যুগের মনীষীরা তাদের চিন্তায় ও ভাবনায় যে কত উন্নত ছিলেন । তাই তাদের ভাবাদর্শ আজও সমান ভাবে গ্রহণ যোগ্য হবে । নিজ দেশের মণীষীদের ধ্যানধারণা সম্পর্কে জানার ফলে নিজরাষ্ট্র,, দেশ সম্পর্কে ইতিবাচক মনোভাব গড়ে উঠবে ।

শিক্ষিকার স্বাক্ষর :

অধ্যক্ষা :

Department of Chemistry
Name of Teacher : Dr Anindita Mukherjee
LEARNING MODULE: Semester-III(Hons)

Name of topic	Number of classes required	Objective of the topic	Teaching methods followed	Outcome
Chemistry of alkenes and alkynes- Addition to C C, Addition to C C	15	To study the reaction mechanism of a specific kind of reaction called addition which also helps us to understand why certain products are more likely to form than others. To know the pathway of various chemical reactions in order to know the type and nature of products and to compare the yield of different products obtained from same reaction with different mechanism	Chalk and talk, preparing lesson plan, use of internet through smart phone to get latest information about the topic, demonstration by showing ball and stick model, preparing colourful charts containing important reactions. Microteaching and group discussion .	Knowledge about reaction mechanism helps us to prepare different kind of products from various organic reactions. The production of many man-made chemicals such as drugs, plastics, food additives, fabrics depend on organic reactions. Helpful in higher studies and research works.
Carbonyl and Related Compounds - *Iddition to C O*	10	To give general overview of four different reaction mechanisms that dominate carbonyl group chemistry. To identify the various types of carbonyl compounds,important difference between aldehyde and ketone. To study various reactions involving carbonyl group which is very useful in various organic synthesis.	,,	Knowledge about the wide variety of biologically important,pharmaceutical and industrial compounds that contain one or more carbonyl groups. Should be able to understand detailed mechanism of nucleophilic addition reaction, condensation reactions involving carbonyl group which will be helpful in different organic syothesis and further research work.
Nucleophilic addition to α,β-unsaturated carbonyl system	05	To understand the general mechanism to illustrate addition reaction of a nucleophile to the carbonyl group of a aldehyde or ketone.	,,	The reactions can be used in the biological synthesis of compounds in the metabolism of every living organism, and are used by chemists in academia and industries such as pharmaceuticals to prepare new complex organic chemicals and so are central to organic chemistry.

Name of the Teacher : Angira Sen **Dept. of History** **LEARNING MODULE** **Sem.-I** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
(CC-1)				
1. Early Indian notions of History	The students must be aware of the interpretation of History.	2	Traditional Method	Students were keen on knowing about the interpretation.
2. Sources of History	Students must know about the various sources of History.	5	Interaction Method	Students were interested in knowing about the various sources of History.
(CC –II)				
1) Palaeolithic & Mesolithic cultures of the ancient world.	The students must be aware of Palaeolithic & Mesolithic culture.	5	Traditional Method	Students were keen on knowing about the Palaeolithic & Mesolithic culture
2) Role of Kinship.	The students must come to know about the term Kinship.	5	Interaction Method	Students were keen on knowing about the role of Kinship.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher : Angira Sen **Dept. of History** **LEARNING MODULE** **Sem.-III** History (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
(CC-V) 1. Political achievements of Rastrakutas, Palas, Pratiharas, Rajputs & Cholas.	The students must be aware of the different political achievements of the rulers of these dynasties.	10	Traditional Method	The students were interested in knowing the political as well as administrative achievements of the different rulers.
2. Arab Conquest of Sindh.	Students must know about the nature & impact of the Arabs.	5	Interactive Method	The students were very keen to about the history of the Muslim invaders & its impact on India.
3. Causes & consequences of early Turkish invasions.	Students must know about the Turkish invaders and their achievements.	5	Traditional Method	The students came to know about the history of Turkish rulers & their achievements.
(CC –VI) 1) Commercial Revolution	The students must be aware of the commercial revolution of Europe.	2	Traditional Method	The students were interested in knowing the revolution that took place in the Commercial world.
2) Price Revolution	The students must know about the Price Revolution of Europe.	5	Interactive Method	The Students are keen to know about the hike of prices in Europe.
3) Enclosure Movement	The students must be aware of the Enclosure movement that took place in Europe	5	Interaction Method	The students came to know about the word Enclosure, its importance in Europe & the related movements concerning Enclosure.
(CC – VII) 1. Sufi Literature.	The students must be aware of the books written by the Sufi saints.	4	Traditional Method	Students were keen to know about the literary works of the Sufis.
2. Architecture of the Delhi Sultanate	The students must be come to know about the Architecture built by the Delhi Sultans.	10	Interactive Method	The students were interested in knowing the cultural achievements of the Delhi Sultans.

Signature of the Teacher : Angira Sen

PRINCIPAL

বিষয়	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
প্রথম পত্র				
১। ইতিহাস সম্পর্কে ধারণা	২	ছাত্র-ছাত্রীদের ইতিহাসের ধারণা সম্পর্কে অবহিত করে ।	গতানুগতিক বর্ণনামূলক পদ্ধতি	ছাত্র-ছাত্রীরা ইতিহাস সম্পর্কে সঠিক জ্ঞান লাভ করতে পেরেছে ।
২। ইতিহাসের উৎস	৫	ছাত্র-ছাত্রীদের ইতিহাসের বিভিন্ন উৎস সম্পর্কে অবহিত করে ।	গতানুগতিক বর্ণনামূলক পদ্ধতি	ছাত্র-ছাত্রীদের ইতিহাসের বিভিন্ন উৎস সম্পর্কে জ্ঞান লাভ করতে পেরেছে ।
দ্বিতীয় পত্র				
১। পুরাতণ প্রস্তর যুগ ও মধ্যপ্রস্তর যুগ (প্রাচীন বিশ্বে)	৫	প্রস্তর যুগের ইতিহাস সম্পর্কে ছাত্র-ছাত্রীদের অবহিত করে ।	গতানুগতিক বর্ণনামূলক পদ্ধতি	ছাত্র-ছাত্রীরা প্রস্তর যুগের ইতিহাস সম্পর্কে সঠিক জ্ঞান লাভ করতে পেরেছে ।
২। আত্মীয়তার ভূমিকা	৫	ইতিহাসে আত্মীয়তার ভূমিকা সম্পর্কে ছাত্র-ছাত্রীদের অবহিত করে ।	গতানুগতিক বর্ণনামূলক পদ্ধতি	ইতিহাসে আত্মীয়তার ভূমিকা সম্পর্কে জ্ঞান লাভ করতে পেরেছে ।

শিক্ষিকার স্বাক্ষর : Vijaygarh Jyotish Ray College

অধ্যক্ষা :

বিষয়	প্রয়োজনীয় ক্লাস সংখ্যা	সাধারণ উদ্দেশ্য	পদ্ধতি	কাঙ্খিত ফল
পঞ্চম পত্র ১) রাষ্ট্রকূট, পাল, প্রতিহার, রাজপুত, চোলদের রাজনৈতিক কৃতিত্ব	১০	ছাত্র-ছাত্রীদের বিভিন্ন রাজাদের রাজনৈতিক কৃতিত্ব সম্পর্কে অবহিত করে ।	গতানুগতিক বর্ণনামূলক পদ্ধতি	ছাত্র-ছাত্রীরা বিভিন্ন বংশের ইতিহাস সম্পর্কে জ্ঞান লাভ করতে পেরেছে ।
২) সিন্ধুর আরব অভিযান	৫	ছাত্র-ছাত্রীদের আরব অভিযান সম্পর্কে অবহিত করে ।	বিতর্কমূলক পদ্ধতি	ছাত্র-ছাত্রীদের আরব অভিযান সম্পর্কে জ্ঞান লাভ করতে পেরেছে ।
৩) তুর্কী অভিযান	৫	ছাত্র-ছাত্রীদের তুর্কী অভিযান সম্পর্কে অবহিত করে ।	বিতর্কমূলক পদ্ধতি	ছাত্র-ছাত্রীদের তুর্কী অভিযান সম্পর্কে জ্ঞান লাভ করতে পেরেছে ।
ষষ্ঠপত্র ১) বাণিজ্যিক বিপ্লব	২	• বাণিজ্যিক বিপ্লব সম্পর্কে ছাত্র-ছাত্রীদের অবহিত করে ।	বিতর্কমূলক পদ্ধতি	ছাত্র-ছাত্রীরা ইতিহাসে বাণিজ্যিক বিপ্লব, মূল্য বিপ্লব, এনক্লোজার ব্যবস্থা, সুফী সাহিত্য, দিল্লী সুলতানদের স্থাপত্য ইত্যাদি বিষয় সম্পর্কে জ্ঞান লাভ করতে পেরেছে ।
২) মূল্য বিপ্লব	৫	• মূল্য বিপ্লব সম্পর্কেছাত্র-ছাত্রীদের অবহিত করে ।	গতানুগতিক বর্ণনামূলক পদ্ধতি	
৩) এনক্লোজার ব্যবস্থা	৫	• এনক্লোজার ব্যবস্থা সম্পর্কে ছাত্র-ছাত্রীদের অবহিত করে ।		
৪) সুফী সাহিত্য	৪	• সুফী সাহিত্য সম্পর্কে ছাত্র-ছাত্রীদের অবহিত করে ।	বিতর্কমূলক পদ্ধতি	
৫) দিল্লী সুলতানদের স্থাপত্য	১০	• দিল্লী সুলতানদের স্থাপত্য সম্পর্কে ছাত্র-ছাত্রীদের অবহিত করে ।		

শিক্ষিকার স্বাক্ষর :

অধ্যক্ষা :

Name of the Teacher :Baisali Roy Chowdhury **Dept. of Philosophy** **LEARNING MODULE** **CC-1,2** **Sem.-I** Philosophy (Gen.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
PHIG (CC-1) C. VaiśeṣikaMetaphysics: Categories–dravya,guna, karma,sāmānya, viśeṣa, samavāya andabhāva.	To impart the knowledge about this Particular system.	20	i) Traditional way of teaching ii) Interactive Discussion of topics	Students will be able to gain deeper knowledge about this system.
PHIG (CC-2) B. Realism: Naive Realism, Locke's Representative, Realism, Subjective Idealism (Berkeley). D. Causality: Entailment Theory, RegularityTheory.	To impart the knowledge about different theories of Western Philosophy.	12 8	i) Traditional way of teaching ii) Interactive Discussion of topics	Students will be able to gain deeper knowledge about thesetheories.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher : Baisali Roy Chowdhury **Dept. of Philosophy** **LEARNING MODULE** **CC-1&2** **Sem.-I** Philosophy(Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
PHIA (CC-1) a) Cārvāka School—Epistemology, Metaphysics,Ethics. b) Jainism—Concept of Sat, Dravya, Paryāya, Guṇa. Anekāntavāda, Syādvāda andSaptabhanginaya. c) Buddhism— Four noble Truths, Theory of Dependent Origination (Pratītyasamutpādavāda), d) Definition of Reality (Arthakriyākāritvamsattvam), Doctrine of Momentariness, (Kṣanabhangavāda),Theoryofno-soul (Nairātmyavāda),FourSchoolsof Buddhism (Basictenets).	To impart the knowledge about these three systems of Indian philosophy.	8 10 14	1) Traditional way of teaching. 2) Interactive discussion on topics	Students will be able to gain deeper knowledge about these three nastika systems of philosophy
PHIA (CC–II) a) Pre Socratic Philosophy: Thales, Heraclitus, Parmenides, Empedocles, Anaxagoras, Democritus,Protagoras. b) Plato: Theory of Knowledge, Theory ofForms. d) St. Thomas Aquinas: Faith and Reason, Essence and Existence.	To impart the knowledge about these three eras of Western Philosophy.	8 10 8	1) Traditional way of teaching. 2) Interactive discussion on topics	Students will be able to gain deeper knowledge about these eras of Western Philosophy.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher :Baisali Roy Chowdhury **Dept. of Philosophy LEARNING MODULE CC-7 Sem.-III** Philosophy (Hons.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
PHIA (CC-7) Philosophy of Religion	To impart the knowledge about these discipline of philosophy.	90	1) Traditional way of teaching. 2) Interactive discussion on topics.	They will be able to gain deeper knowledge about this discipline.

Name of the Teacher : Baisali Roy Chowdhury **Dept. of Philosophy LEARNING MODULE** CC – 3 **Sem.-III** Philosophy (Gen.)

Topic	Objectives	Classes required	Strategy and Methodology	Outcome
PHIG (CC-3) D. Symbolic Logic: Use of symbols, Truth-functions: Negation, Conjunction, disjunction, implication,equivalence. E. Tautology, Contradiction, Contingent statement forms. Construction of truth-table, using truth-tables for testing the validity of arguments and statement forms.	To impart the knowledge about this Particular system.	20	i) Traditional way of teaching ii) Interactive Discussion of topics	Students will be able to gain deeper knowledge about this system.

Signature of the Teacher :

PRINCIPAL

Learning Module

Philosophy Department Sem – II

Objectives	Topics	Classes Required	Methodology	Outcome
To impart the knowledge of Vedanta philosophy	**PHIA –CC-3** **Adwaitya Vedanta Philosophy** Sankara's view of Brahman, Saguna and Nirguna Brahman, Three grades of satta, Jiva, Jagat and Maya	24	1) Traditional way of teaching 2) Interactive discussion on topics.	They will be able to gain deeper knowledge about the subject.
Objectives	**Topics**	**Classes Required**	**Methodology**	**Outcome**
To impart among the students the concept about the philosophy of David Hume	**PHIA – CC – 4** **Philosophy of David Hume** Impression and ideas association of ideas, distinction between judgments concerning relations of ideas and judgments concerning matter of facts, theory of causality, concept of soul and personal identity scepticism.	24	1) Traditional way of teaching 2) Interactive discussion on topics.	They will be able to gain deeper knowledge about the subject

LEARNING MODULE

1st Year (Hons) Sem – II DEPARTMETN OF PHILOSOPHY

OBJECTIVES	TOPICS	CLASSES REQUIRED	METHODOLOGY	OUTCOME
To show the students the utility of Indian. Philosophical system and of gaining the knowledge of underlying truth of Indian Philosophy.	PHIA – A CC 3 INDIAN PHILOSOPHY – II Samkhya Satkaiadyerada. Nature of Prakriti its constitunts and proofs for its existence purusa. Theory of Evolution. Mimamsa. Anvitavidhan vada and Abhititantanvaya vada. Arthapatti and Anupalabdhi as somas of knowledge.	 20 22	(i) Traditional way of teaching (ii) Interactive classes. (iii) Discussion of topics	Students are interested to know the different objects of Indian Philosophical systems. Examinations are also conducted on the paper to assess their progress.

LEARNING MODULE

1st Year (Hons) Sem – II DEPARTMETN OF PHILOSOPHY

OBJECTIVES	TOPICS	CLASSES REQUIRED	METHODOLO	OUTCOME
To impart the knowledge of Western Philosophy and the different works of eminent Western Philosophy	PHIA – CC-4 HISTORY OF WESTERN PHILOSOPHY Berkeley Refutation of Abstract ideas, criticism of Lockes distinction between Primary and Secondary qualities, Immaterialism, Esse-est-percipi, Role of HOD	18	(i) Traditional way of teaching (ii) Interactive classes (iii) Interactive discussion on topics	Students are very much interested to know the history of Western Philosophy

V.J.R.C

Asst. Prof. Mamata Mondal. Learning Module

1st Year (Hons) Sem – II Philosophy Department

CC – 3

Objectives	Topic PHIA	Class required	Methodology	Out come
To important the knowledge of yoga philosophy and Visistadvaita Vedanta Philosophy	Indian Philosophy Yoga Philosphy: Chitta, Chittabhumi, Eight Fold Path of Yoga, God	16	I) Traditional way of teaching II) Inter active classes III) Discussion of the topic	Students are interested to know the different objects of Indian Philosophical systems of Yoga and Visista advita Vedanta examination are also taken
	Visistadvaita Vedanta Ramanujas view of Brahman, Jiva, Jagat, Reputation of the doctrine of Maya	22		
CC-4	**Topic**	**Class required**	**Methodology**	**Outcome**
History of Western Philosophy Objectives To impart knowledge among the students the concept about the Philosophy of Locke	(Locke) Refutation of Innate ideas, The origin and formation of ideas, simple and complex ideas, substance, Modas and Relations, Nature of Knowledge, and its degrees, Limits of Knowledge Primary and Secondary qualities Representative Realism	28	I) Traditional way of teaching II) Interactive discussion on topic	Students will be able to gain deeper knowledge about the subject
To important the knowledge of Western Philosophy and the different works of Kant	Kant (Visiting Faculty) (Moumita Banerjee) Concept of critical philosophy, Distinction between Apriori and Aposferiori Judgements, Distinction between Analytic and Synthetic Judgements, Synthetic Apriori Judgements, General problem of the critique, Copernican Revolution in Philosophy, Transcendental Aesthetic, Space & Time Metaphysical and Transcendental exposition of the Ideas of space & Time	30	(i) Traditional way of teaching (II) Interactive discussion on topic	Students are very much interested to know Kants Philosophy

V.J.R.C

দর্শন বিভাগ: - শিক্ষনের মডিউল - সহকারী অধ্যাপিকা মমতা মণ্ডল

সাম্মানিক স্নাতক প্রথম বর্ষ দ্বিতীয় সেমিস্টার

বিষয়	সাধারণ উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
সি. সি. - ৩ ভারতীয় দর্শণ - যোগ দর্শণ ১) যোগ দর্শণে ঈশ্বরের স্থান ও স্বরূপ। ২) চিত্তবৃত্তি ৩) বিত্তভূমি ৪) অষ্টযোগাঙ্গ	ছাত্রছাত্রীদের যোগ দর্শণের ঈশ্বর, চিত্তবৃত্তি, চিত্তভূমি, ও অষ্টযোগাঙ্গ সম্পর্কে জ্ঞান দান করা। যোগদর্শনের মূল্যবোধ সম্পর্কে তাদের অবহিত করা	১৬	গতানুগতিক, প্রশ্ন উত্তর পদ্ধতি, বর্ণনা মূলক পদ্ধতি অনুসরণ করা হয়।	ছাত্র ছাত্রীদের যোগদর্শন সম্পর্কে অবহিত করা
বিশিষ্টাদ্বৈতবাদ:- ১) রামানুজের মতে ব্রহ্ম, ২) রামানুজের মতে জীব, জগৎ ৩) রামানুজ কর্তৃক শঙ্করের মায়াবাদ খণ্ডন।	ছাত্রছাত্রীদের রামানুজের ব্রহ্ম, জীব ও জগৎ সম্পর্কে অবহিত করা এবং রামানুজ কর্তৃক শঙ্করের মায়াবাদ খণ্ডন সম্পর্কে অবহিত করা।	২২	গতানুগতিক বর্ননামূলক পদ্ধতি অবলম্বন করা হয়।	ছাত্রছাত্রীরা রামানুজের ব্রহ্ম। জী ও জগৎ সম্পর্কে অবহিত হবে এবং অদ্বৈত বাদের মায়াবাদ খণ্ডন করতে শেখা এবং এ সম্পর্কে অবহিত করা।
বিষয়	সাধারণ উদ্দেশ্য	প্রয়োজনীয় সংখ্যা ক্লাস	পদ্ধতি	কাঙ্খিত ফল
সি. সি - ৪ পাশ্চাত্য দর্শণের ইতিহাস:- লক: সহজাত ধারনাতত্ত্ব খণ্ডন, ধারনা উৎস, সরল ধারনা ও জটিল ধারনা, দ্রব্য জ্ঞানের স্বরূপ ও সীমানা জ্ঞানের তিনটি ক্রম, প্রকার বা অবস্থা, মুখ্য গুণ ও গৌণ গুণের পার্থক্য প্রতিরূপী বাস্তবাদ।	ছাত্রছাত্রীদের লকের ধারনা তত্ত্ব, সরল, জটিল ধারনা এবং, জ্ঞানতত্ত্বের স্বরূপ ও ক্রমসম্পর্কে অবগত করা এবং মুখ্যগুণ ও গৌন গুনের মধ্যে প্রভেদ করতে পারা ও প্রতিরূপী বস্তুবাদ সম্পর্কে অবগত করা।	২৮	গতানুগতিক প্রশ্নউত্তর পদ্ধতি ও বর্ণনামূলক পদ্ধতি গ্রহন করা হয়।	ছাত্রছাত্রীরা লকের ধারনা তত্ত্ব সম্পর্কে অবগতহবে , লক কিভাবে সহজাত ধারনা খণ্ডন করেছেন তা জানতে পারবে, লকের দ্রব্য জ্ঞানের স্বরূপ ও সীমানা সম্পর্কে অবগত হবে, মুখ্যগুণ ও গৌণগুনের মধ্যে প্রভেদ করতে শিখবে এবং প্রতিরূপী বস্তুবাদ সম্পর্কে জ্ঞান লাভ করবে।
সি.সি - ৪ পাশ্চাত্য দর্শনের ইতিহাস কান্ট: কান্টের জ্ঞানতাত্ত্বক বিচার বাদের ধারনা, অধিবিদ্যক সমস্যা এবং পূর্বতসিদ্ধ ধারনা, পূর্বতসিদ্ধ জ্ঞানের সমস্যা, পূর্বত সিদ্ধ বিশ্লেষক ও পরতঃসাধ্য সংশ্লেষক বচনের পার্থক্য, অধিবিদ্যা শুদ্ধবুদ্ধি বিচার, সংবেদন শক্তির পূর্বতসিদ্ধ আকার: দেশ ও কাল অধিবিদ্যক যুক্তির ব্যাখ্যা জ্ঞানতাত্ত্বিক ব্যাখ্যা, পূর্বতসিদ্ধ অনুভ রূপে দেশ ও কাল: প্রমান, জ্ঞানরাজ্যে কান্টের কোপানিকীয় বিপণব।	কান্ট: (পরিদর্শক শিক্ষিকা) মৌমিতা ব্যানার্জী জার্মান দার্শনিক কান্টের দর্শন সম্পর্কে ছাত্রছাত্রীদের অবগত করা এবং তাঁর দর্শনকে ছাত্রছাত্রীদের সামনে তুলে ধরা।	৩০	১) গতানুগতিক পদ্ধতি ২) বর্ণনামূলক পদ্ধতি ও ৩) প্রশ্নোত্তর পদ্ধতি অবলম্বন করা হয়।	ছাত্রছাত্রীরা কান্টের দর্শন সম্পর্কে জ্ঞান লাভ করবে এবং প্রশ্নোত্তর দিতে সক্ষম হবে।

Department : BOTANY

LEARNING MODULE FOR B.SC HONOURS course

Choice Based Credit System

Semester II

Core Course: 3 (Theoritical), Credits - 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	beforeOutcome
Anatomy Cellwall, stomata, stele, secondary growth, developmental anatomy, Ecological anatomy	60	To represent the lecture in such way that they can get clear idea of cell,tissue and organ and different development.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector Do	Students get an idea of internal structure of plant, changes the anatomical features in different ecological habitat.

Plant Anatomy (Practical), Credits - 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Work out	12	It is a supplemet to the theoretical classroom. It helos the students to understand the subject more precisely.	Microscope – compound and simple	The students get clear idea about the distribution of tissue and anomaly of tissue
Identification	12			
Class room performance				

Core course 4 (Theoritical) Aechegoniate, Credits - 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Bryophytes	16	It is a small group of primitive thalloid plant with amphibious habit. A simple account of structure, reproduction, functions, relationship of important members of each class have been tried to present before students.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector)	This topic gives idea that they are pioneer of land plants. They have ecological significance as they initiate soil formation on barren land. Students get knowledge how they reproduce asexually and sexually. They have some economic importance.
Pteridophytes	22	To represent the lectures in a reasonably balanced and comprehensive way through the topic that are needed by the students.	Interactive ; Audiovisual(Chart, model, Power point presentation, Overhead projector)	Students can get an idea anout first vascular plant, their structure, reproduction and also usefulness.
Gymnosperms	22	To deliver the lectures in such a way that students get knowledge about the past vegetation and evolution as they were the first seed plant.	Do	They can learn about fooils

Aechegoniate (Practical), Credits - 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Bryophytes	5	To make the topic more interesting by taking practical class. Through excursion the said groups and their natural habitat can be known.	Using compound and simple microscope.	They can see the structure to their own eyes and also get clear idea about the structure, technique for making slide.
Pteridophytes	13			
Gynmnosperm	5			
Field Study	Long Excursion			

Learning Module

Department of Microbiology

Name of faculty: Dr. Sampa Debnath

Sl.N0	Level	Paper	Broad area	Description	Mode of teaching	Learning Outcome
1	Under Graduate. Hons:Semester: III	Microbial Metabolism	Unit 3 Chemoheter otrophic Metabolism -	Aerobic Respiration Concept of aerobic respiration, anaerobic respiration and fermentation Sugar degradation pathways i.e. EMP, ED, Pentose phosphate pathway TCA cycle Electron transport chain: components of respiratory chain, comparison of mitochondrial and bacterial ETC, electron transport hosphorylation, uncouplers and inhibitors	By Power Point presentation, and by application of ICT technique e.g. Google Class Room	Learner can gather the knowledge of biological activity of microorganism in presence of oxygen
			Unit 4 Chemoheter otrophic Metabolism -	Anaerobic respiration and fermentation Anaerobic respiration with special reference to dissimilatory nitrate reduction	By Power Point presentation, and by application of	From this unit learner can the knowledge of biological activity of microorganism in absence of oxygen

				(Denitrification; nitrate /nitrite and nitrate/ammonia respiration; fermentative nitrate reduction) Fermentation - Alcohol fermentation and Pasteur effect; Lactate fermentation (homo fermentative and hetero fermentative pathways), concept of linear and branched fermentation pathways	ICT technique e.g. Google Class Room	
2.	Under Graduate Part III Hons	Paper VII (100 marks) Practical	Enzyme Kinetics	Unit I 1. Isolation and characterization of one industrially important enzyme, immobilization of cells. 2. Determination of Km, Vmax and pH optima. effect of activator. inhibitor of alkaline phosphatase Unit II 1. Protein estimation by Lowry method 2. Absorption spectra of DNA and protein, hyperchromic shift of DNA 3. Phage titration	Hands On Practical	Learner can grow experience of hands on practical which they have learnt in theory classes. Besides these they also can grow some special qualities e.g cooperation and working together.
3	M.Sc Semester I	Micro C15:	Microbial Metabolism	Bacterial photosynthesis (different types of photosynthetic bacteria, photopigments, paths of carbon and electron in bacterial photosynthesis); metabolism of energy reserve	By Power Point presentation, and by application of ICT technique e.g.	Learner can grow the knowledge how microorganism can exist in different environment and this knowledge will help them to protect from

				compounds (polyglycans, -hydroxybutyrate); metabolic energetics: basic differences in anaerobic and respiratoryβpoly- and kinds of energy metabolism; energy conservation in chemolithotrophic bacteria (Nitrobacter, Nitrosomonas, Thiobacilli including Thiobacillus ferrooxidans, methanogens, hydrogen oxidizing bacteria);	Google Class Room	pathogenic organism
4	M.Sc Semester I	Micro S11:	Enzymes and Reaction Kinetics	Practical: Estimation of proteins, enzyme kinetics, effects of pH and temperature on enzyme, use of inhibitors for active site determination, chromatographic techniques, purification of enzymes, chemical estimation of vitamins, minerals like calcium, iron etc, separation of biomolecules by electrophoresis, determination of molecular weight by gel filtration.	Hands on practical	Learner can grow the knowledge of 1. Estimation of protein, 2. Enzyme kinetics 3. Effect of inhibitor on microbial enzyme 4. Different techniques of determination of molecular weight enzyme 5. Besides these they also can grow some

					special qualities e.g cooperation and working together

Department : BOTANY

LEARNING MODULE FOR B.SC HONOURS

SEMISTER - I

Core course 1 Credit 4 (Theoretical)

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Phycology	30	To know about the world of Lower Cryptogams comprising of ancient members of plant population.	Interactive ; Audiovisual, Chart, model, Power point presentation, Overhead projector)	The students get clear idea about the Basic knowledge of Thallophyta specially algae which are the primary producers in aquatic ecosystems.
Microbiology	36	The students have been given information presented in a concise understable formation without excessive frills and diversion.	Do	on successful completion of this topic the students get clear idea about their microbial world, taxonomy, genetics, and their usefulness ..

Practical (BOT-A-CC-1-1-P) Credits 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Algae	13	To make the topic more interesting by taking practical class	Using compound and laminar airflow and autoclave.	they can see the structure to their own eyes and also get clear idea about the structure, technique for making slide and bacterial media preparation and sub culturing
Microbiology	13			

Core course 2 (Theoretical) credit 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Mycology	30	The lectures have been made in such a way that a concise account of fungi to meet the requirement of Botany students.	Do	It deals with study of fungi specially their structure, reproduction, genetics. They are extremely important in industries such as cheese, wine, some of them are edible specially mushroom, some of them produce antibiotic. Many of them also harmful produce toxin
Phyto Pathology	30	This is a science which comprises both the art of treating the sick plant and the science of understanding the nature of the diseased plant. So the lectures are delivered in such a way that students will be interested to this topic.	Do	The students will know about the pathogen, disease concept in plants, some plant diseases, toxin and also disease control.

Practical (BOT-A-CC-1-2-P) credit 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Mycology	13	To make the topic more interesting by taking practical class	Using compound and simple microscope.	They can see the structure to their own eyes and also get clear idea about the structure, technique for making slide and also different plant diseases.
Phytopathology	13			

Semester III

Core course - 5 (BOT –A-CC-3-5-TH (Theoretical) Credit 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Before Outcome
Palaeobotany and Palynology	16	The purpose of this head is to stimulate the interest of students in palaeobotany. However references to review articles and reference books are prescribed so that they can get clear idea of this topic.	Interactive ; Audiovisual Chart, model, Power point presentation, Overhead projector	This is the topic which deals recovery and identification of plants remains from past geological time, This helps us to see the relationships between different organisms and also their mode of evolution. Past vegetation and past climate, environment can also be reconstructed by studying this subject.

Practical –Palaeobotany and Palynology (BOT-A-CC-3-5-P) Credit 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Before Outcome
Palaeobotany and Palynology	4	The purpose of this head is to stimulate the interest of students in palaeobotany. However references to review articles and reference books are prescribed so that they can get clear idea of this topic.	Simple and compound microscope	This is the topic which deals recovery and identification of plants remains from past geological time. This helps us to see the relationships between different organisms and also their mode of evolution. Past vegetation and past climate, environment can also be reconstructed by studying this subject.

Core course -6 Reproductive biology of Angiosperms (BO/T-A-CC-3-6-TH) Theoretical Credit 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Morphology of Angiosperms	30	The lectures are delivered in such a way that the students get knowledge of different terminology, floral structure etc	Interactive ; Audiovisual, Chart, model, Power point presentation, Overhead projector	They become interested in morphological aspect of Botany because it is the foundation of Botany
Embryology	30	The objectives of this topic is, to give idea about basic developmental biology in simplest way.	Interactive ; Audiovisual, Chart, model, Power point presentation, Overhead projector do	The students can get idea about pollen, ovule , embryo, etc

Practical – Reproductive biology of angiosperm (BOT-A-CC-3-6-P) Credits 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Reproductive biology of angiosperm	15	It is the supplement of the theoretical class. So that they can overcome all the theoretical problem and will be interested of the topic	Simple and compound microscope.	They can be able to perform different biochemical tests, physiological experiments, to see different cellular structure, and different histochemical test and chemical test.

Core course -7 Plant systematics (BOT-A-CC-3-7-TH) Credit 4

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Taxonomy of Angiosperms	32	Introducing the students not only to the traditional aspects of plant taxonomy but also to the modern techniques and recent trends that forms the basis of good taxonomic practice and interpreting evolutionary relationship.	Interactive ; Audiovisual, Chart, model, Power point presentation. Overhead projector	They know how the plants are arranged-classification, and also their mode of conservation and also plant biodiversity.

Practical – Plant Systematics (BOT-A-CC-3-7-P) Credits 2

Topic	No. of Classes required	Objectives of the topic	Strategy of teaching implemented	Outcome
Angiosperms	25	It is a supplement to the theoretical classroom. It helps the students to understand the subject more precisely.	Microscope – compound and simple	The students get clear idea about genus.

বিষয় (CC-1)	সাধারণউদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
একক - ১ (CC-1) **ভারতীয় সংবিধানের দায়িত্ব এবং কর্তব্য** - নাগরিকদের গণতান্ত্রিক এবং মৌলিক কর্তব্য । শিক্ষারধারণা, অর্থ, লক্ষণ, প্রকৃতি, পরিধি, ডেকারস কমিশন ।	নাগরিক হিসাবে তাদের কর্তব্য সম্পর্কে অবগত হবে । নাগরিক হিসাবে তাদের অধিকার সম্পর্কে ধারণা লাভ করবে । শিক্ষার অর্থ, প্রকৃতি, পরিধি সম্পর্কে অবগত হবে ডেকারস কমিশনের মতে আধুনিক শিক্ষার লক্ষ্য কি তা জানা সম্ভব হবে	৬ ৬	দলগত ও বিতর্কমূলক আলোচনা গতানুগতিক বক্তৃতা প্রশ্ন উত্তর	এটা একনায়কতন্ত্র নিবারণ করে বা সরকারের মধ্যস্থতা করে । মানুষের ব্যক্তিত্বের বিকাশ ঘটায় । সংখ্যা গরিষ্টদের কাছ থেকে সংখ্যা লঘুদের অধিকার দিয়ে তাদের রক্ষা করে । বিভিন্ন বয়স, জাতি, ধর্ম, বর্ণ নির্বিশেষে সকলকে ভালো শিক্ষা প্রদান করে । এই পদ্ধতির মাধ্যমে জ্ঞান, মূল্যবোধ, দক্ষতা, বিশ্বাস ও নৈতিক অভ্যাসের মান উন্নয়ন সম্ভব হয় ।
একক - ২ (CC-2) **ব্রিটিশ আমলে শিক্ষাব্যবস্থা (১৮০০ - ১৮৫৩) :** শ্রীরামপুর ত্রয়ী, এবং তাদের অবদান, প্রাচ্য-পাশ্চাত্য দ্বন্দ্ব, সেকালে মিনিট এডামের রিপোর্ট।	ব্রিটিশ আমলে ভারতীয় শিক্ষার বিকাশ সম্পর্কে জানা যাবে । শিক্ষাক্ষেত্রে শ্রীরামপুর ত্রয়ীর অবদান সম্পর্কে অবগত হবে । ব্রিটিশ আমলে শিক্ষা সম্পর্কে সচেতন হবে ।	৬	গতানুগতিক প্রশ্ন উত্তর দলগত আলোচনা	সনদ আইনের মাধ্যমে ভারতীয়দের শিক্ষার বিকাশ ঘটিয়াছে । প্রাচ্য শিক্ষার চেয়ে পাশ্চাত্য শিক্ষার ক্ষেত্রে বেশী অর্থ বরাদ্দের কথা বলা হয়েছে । ইংরেজী এবং ফার্সী ভাষাকে সরকারী ভাষা হিসাবে গণ্য করা হয়েছে ।

শিক্ষিকার স্বাক্ষর :

অধ্যক্ষা :

শিক্ষিকার নাম : গার্গী ভট্টাচার্য্য **(LEARNING MODULE)** লার্নিং মডিউল **বিভাগ : শিক্ষাবিজ্ঞান** **CC- 5, 6, 7** সেমিষ্টার - ৩

বিষয়	সাধারণ উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
একক - ১ (CC-5) সামাজিক শিক্ষাবিজ্ঞান সম্পর্কে ধারণা, অর্থ, সংজ্ঞা, সম্পর্ক, পরিধি ।	সমাজবিজ্ঞান ও শিক্ষাবিজ্ঞান সম্পর্কে ধারণা লাভ করবে । সামাজিক শিক্ষাবিজ্ঞানের প্রকৃতি পরিধি ব্যাখ্যা করা হবে । সামাজিক পরিবেশ সম্পর্কে জানা যাবে ।	৬	বক্তৃতা মূলক পারস্পরিক ক্রিয়া	সামাজিক শিক্ষাবিজ্ঞান প্রত্যেক ব্যক্তিকে সাহায্য করে কিভাবে মানুষ, সমাজ ও সামাজিক পদ্ধতি কাজ করে ত জানতে । সমাজ শিক্ষাবিজ্ঞান প্রত্যেক ব্যক্তি তথা সমাজের ধর্ম, সংস্কৃতি, ভাষা এবং শিক্ষাকে প্রভাবিত করে । আধুনিক শিক্ষামূলক সমাজ ব্যবস্থায় জনসংযোগমূলক শিক্ষা প্রতিষ্টান তথা উচ্চ শিক্ষা এবং অবিরাম শিক্ষা সম্বন্ধে সচেতন করে ।
একক -৩ (CC-6) শিক্ষামূলক পরিচালন অর্থ, উদ্দেশ্য , প্রকারভেদ ও গুরুত্ব ।	শিক্ষামূলক পরিচালনার কাজ সম্পর্কে জানা যাবে । শিক্ষামূলক পরিচালনায় ধারণা, প্রসার ভেদ সম্পর্কে শিক্ষার্থী বুঝতে সমর্থ হবে । এর উদ্দেশ্য এবং গুরুত্ব ব্যাখ্যা করা হবে ।	১০	বক্তৃতা , দলগত আলোচনা, প্রশ্ন উত্তর	শিক্ষামূলক পরিচালনা বিভিন্ন পরিচালনা মূলক বিজ্ঞান তত্ত্বকে সংযুক্ত করেছে যা শিক্ষামূলক পরিচালক এবং পরিচালনামূলক দলগত বিকাশে গুরুত্বপূর্ণ দায়িত্ব সম্পর্কে সংজ্ঞায়িত ও বিশ্লেষায়িত করেছে । শিক্ষামূলক পরিচালন সিদ্ধান্ত নিতে, সমস্যা সমাধান করতে, যোগাযোগ এবংপ রিচালনার তথ্যসমূহ জানতে সাহায্য করে । সহপাঠক্রমিক কার্যবলী পরিচালনা, সময়সূচী নির্ধারণ ইত্যাদিতে সাহায্য করে ।
একক -১ (CC-7) নির্দেশনার অর্থ, কাজ, প্রয়োজনীয়তা, ব্যক্তিগত নির্দেশনা, মাধ্যমিক বিদ্যালয়ের জন্য প্রয়োজনীয় নির্দেশনা ।	নির্দেশনার ধারণা সম্পর্কে অবগত হবে । নির্দেশনার সুবিধা অসুবিধা সম্পর্কে জানা যাবে । আদর্শ বিদ্যালয় নির্দেশনার ব্যবস্থা এবং প্রয়োজনীয়তা সম্পর্কে জানা যাবে ।	৮	বক্তৃতা পদ্ধতি বর্ণনামূলক	আদর্শ পরিচালনা সমবেত করে কিন্তু তরুণমনদের প্রয়োজন নির্দেশনা বা তার ব্যক্তিত্বকে পালিশ করে । শিক্ষার্থীরা বিদ্যালয় জীবনের বিভিন্ন পরিস্থিতিকে কি ভাবে তত্ত্বাবধান করতে সে সম্পর্কে পরামর্শ দেওয়া । নির্দেশনা শিক্ষার্থীদের আচরণ গঠন করে, শৃঙ্খলিত করে, সঠিক নির্দেশনা শিক্ষার্থীদের লক্ষ্য পূরণে সাহায্য করে ।

শিক্ষিকার স্বাক্ষর :

অধ্যক্ষা :

Name of the Teacher : Gargi Bhattacharjee **Dept. of Education** **LEARNING MODULE** CC-1 **Sem.-I** Education (Hons.)

Unit	Topic	Objectives	Classes required	Strategy and Methodology	Outcome
1	**(CC-1)** **Concept of Education –** Meaning, aims, nature & scope Delor's Commission	To understand the meaning nature, scope and aims of Education. To know about the aims of modern education with special reference to Delor's Commission.	6	1) Traditional lecture. 2) Question – Answer.	It facilitate quality learning all through the life among people of any age, group, caste, religion and region. It is the process of achieving knowledge values, skills, beliefs and moral habits.
2	**(CC-2)** **Education in India during the British period (1800 -1853) –** Sreerampore Trio & their contribution, Charter Act, Orientation – Occidental controversy, Macaulay Minute, Adams report.	To be acquainted with the development of education in British India. To know the contribution of Sreermpore Trio in the field of education. To become aware the British period.	6	1) Traditional lecture. 2) Question – Answer.	Charter act was first instance that British East India Company acknowledged of education in India. English education gets more fund as compare to oriental learning English become court language and Persian was abolished as court language.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher : Gargi Bhattacharjee **Dept. of Education** **LEARNING MODULE** CC-5 Sem.-III Education (Hons.)

Unit	Topic	Objectives	Classes required	Strategy and Methodology	Outcome
1	**(CC-5)** **Introductory concept of Sociology of Education** - Meaning, Definition, Relation, Nature of Scope of Sociology of Education.	To understand the relation between sociology and education. To Explain the concept of nature and scope of Sociology in Education. To know about Social Environment.	6	Lecture, Discussion, Interactive Method	Sociology of education helps the individual to understand human society and how social system work. Sociology focuses on the impact of religion, culture, race, Language and education on the individuals well as the society. It is mostly concerned with the public schooling system of modern Indus- trial societies including the expansion of higher, adult and continuing education.
3	**(CC-6)** **Educational Management** - Meaning of education management objectives of educational management, Types of Educational management, significance of Educational management.	To know the essential functions of educational management. To enable the students to understand the concept and types of educational management. To explain its objectives and Significance.	10	Lecture, Group discussion, Question – Answer.	It includes the study of various theories of management science which define and describes the roles and responsibilities of the educational manager and develop management skills. Helps in discussion and problem-solving, communication and managing information and building effective terms. Helps in planning of Co-Curricular activities, academic and preparation of time – table.

Signature of the Teacher :

PRINCIPAL

Name of the Teacher : Gargi Bhattacharya **Dept. of Education** **LEARNING MODULE** **CC-7** Sem.-III Education (Hons.)

Unit	Topic	Objectives	Classes required	Strategy and Methodology	Outcome
1	**(CC- 7)** **Guidance –** Meaning, functions need – Individual Guidance, Group Guidance, Need for guidance in Secondary School.	To know the concept of guidance. To understand the advantage and disadvantage of guidance. To be acquainted with need and requisite of a good school guidance programme	8	Interactive Lecture Question-answer	Good conduct is converted but young minds need guidance to polish their personality. The students are advised on how to cap with different situations they tend to face in their school life. It shapes students behaviour and also enough discipline in them. Proper guidance helps them to achieve their goals.

Signature of the Teacher :

PRINCIPAL

শিক্ষিকার নাম : গার্গী ভট্টাচার্য্য **(LEARNING MODULE)** লার্নিং মডিউল **বিভাগ :শিক্ষাবিজ্ঞান** CC-1 & 2 সেমিষ্টার - ১

বিষয় (CC-1)	সাধারণউদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
একক - ১ (CC-1) **ভারতীয় সংবিধানের দায়িত্ব এবং কর্তব্য** - নাগরিকদের গণতান্ত্রিক এবং মৌলিক কর্তব্য । শিক্ষারধারণা, অর্থ, লক্ষণ, প্রকৃতি, পরিধি, ডেকারস কমিশন ।	নাগরিক হিসাবে তাদের কর্তব্য সম্পর্কে অবগত হবে । নাগরিক হিসাবে তাদের অধিকার সম্পর্কে ধারণা লাভ করবে । শিক্ষার অর্থ, প্রকৃতি, পরিধি, সম্পর্কে অবগত হবে । ডেকারস কমিশনের মতে আধুনিক শিক্ষার লক্ষ্য কি তা জানা সম্ভব হবে ।	৬ ৬	দলগত ও বিতর্কমূলক আলোচনা গতানুগতিক বক্তৃতা প্রশ্ন উত্তর	এটা একনায়কতন্ত্র নিবারণ করে বা সরকারের মধ্যস্থতা করে । মানুষের ব্যক্তিত্বের বিকাশ ঘটায় । সংখ্যা গরিষ্টদের কাছ থেকে সংখ্যা লঘুদের অধিকার দিয়ে তাদের রক্ষা করে । বিভিন্ন বয়স, জাতি, ধর্ম, বর্ণ নির্বিশেষে সকলকে ভালো শিক্ষা প্রদান করে । এই পদ্ধতির মাধ্যমে জ্ঞান, মূল্যবোধ, দক্ষতা, বিশ্বাস ও নৈতিক অভ্যাসের মান উন্নয়ন সম্ভব হয় ।
একক - ২ (CC-2) **ব্রিটিশ আমলে শিক্ষাব্যবস্থা (১৮০০ - ১৮৫৩) :** শ্রীরামপুর ত্রয়ী, এবং তাদের অবদান, প্রাচ্য-পাশ্চাত্য দ্বন্দ্ব, সেকালে মিনিট এডামের রিপোর্ট।	ব্রিটিশ আমলে ভারতীয় শিক্ষার বিকাশ সম্পর্কে জানা যাবে । শিক্ষাক্ষেত্রে শ্রীরামপুর ত্রয়ীর অবদান সম্পর্কে অবগত হবে । ব্রিটিশ আমলে শিক্ষা সম্পর্কে সচেতন হবে ।	৬	গতানুগতিক প্রশ্ন উত্তর দলগত আলোচনা	সনদ আইনের মাধ্যমে ভারতীয়দের শিক্ষার বিকাশ ঘটিয়াছে । প্রাচ্য শিক্ষার চেয়ে পাশ্চাত্য শিক্ষার ক্ষেত্রে বেশী অর্থ বরাদ্দের কথা বলা হয়েছে । ইংরেজী এবং ফার্সী ভাষাকে সরকারী ভাষা হিসাবে গণ্য করা হয়েছে ।

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

শিক্ষিকার নাম : শ্রী ভট্টাচার্য্য **(LEARNING MODULE)** লার্নিং মডিউল **বিভাগ : শিক্ষাবিজ্ঞান** **CC- 5, 6, 7** সেমিষ্টার - ৩

বিষয়	সাধারণ উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
একক - ১ (CC-5) সামাজিক শিক্ষাবিজ্ঞান সম্পর্কে ধারণা, অর্থ, সংজ্ঞা, সম্পর্ক, পরিধি ।	সমাজবিজ্ঞান ও শিক্ষাবিজ্ঞান সম্পর্কে ধারণা লাভ করবে । সামাজিক শিক্ষাবিজ্ঞানের প্রকৃতি পরিধি ব্যাখ্যা করা হবে । সামাজিক পরিবেশ সম্পর্কে জানা যাবে ।	৬	বক্তৃতা মূলক পারস্পরিক ক্রিয়া	সামাজিক শিক্ষাবিজ্ঞান প্রত্যেক ব্যক্তিকে সাহায্য করে কিভাবে মানুষ, সমাজ ও সামাজিক পদ্ধতি কাজ করে তা জানতে । সমাজ শিক্ষাবিজ্ঞান প্রত্যেক ব্যক্তি তথা সমাজের ধর্ম, সংস্কৃতি, ভাষা এবং শিক্ষাকে প্রভাবিত করে । আধুনিক শিক্ষামূলক সমাজ ব্যবস্থায় জনসংযোগমূলক শিক্ষা প্রতিষ্টান তথা উচ্চ শিক্ষা এবং অবিরাম শিক্ষা সম্বন্ধে সচেতন করে ।
একক -৩ (CC-6) শিক্ষামূলক পরিচালন অর্থ, উদ্দেশ্য , প্রকারভেদ ও গুরুত্ব ।	শিক্ষামূলক পরিচালনার কাজ সম্পর্কে জানা যাবে । শিক্ষামূলক পরিচালনায় ধারণা, প্রসার ভেদ সম্পর্কে শিক্ষার্থী বুঝতে সমর্থ হবে । এর উদ্দেশ্য এবং গুরুত্ব ব্যাখ্যা করা হবে ।	১০	বক্তৃতা , দলগত আলোচনা, প্রশ্ন উত্তর	শিক্ষামূলক পরিচালনা বিভিন্ন পরিচালনা মূলক বিজ্ঞান তত্ত্বকে সংযুক্ত করেছে যা শিক্ষামূলক পরিচালক এবং পরিচালনামূলক দলগত বিকাশে গুরুত্বপূর্ণ দায়িত্ব সম্পর্কে সংজ্ঞায়িত ও বিশ্লেষায়িত করেছে । শিক্ষামূলক পরিচালন সিদ্ধান্ত নিতে, সমস্যা সমাধান করতে, যোগাযোগ এবংপ রিচালনার তথ্যসমূহ জানতে সাহায্য করে । সহপাঠক্রমিক কার্যবলী পরিচালনা, সময়সূচী নির্ধারণ ইত্যাদিতে সাহায্য করে ।
একক -১ (CC-7) নির্দেশনার অর্থ, কাজ, প্রয়োজনীয়তা, ব্যক্তিগত নির্দেশনা, মাধ্যমিক বিদ্যালয়ের জন্য প্রয়োজনীয় নির্দেশনা ।	নির্দেশনার ধারণা সম্পর্কে অবগত হবে । নির্দেশনার সুবিধা অসুবিধা সম্পর্কে জানা যাবে । আদর্শ বিদ্যালয় নির্দেশনার ব্যবস্থা এবং প্রয়োজনীয়তা সম্পর্কে জানা যাবে ।	৮	বক্তৃতা পদ্ধতি বর্ণনামূলক	আদর্শ পরিচালনা সমবেত করে কিন্তু তরুণমনদের প্রয়োজন নির্দেশনা বা তার ব্যক্তিত্বকে পালিশ করে । শিক্ষার্থীরা বিদ্যালয় জীবনের বিভিন্ন পরিস্থিতিকে কি ভাবে তত্ত্বাবধান করতে সে সম্পর্কে পরামর্শ দেওয়া । নির্দেশনা শিক্ষার্থীদের আচরণ গঠন করে, শৃঙ্খলিত করে. সঠিক নির্দেশনা শিক্ষার্থীদের লক্ষ্য পূরণে সাহায্য করে

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

VIJAYGARH JYOTISH ROY COLLEGE

GENERAL ELECTIVE COURSE IN CHEMISTRY
COURSE STRUCTURE – B.SC. GENERAL(SEM 3)

NAME OF FACULTY : DR SUMITA ROY

NAME OF THE TOPIC	NUMBER OF CLASSES REQUIRED	OBJECTIVE OF THE TOPIC	TEACHING METHODS FOLLOWED	OUTCOME
1) Aromatic Hydrocarbons	1) 5 lectures	1) i)Recognize and distinguish between aromatic and anti-aromatic compounds by their structures. ii)To know the properties of aromatic and anti-aromatic compounds, and the chemical consequences of aromaticity. iii) Recognize and be able to write the mechanism of Electrophilic aromatic substitution. iv) Be able to outline the completed Electrophilic Aromatic Substitution reactions of the following types: Halogenations, Nitration, Friedel Crafts reaction etc.	1)i) First of all a clear lesson plan is made. ii) In lecture method, mainly chalk and talk method is followed. iii) After completion of each chapter, a group discussion is made amongst students. iv) To give a clear idea of the 3D structure of molecules, **BALL & STICK** model is used. v) To get more up to date knowledge on the subject, we access Google.	1) Polycyclic Aromatic Hydrocarbons are ubiquitous air pollutants generated by combustion of Organic material, including fossil fuel. It has been an open question whether prenatal exposure to Air Pollution and PAH in particular significantly increases the risk of intra uterine grown restriction including small size for SGA and pre-term delivery.This was examined in cohort of mothers and newborns in New York city.

NAME OF THE TOPIC	NUMBER OF CLASSES REQUIRED	OBJECTIVE OF THE TOPIC	TEACHING METHODS FOLLOWED	OUTCOME
2) Organometallics (Grignard Reagent)	**2) 3 lectures**	2) Organometallic compounds are widely used both stoichiometrically in research and in industrial Chemical reactions as well as in the role of catalysts. To increase the rate of such reactions, where target molecules include polymers, pharmaceuticals and many other types of practical products.	2) Same as 1	2) Grignard reagents are strong Bases that will react with acidic hydrogens and they are excellent nucleophiles. They are often used to form alcohols by reaction with aldehyde and ketones. First the Grignard forms the c-c bond, this creates an alkoxide. Various important medicines, such as Tamoxifen is used for the treatment of breast cancer and cough-syrups use Grignard chemicals during their synthesis.
3) Aryl Halides	**3) 3 lectures**	3)The replacement of hydrogen atom in a hydrocarbon aliphatic or aromatic by halogen atoms results in the formation of alkyl halide and aryl halide repectively. Halo arenes contain halogen atoms attached to hybridized carbon atom of an aryl group. Many	3) Same as 1	3) These classes of compounds find wide applications in industry as well as in day to day life. Chlorine containing antibiotic Chloramphenicol produced by soil microorganisms is very effective for the treatment of typhoid fever.

NAME OF THE TOPIC	NUMBER OF CLASSES REQUIRED	OBJECTIVE OF TOPIC	TEACHING METHODS FOLLOWED	OUTCOME
		3)Halogen containing organic compounds occur in nature and some of them are clinical useful.		3) Synthetic halogen compounds e.g. Chloroquine is used for the treatment of malaria.

VIJAYGARH JYOTISH ROY COLLEGE
DEPARTMENT OF CHEMISTRY
COURSE NAME: CBCS SEM 1(HONS)

NAME OF FACULTY: Dr SUMITA ROY

NAME OF TOPIC	NUMBER OF CLASSES REQUIRED	OBJECTIVE OF THE TOPIC	TEACHING METHODS FOLLOWED	OUTCOME
1) **Stereochemistry** **i) Bonding geometries of carbon compounds and representation of molecules** **ii) Concept of chirality and symmetry** **iii) Relative and absolute configuration** **iv) Optical activity of chiral compounds**	**1) 17 lectures**	1)i) First of all we have to discuss the 3D structure of Organic molecules. ii) To recognize enantiomers , diastereomers and meso compounds iii) R/S designations of stereocentres are to be located. iv) Optical rotation, enantiomeric excesses are to be calculated v) Molecular models are to be used to determine the 3D arrangement of atoms in chiral molecules.	1)i) First of all a clear lesson plan is made. ii) In lecture method, mainly chalk and talk method is followed. iii) After completion of each chapter, a group discussion is made amongst students. iv) To give a clear idea of the 3D structure of molecules, **BALL & STICK** model is used. v) To get more up to date knowledge on the subject, we access Google.	1) An important branch of stereochemistry is the study of chiral molecules. Stereochemistry spans the entire spectrum of Organic, Inorganic, Biological, Physical and specially supra molecular Chemistry. Stereochemistry includes methods for determining and describing these relationships.
2) **General treatment of reaction mechanism** **Reactive intermediates: Carbcations,**	**2) 3 lectures**	2)i) We will be able to describe the Geometry of a given carbocation, carbanion,	2) Same as 1	2) The growing importance of cascade reactons reflects and imparts advances in the state of the

NAME OF TOPIC	NUMBER OF CLASSES REQUIRED	OBJECTIVE OF THE TOPIC	TEACHING METHODS FOLLOWED	OUTCOME
2) Carbanions, carbon radicals, carbenes.		2)i) Carbenes etc. ii) In a given series of carbocation, carbanion and carbenes, can be arranged in order of increasing or decreasing stability. iii) The relative stability of Primary, Secondary, Tertiary carbocations and carbanions can be explained in terms of hyperconjugation and inductive effects.		2) Organic synthesis underscores the desire of synthetic Chemists to achieve higher levels of elegance and efficiency. Besides their asthetic appeal, cascade processes offer economical and environmental friendly means for generating molecular complexity. Because of their many advantages, these reactions have found numerous applications in the synthesis of complex molecules, both natural and designed.

শিক্ষিকা : অনুরাধা গোস্বামী **(LEARNING MODULE)** লার্নিং মডিউল **বিভাগ :** বাংলা সেমিষ্টার - ১

বিষয় (CC-1)	সাধারণ উদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
ক) বাংলা সহিত্যের ইতিহাস : ১। অনুবাদ সাহিত্য :- ভাগবত, রামায়ণ, মহাভারত	অষ্টাদশ শতকের অনুবাদ সাহিত্যের সঙ্গে শিক্ষার্থীদের পরিচিতি ঘটানো ।	৪	প্রথাভিত্তিক বর্ণনামূলক পদ্ধতি ছাড়াও প্রশ্নোত্তর পদ্ধতি ও গল্পবলা পদ্ধতি এবং তুলনামূলক পদ্ধতি অনুসরণ করা হয় ।	পঞ্চদশ থেকে অষ্টাদশ শতাব্দীর বাংলার আর্থ সামাজিক ও রাজনৈতিক পটভূমি সম্পর্কে যেমন অবগত হবে শিক্ষার্থীরা তেমন ঐ সময়ের সাহিত্য সংস্কৃতির সঙ্গেও পরিচিত হবে ।
২। বৈষ্ণবপদাবলী - বিদ্যাপতি, চন্ডীদাস, কালিদাস, গোবিন্দদাস	বৈষ্ণব পদাবলী ও পদকর্তা সম্বন্ধে শিক্ষার্থীদের পরিচিতি ঘটানো বৈষ্ণব সহিত্যের নানাবিধ ধারা বিশেষ করে চরিত সাহিত্যের ধারার সহিত শিক্ষার্থীদের পরিচিতি ঘটানো	৬		
৩। চৈতন্যচরিত সাহিত্য - শ্রীচৈতন্য ভাগবত, শ্রীচৈতন্য চরিতামৃত	সান্মানিক পর্যায়ের শিক্ষার্থীদের ভাষাতত্ত্ব ও শব্দতত্ত্ব সম্পর্কে ধারণা প্রদান	৪		
খ) ভাষার ইতিহাস : (CC – 2) বাংলা ভাষার রূপ তাত্ত্বিক আলোচনা - বচন, লিঙ্গ, পুরুষ, সমাস, বিভক্তি, কারক, প্রত্যয়, ক্রিয়ার কাল, অব্যয়		১০		বাংলা ভাষার শব্দতত্ত্ব ও রূপতত্ত্ব সম্পর্কে ছাত্র-ছাত্রীরা জ্ঞান লাভ করবে ।

শিক্ষিকার স্বাক্ষর :

অধ্যক্ষা :

শিক্ষিকা : অনুরাধা গোস্বামী **(LEARNING MODULE)** লার্নিং মডিউল **বিভাগ :** বাংলা সেমিষ্টার - ৩

বিষয় (CC- 3 - 7)	সাধারণউদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
গ) ছোটগল্প : ১। রবীন্দ্রনাথ - নিশীথে, একরাত্রি, সুভা, অতিথি, ল্যাবরেটরী	রবীন্দ্রনাথের ছোটগল্প সম্পর্কে শিক্ষার্থীদের ধারণা দেওয়া ও বাঙালীর পারিবারিক জীবনযাত্রার সঙ্গে শিক্ষার্থীদের পরিচয় ঘটানো ।	১০	বর্ণনামূলক, প্রশ্নোত্তর ও তুলনামূলক পদ্ধতি	আধুনিক জীবনের জটিলতা, বাষ্টি-সমষ্টির দ্বন্দ্ব, পারিবারিক জীবনে নারী পুরুষের অবস্থান ও লড়াই ইত্যাদি নানা প্রবণতার সম্পর্কে যেমন জ্ঞানলাভ তেমনি পাশ্চাত্য সাহিত্যের সঙ্গে পরিচিতি লাভ ।
২। একালের ছোটগল্প সঞ্চয়ন :- পয়োমুখম, মহানগর, ফসিল, এখন প্রেম, প্লাবনকাল ।	বিংশ শতাব্দীর বাঙালীর পারিবারিক জীবনের জটিলতা ও তাদের ভাবনাচিন্তা সঙ্গে শিক্ষার্থীদের পরিচয় ঘটানো ।	১০	বর্ণনামূলক, প্রশ্নোত্তর ও তুলনামূলক পদ্ধতি	

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

বিষয় (CC- 3 - 5)	সাধারণউদ্দেশ্য	প্রয়োজনীয় ক্লাস সংখ্যা	পদ্ধতি	কাঙ্খিত ফল
ক) বাংলা সহিত্যের ইতিহাস: ১। কথাসাহিত্য : রবীন্দ্রনাথ, শরৎচন্দ্র, জগদীশ গুপ্ত, পরশুরাম, মানিক বন্দোপাধ্যায়, প্রেমেন্দ্র মিত্র, বিভূতিভূষণ বন্দোপাধ্যায়, তারাশঙ্কর বন্দোপাধ্যায়, সতীনাথ ভাদুড়ী, সুবোধ ঘোষ, সোমেন চন্দ, সমরেশ বসু, আশাপূর্ণা দেবী সৈয়দ ওয়ালি উল্লাহ **খ) ভাষার ইতিহাস :** **(CC-3 - 6)** ১। প্রাচীন বাংলা ভাষার ভাষা তাত্ত্বিক লক্ষণ -প্রেক্ষিত চর্যাপদ ২। আদি মধ্য বাংলা ভাষার ভাষা তাত্ত্বিক লক্ষণ -প্রেক্ষিত শ্রীকৃষ্ণ কীর্তন	বিংশ শতাব্দীর বাংলা কথা সাহিত্যের স্বরূপ ও গতি প্রকৃতি সম্পর্কে জ্ঞানার্জনে ছাত্র-ছাত্রীদের সাহায্য করা । প্রাচীন ও আদি মধ্য বাংলা ভাষার সাহিত্যিক নিদর্শন সম্পর্কে অবহিত করা ।	১৫ ৬	প্রথানুগত বর্ণনামূলক পদ্ধতি ছাড়াও প্রশ্নোত্তর পদ্ধতি, গল্পবলা পদ্ধতি এবং তুলনামূলক পদ্ধতি অনুসরণ করা হয় । প্রশ্নোত্তর পদ্ধতি ও তুলনামূলক পদ্ধতি	বিংশ শতকের রবীন্দ্রনাথ থেকে সৈয়দ ওয়ালি উল্লাহ পর্যন্ত বাংলা কথা-সাহিত্যের গতিপ্রকৃতি সম্পর্কে ছাত্র-ছাত্রীরা জ্ঞানলাভ করবে এবং পাশ্চাত্য কথা সাহিত্যের সঙ্গেও পরিচিত হবে । প্রাচীন ও আদি মধ্য বাংলা ভাষার ভাষাতাত্ত্বিক লক্ষণ, ভাষাগত বৈশিষ্ট্য ও তার বিবর্তন সম্পর্কে শিক্ষার্থীদের ধারণা লাভ অর্জন ।

শিক্ষিকার স্বাক্ষর : অধ্যক্ষা :

Learning Module

Department of Microbiology

Name of faculty: Dr. Sampa Debnath

Sl.N0	Level	Paper	Broad area	Description	Mode of teaching	Learning Outcome
1	Under Graduate. Hons:Semester: III	Microbial Metabolism	Unit 3 Chemoheter otrophic Metabolism -	Aerobic Respiration Concept of aerobic respiration, anaerobic respiration and fermentation Sugar degradation pathways i.e. EMP, ED, Pentose phosphate pathway TCA cycle Electron transport chain: components of respiratory chain, comparison of mitochondrial and bacterial ETC, electron transport hosphorylation. uncouplers and inhibitors	By Power Point presentation, and by application of ICT technique e.g. Google Class Room	Learner can gather the knowledge of biological activity of microorganism in presence of oxygen
			Unit 4 Chemoheter otrophic Metabolism -	Anaerobic respiration and fermentation Anaerobic respiration with special reference to dissimilatory nitrate reduction	By Power Point presentation, and by application of	From this unit learner can the knowledge of biological activity of microorganism in absence of oxy[illegible]

				(Denitrification; nitrate /nitrite and nitrate/ammonia respiration; fermentative nitrate reduction) Fermentation - Alcohol fermentation and Pasteur effect; Lactate fermentation (homo fermentative and hetero fermentative pathways), concept of linear and branched fermentation pathways	ICT technique e.g. Google Class Room	
2.	Under Graduate Part III Hons	Paper VII (100 marks) Practical	Enzyme Kinetics	Unit I 1. Isolation and characterization of one industrially important enzyme, immobilization of cells. 2. Determination of Km, Vmax and pH optima, effect of activator, inhibitor of alkaline phosphatase Unit II 1. Protein estimation by Lowry method 2. Absorption spectra of DNA and protein, hyperchromic shift of DNA 3. Phage titration	Hands On Practical	Learner can grow experience of hands on practical which they have learnt in theory classes. Besides these they also can grow some special qualities e.g cooperation and working together.
3	M.Sc Semester I	Micro C15:	Microbial Metabolism	Bacterial photosynthesis (different types of photosynthetic bacteria, photopigments, paths of carbon and electron in bacterial photosynthesis); metabolism of energy reserve	By Power Point presentation, and by application of ICT technique e.g.	Learner can grow the knowledge how microorganism can exist in different environment and this knowledge will help them to protect from

				compounds (polyglycans, -hydroxybutyrate); metabolic energetics: basic differences in anaerobic and respiratoryβpoly- and kinds of energy metabolism; energy conservation in chemolithotrophic bacteria (Nitrobacter, Nitrosomonas, Thiobacilli including Thiobacillus ferrooxidans, methanogens, hydrogen oxidizing bacteria);	Google Class Room	pathogenic organism
4	M.Sc Semester I	Micro S11:	Enzymes and Reaction Kinetics	Practical: Estimation of proteins, enzyme kinetics, effects of pH and temperature on enzyme, use of inhibitors for active site determination, chromatographic techniques, purification of enzymes. chemical estimation of vitamins, minerals like calcium, iron etc, separation of biomolecules by electrophoresis, determination of molecular weight by gel filtration.	Hands on practical	Learner can grow the knowledge of 1. Estimation of protein, 2. Enzyme kinetics 3. Effect of inhibitor on microbial enzyme 4. Different techniques of determination of molecular weight enzyme 5. Besides these they also can grow some

						special qualities e.g cooperation and working together

Department: Microbiology

Name of faculty: Dr. Gargi Saha Kesh

Paper Taken	Description	Broad area	Mode of teaching	Outcome
UG Semester III: CC-7-P	1. Study of different types of DNA and RNA using micrographs and model / schematic representations 2. Study of semi-conservative replication of DNA through micrographs / schematic representations 3. Isolation of genomic DNA from *E. coli* 4. Estimation of salmon sperm / calf thymus DNA using colorimeter (diphenylamine reagent) or UV spectrophotometer (A260 measurement) 5. Estimation of RNA using colorimeter (orcinol reagent) or UV spectrophotometer (A260 measurement) 6. Resolution and visualization of DNA by Agarose Gel Electrophoresis. 7. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).	Molecular Biology Practical	Hands on and demonstration practical	1. Get idea about the structure of DNA and RNA. 2. Get idea about how semiconservative mode of replication takes place. 3. Hands on experience on genomic DNA isolation. 4. Hands on experience on different methods of DNA estimation. 5. Hands on experience on different methods of RNA estimation. 6. Hands on experience on DNA agarose gel electrophoresis 7. Detailed idea about proteins Polyacrylamide Gel Electrophoresis (SDS-PAGE).
UG Part III: Paper V A	Genetic exchange and recombination: Transformation, Conjugation, Hfr bacteria	Microbial Genetics	OHP, Chalk and talk	1. Detailed idea about Trnasformation, conjugation and

	and chromosome mapping, Transduction- generalised (P1) and specialized (lambda- phage). Homologous recombination (Holiday straucture: Rec BCD system; gene conversion, site specific recombination (lambda). Transposable elements: Bacterial Transposons			transduction. 2. Knowledg e on homologous recombination, gene conversion, site specific recombination. 3. Detailed knowledge on transposons, specially bacterial transposons.
UG Part III: Paper VB	Isolation & purification of nucleic acids & protein, Finger printing, Southern blotting, Dot blotting, Northern blotting, Western blotting- techniques. Cloning vectors (pBR322, pUC 18, 19, YACs). Cloning, PCR techniques, Construction of DNA libraries (basic ideas and outlines of methods). Overexpression of recombinant proteins in bacteria: insulin, human growth hormone, FSH.	Industrial Microbiology & Recombinant DNA Technology	ICT, chalk and talk	1. Detailed knowledge on how to isolate nucleic acids and protein. 2. Idea on blotting techniques like dot blot, Southern etc. 3. Detailed knowledge on vectors, cloning techniques. 4. Theoretica l knowledge on DNA library construction 5. Detailed knowledge on overexpression of recombinant proteins like FSH etc.
UG Part III: Paper VIII	Isolation of plasmid DNA, Restriction digestion of DNA, Transformation of bacteria, Conjugation, Blood grouping, Immunoelectrophoresis, ODD, SRID	Recombinant DNA Technology and Immunology Practical	Hands on practical	Hands on experience on plasmid DNA isolation, restriction digestion, transformation, conjugation, blood grouping, immunoelectroph oresis, ODD and SRID.

PG Semester I: C 14	General laboratory practices and handling of instruments; training on centrifugation, microscopy and spectroscopy.	Biophysical Methods & Instrumentation Practical	Hands on and demonstration practical	1. Detailed knowledge of general laboratory practices and instrument handling. 2. Hands on training on centrifugation, microscopy and spectroscopy.

Department of Economics

Academic Plan-Even Semester-2021-22

Economics Core Course III: ECO-A-CC-2-3-TH-TU

Introductory Macroeconomics

Total Marks: 100 [Theory (Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 , No. of Lecture hours: 75, No. of Tutorial contact hours: 15 [For Semester-II]

UNIT	TOPIC	LECTURES	RESPONSIBILITY
I	**1. National Income Accounting** 1.1 Macroeconomic data- Basic concepts of National Income accounting. 1.2 The circular flow. Concepts of GNP, GDP, NNP, and NDP at market price and at factor cost 1.3 The measurement of National Income-Value Added Method and Expenditure Method. 1.4 The problem of double counting 1.5 The role of Government 1.6 Concepts of Corporate Income, Corporate Savings, Personal Income, Personal Disposable Income and Personal Savings. Saving-Investment gap and its relation with budget deficit and trade surplus 1.7 National Income accounting and cost of living 1.8 Basic idea of India's national income.	20	IM
II	**2. Income Determination in the Short Run (Part-I) : The Simple Keynesian Model in a Closed Economy** 2.1 The Simple Keynesian Model (SKM) in a Closed Economy without Government- the Keynesian Consumption Function. 2.2 The Keynesian Saving Function 2.3 Income determination in SKM 2.4 Stability of equilibrium 2.5 The concept of effective demand- the concept of demand-determined output 2.6 The Simple Keynesian Multiplier 2.7 The paradox of thrift 2.8 The SKM in a Closed Economy with Government 2.9 Government expenditure and tax 2.10 The government expenditure multiplier and the tax rate multiplier 2.11 The balanced budget multiplier 2.12 The budget surplus 2.13 Effects of tax changes and government purchases on budget surplus 2.14 The full employment budget surplus	18	IM
III	**3. The Classical system** 3.1 Basic ideas of Classical Macroeconomics; 3.2 Say's Law and Quantity Theory of Money, Loanable fund theory 3.3 The Classical Theory of Income and Employment determination 3.4 Full Employment and wage-price flexibility 3.5 Classical Dichotomy and Neutrality of Money.	18	PPH
IV	**4. Classical Dichotomy and Neutrality of Money.** 4.1 The bond market as the mirror image of the money market-	19	PPH

	the Walras' Law. Relationship between bond price and rate of interest- the concept of Keynesian liquidity preference schedule- speculative demand for money and liquidity trap. 4.2 Investment function: Concepts of Marginal productivity of capital, marginal efficiency of capital (MEC) and marginal efficiency of investment (MEI)- Jorgenson's neo-classical theory- Acceleration principle- fixed and variable. Multiplier-accelerator interaction.		

Textbooks:

1. Dornbusch, Fischer and Startz, Macroeconomics, McGraw Hill, 11th edition, 2010.

2. N. Gregory Mankiw. Principles of Macroeconomics, Indian Imprint of South Western by Cengage India, 6th edition, 2015.

3. N. Gregory Mankiw. Macroeconomics, Worth Publishers, 2010.

4. Ghosh Chandana and Ghosh Ambar, Macroeconomics, PHI Learning Pvt Ltd, 2014.

References

1. Richard T. Froyen, Macroeconomics, Pearson Education Asia, 2nd edition, 2005.

2. Andrew B. Abel and Ben S. Bernanke, Macroeconomics, Pearson Education, Inc., 7th edition, 2011.

3. Venieris, Y.P. and Sebold F.D., Macroeconomics: Models and Policy, John Wiley and Sons, 1977.

4. Ackley Gardner (old), Macroeconomic Theory, Macmillan, 1961

5. Ackley Gardner(new), Macroeconomics : Theory and Policy : Macmillan,1978

6. Ghosh Chandana and Ghosh Ambar, Indian Economy : A Macro-theoretic Analysis, PHI Learning Pvt Ltd, 2016.

7. J.R.Hicks. The Social Framework: An Introduction to Economics, Clarendon Press, 3rd edition, 1960.

8. Sikdar Soumyen, Principles of Macroeconomics, Oxford University Press.

9. Economic Survey , Government of India, various issues.

Economics Core Course IV: ECO-A-CC-2-4-TH-TU

Mathematical Methods in Economics-II

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10] Total Credits: [5(Th)+1(Tu)]=6 , No. of Lecture hours: 75, No. of Tutorial contact hours:15

[For Semester-II]

UNIT	TOPIC	LECTURES	RESPONSIBILITY
I	**1.Function of several variables** 1.1 Continuous and differentiable functions: partial derivatives and Hessian matrix. Homogeneous and homothetic functions 1.2 Euler's theorem, implicit function theorem (without proof) and its application to comparative statics problems. 1.3 Economic applications- the idea of level curves, theories of consumer behaviour and theory of production	14	AD
II	**2. Multi-variable optimization** 2.1 Optimization of nonlinear functions: Convex, concave, and quasi-concave functions; Unconstrained optimization 2.2 Constrained optimization with equality constraints- Lagrangian multiplier method; role of Hessian determinant. 2.3 Inequality constraints and Kuhn-Tucker Conditions 2.4 Value function and Envelope theorem; Economic applications – consumer behaviour and theory of production. 2.5 Optimization of linear function: Linear programming; concept of slack and surplus variables (graphical solution only). Concept of convex set. The Duality Theorem 2.6 Economic Applications of Linear programming	35	AD
III	**3. Difference Equations** 3.1 Finite difference; Equations of first and 2nd orders and their solutions 3.2 Application in Economics- Cobweb model, Multiplier-Accelerator model.	12	IM
IV	**4. Differential Equations** 4.1 Solution of Differential equations of first	14	IM

	order and second order of linear differential equations 4.2 Solution of Differential equations of first order and second order of linear differential equations 4.3 Qualitative graphic solution to 2x2 linear simultaneous non-linear differential equation system- phase diagram, fixed point and stability. Economic applications in microeconomics and macroeconomics		

Text:

• Alpha C. Chiang and Kavin Wainwright: Fundamental Methods of Mathematical Economics, Mc Graw Hill, 2005.

References:

1. K. Sydsaeter and P. Hammond, Mathematics for Economic Analysis, Pearson Educational Asia: Delhi, 2002.

2. Carl Simon and Lawrence Blume. Mathematics for Economists, W. W. Norton and Company, 1994

3. A. Mukherji and S. Guha: Mathematical Methods and Economic Theory, Oxford University Press, 2011.

4. Hands, D. W.: Introductory Mathematical Economics, Second Edition,2004.

5. Silberberg, E. and Suen, W.: The Structure of Economics : A Mathematical Analysis, Third edition, Mc-Graw Hill, 2001.

6. K. G. Binmore, Mathematical analysis, Cambridge University Press, 1991.

7. Archibald, G.C. and Lipsey, R.G. , An Introduction to Mathematical Treatment of Economics, 1967, Weidenfeld and Nicolson

8. Henderson, J.M. and Quandt, R.E., Microeconomic Theory : A Mathematical Approach, McGrawHill,1980.

9. Intrilligator, M.D., Mathematical Optimization and Economic Theory, Society for Industrial and Applied Mathematics, Philadelphia, 1971.

10. Allen, R.G.D., Mathematical Analysis for Economists, McMillan, London, 1967 Page 16 of 75

11. Dorfman, R., Samuelson, P.A. and Solow, R.M. , Linear Programming and Economic Analysis, McGraw-Hill, 1958.

12. Dixit, A.K., Optimization in Economic Theory, Oxford University Press, 1976

Economics Core Course VIII: ECO-A-CC-4-8-TH-TU

Intermediate Microeconomics II

Total Marks: 100 [Theory (Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 , No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester IV]

Unit	Topic	Lecture	Responsibility
Unit 1	**1 Imperfect Market Structure** 1.1Monopoly and barriers to entry- output determination and price rule, measure and sources of monopoly power, social costs of monopoly power-deadweight loss 1.2Pricing with market power- first, second and third degree price discrimination, multiplant monopoly 1.3 Monopolistic competition- short run and long run equilibrium, excess capacity 1.4 Oligopoly- Oligopoly equilibrium as Nash equilibrium, Cournot, Bertrand and Stackelberg Model- use of isoprofit curves and simple game theoretic interpretation. Sweezy's kinked demand Page 25 of 75 curve model and non-collusive equilibrium. Competition versus collusion- the Prisoners' Dilemma. Collusive Oligopoly –Cartels and Price Leadership	**40**	**PPH**
Unit 2	**2 Input market under Imperfect Competition** 2.1 Monopsony, bilateral monopoly in labour market	**5**	**PPH**
Unit 3	**3 General Equilibrium, Efficiency and Welfare** 3.1 Exchange, production and welfare, Pareto Optimality, Edgeworth box and contract curve, Pareto efficiency and perfect competition 3.2 Reasons for Market failure, Pareto efficiency and market failure (externalities and public goods), property right and Coase Theorem 3.3 Markets with asymmetric information-adverse selection, moral hazards, agency problems (concepts only	**30**	**AD**

Text

• Pindyck, Rubinfeld and Mehta, Microeconomics, Pearson

References

1. Hal. R Varian , Microeconomic Analysis, WW Norton and Company, 3rd edition, 2013

2. J Tirole, Theory of Industrial Organisation, MIT Press, 1988

3. K Binmore, Fun and Games: A text on Game Theory, OUP,1991

4. Anindya Sen, Microeconomics, OUP

5. C. Snyder and W. Nicholson, Fundamentals of Microeconomics, Cengage Learning, 2010

6. Satya Chakrabarty, Microeconomics, Allied Publishers

7. Ferguson, C. E. and Gould, J.P., Microeconomic Theory, Aitbs Publishers and Distributors, New Delhi.

8. Cohen, K.J. and Cyert, R.M. , ―Theory of the Firms: Resource Allocation in a Market Economy‖ , Prentice Hall India,1981 9. Chauhan, S.P.S. , ― Microeconomics- An Advanced Treatise‖, Prentice Hall India, 2009.

Economics Core Course IX: ECO-A-CC-4-9-TH-TU

Intermediate Macroeconomics II

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 ,

No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester IV]

UNIT	TOPIC	LECTURES	RESPONSIBILITY
I	1. Basic Tenets of New Classical and New Keynesian Theories **1.1** New Classical Theory-The concept of rational expectations and the theory of real business cycleintroductory ideas 1.2 New Keynesian Theory- nominal rigidities and real rigidities, rigidities in interest rates and credit rationing-introductory ideas	**20**	**PPH**
II	**2.** Macroeconomic Foundations –II 2.1 Consumption: Keynesian consumption function; Fisher's theory of optimal intertemporal choice; life-cycle and permanent income hypotheses; Dusenberry's relative income hypothesis; rational expectations and random-walk of consumption expenditure. **2.2** Demand for money: Regressive Expectations and Tobin's portfolio choice models; Baumol's inventory theoretic money demand. **2.3**	**20**	**PPH**
III	3. . Economic Growth 3.1 Harrod and Domar models of economic growth. 3.2 Solow one sector growth model-golden rule- -dynamic efficiency. 3.3 Technological progress 3.4 Elements of endogenous growth theory-basic ideas-the AK model	**35**	**IM**

Textbooks:

- N. Gregory Mankiw. Macroeconomics, Worth Publishers, 2010
- Ghosh Chandana and Ghosh Ambar, Macroeconomics, PHI Learning Pvt Ltd, 2014 References
- Richard T. Froyen, Macroeconomics, Pearson Education Asia, 2nd edition, 2005.
- Romer David , Advanced Macroeconomics, McGraw Hill Education, 4th edition, 2011.

• Ghosh Chandana and Ghosh Ambar, Economics of the Public Sector, PHI Learning Pvt Ltd, 2008

• Andrew B. Abel and Ben S. Bernanke, Macroeconomics, Pearson Education, Inc., 7th edition, 2011.

• Richard T. Froyen, Macroeconomics, Pearson Education Asia, 10th edition, 2016.

• Steven M. Sheffrin, Rational Expectations, Cambridge University Press, 2nd edition, 1996.

• William Branson. Macroeconomics , Harper and Row, 3rd edition, 1989

• Snowdon and Vane (ed), A Macroeconomics Reader, Routledge, Taylor and Francis Group.

• R. Barro. Macroeconomics, 5th edition, The MIT Press, 1989

• A.K.Sen (ed). Growth Economics, Penguin, 1970

• Barro, R.J. and Xavier Sala-i-Martin , Economic Growth,

• Errol D'Souza. Macroeconomics, Pearson Education (New Delhi), 2009.

• Dornbusch, Fischer and Startz, Macroeconomics, McGraw Hill, 11th edition, 2010.

• Laidler, E.W. ,The Demand for Money : Theories and Evidence, Dun-Donnelley Publishing Corporation, New York, 1978.

Economics Core Course X: ECO-A-CC-4-10-TH-TU

Introductory Econometrics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 , No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[For Semester IV]]

UNIT	TOPIC	Lectures	Responsibility
1	1. Nature and Scope of Econometrics 1.1 Distinction between Economic Model and Econometric model **1.2** Concept of stochastic relation, Role of random disturbance in econometric model **1.3** Types of data **1.4** Application of Econometrics in different branches of social science	**4**	
2	**2** Classical Linear Regression Model (Simple linear regression and multiple linear regression): part 1 2.1 The classical assumptions (basic interpretation) 2.2 Concepts of population regression function and sample regression function 2.3 Estimation of model by method of ordinary least squares (Derivation in simple linear model (SLRM) and multiple linear model (MLRM) with two regressors only) 2.4 Simple correlation, partial correlation and multiple correlation (Definition, and interpretation in the context of SLRM and MLRM) 2.5 Limitations of SLRM and additional complications in MLRM 2.6 Economic interpretations of the estimated model	**15**	
3	3.Classical Linear Regression Model (Simple linear regression and multiple linear regression): part 2 3.1Properties of the Least Squares Estimators (BLUE) in SLRM- Gauss-Markov theorem 3.2Qualitative (dummy) independent variables – intercept dummy and slope dummy (only interpretation of the model) 3.3Forecasting – Ex-post forecast and Ex-ante forecast, forecast error	**10**	
4	4 Statistical inference in linear regression model **4.1** Use of standard normal, chi2, t, and F statistics in linear regression mode **4.2** Testing hypothesis Single test (t test and chi2 test) Joint test (F test)	**26**	

	4.3 Goodness of fit (in terms of R2 , adjusted R2 and F statistic), Analysis of Variance (ANOVA) **4.4** Statistical significance and economic importance		
5	5 Violations of Classical Assumptions **5.1** Multicollinearity - Consequences, Detection (Variance Inflationary Factor (VIF)) and Remedies **5.2** Heteroscedasticity - Consequences, Detection (Lagrange Multiplier test) and Remedies **5.3** Autocorrelation - Consequences, Detection (Durbin-Watsontest) and Remedies	**12**	
6	6. Specification Analysis 6.1 Omission of a relevant variable 6.3 Inclusion of irrelevant variable 6.3 Tests of specification errors 6.4 Testing for linearity and normality assumptions	**8**	

Text Books

1. Gujarati, Damodar (2004), Basic Econometrics, McGraw-Hill Page 29 of 75

2. Wooldridge, Jeffrey M. (2013), Introductory Econometrics – A Modern Approach, CENGAGE learning

Reference Books

1. Maddala, G. S. (2002), Introduction to Econometrics, Macmillan Publishing Company

2. Goon, A. M, Gupta, M. K, and Dasgupta, B., Fundamentals of Statistics (Volume One), The World Press Private Ltd

Skill Enhancement Course II: ECO-A-SEC-4-B(2)-TH

Research Methodology

Total Marks: 100 [Theory (Th) 80 + Internal Assessment 10+Attendance: 10]

Total Credits: =2, No. of Lecture hours: 30,

[For Semester IV]

Unit	Topic	Lectures	Responsibility
1	1 **Methodological Issues 1** **1.1**Locating the basic issues- theme based literature survey and motivation behind any studyobjectives of the study-development of writing skills **1.2** Designing the sampling frame in case of field survey- the role of pilot survey **1.3** The role of random numbers in drawing random sample **1.4** Methods behind preparation of questionnaire in case of field survey **1.5** Data entry after field survey **1.6** Tabular representation of data and graphs for data interpretation	10	
2	2 **Methodological Issues 2** **2.1**Theoretical and Empirical Research in Economics. **2.2** Common sections of an ideal research paper in Economics **2.3** Illustrations of empirical research work. Reporting the regression results and interpretation of the results: the role of statistical inference.[The course instructor should focus on framing the testable hypothesis and the role of statistical inference in empirical research] **2.4** Illustrations of theoretical research: specification of the model, closing the model, checking stability of the model for meaningful comparative static results. [The course instructor should focus on the role of stability analysis in theoretical models by showing the method of linearizing non-linear differential equations. Illustrations can be made from IS-LM model by using trace and determinant conditions of the Jacobian matrix-the role of phase diagrams] **2.5** Role of footnotes or end notes in a research paper **2.6** Bibliography, reference and citation **2.7** Writing the abstract of a research paper **2.8** Key words and JEL Classification	20	

	2.9 Presentation of a research paper through power point. Basic rules to be followed for a good presentation. Role of diagrams, graphs, pictures and charts.		

Suggested Readings

1. Goon, A. M, Gupta, M. K, and Dasgupta, B. Fundamentals of Statistics (Volumes One and Two),The World Press Private Ltd

2. C.R. Kothari : Research Methodology : Methods and Techniques (second revised edition), New Age India (P) Ltd Publishers.

3. Alpha C. Chiang and Kavin WainWright : Fundamental Methods of Mathematical Economics, McGraw Hill, 2005.[For stability analysis]

Economics Core Course XIII: ECO-A-CC-6-13-TH-TU

Public Economics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 , No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester VI]

Unit	Topic	Lectures	Responsibility
UNIT 1	1. Government in a Market Economy 1.1 Market failure and externalities; public and merit goods; 1.2 Government intervention; 1.3 Public Expenditure for financing development	**15**	
UNIT 2	2. Choice and Public Economics 2.1 Characteristics of Pure Public Good; Distinction between Pure Public Good and Private Good; 2.2 Market Failure in case of Pure Public Good Optimal provision of Public Goods - Private Provision and Public Provision of Public Goods, 2.3 Lindahl Equilibrium, Voting Equilibrium.	**20**	
UNIT 3	3 The Revenue and Expenditure of the Government 3.1 Classification of Taxes; Canons of Taxation; 3.2 Principles of Taxation - Benefit Principle, Equal Sacrifice Principle, Ability to Pay Principle; 3.3 Effects of taxation on income distribution, work efforts, and on savings, 3.4 The Laffer curve; 3.5 Comparison between direct and indirect taxes – income and substitution effects; 3.6 Optimal Taxation	**20**	
UNIT 4	4 Public Finance 4.1 Meaning and Classification of Public Expenditure - government budget and its types, government expenditure and tax multipliers, balanced budget multiplier; 4.2 Meaning of Public Debt; Sources of Public Borrowings: internal and external borrowing; Effects of Public Debt. 4.3 Indian Public Finance – Fiscal Federalism in India	**20**	

References:

• J. F. Due and A. F. Friedlander. Government Finance-Economics of Public Sector, AITBS Publishers and Distributors, 1994

• J. Hindriks and G. D. Myles. Intermediate Public Economics, The MIT Press; Annotated Edition, 2006.

• R.A. Musgrave and P.B. Musgrave, Public Finance in Theory & Practice, McGraw Hill Publications, 5th edition, 1989.

• Amaresh Bagchi (ed), Readings in Public Finance, OUP

• 5. J. E. Stiglitz. Economics of Public Sector,W. W Norton and Company, 3rd Edition, 2000.

• A Ghosh and C. Ghosh, Economics of the Public Sector, Prentice Hall India Learning Private Limited; 2nd Revised edition (2014)

Economics Core Course XIV: ECO-A-CC-6-14-TH-TU

Development Economics

Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10]

Total Credits: [5(Th)+1(Tu)]=6 , No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester VI]

Unit	Topic	Lectures	Responsibility
Unit 1	1. Meaning of Economic Development 1.1 Income Approach and Capability Approach, 1.2 Construction and interpretation of HDI; international variations in development measures; comparing development trajectories across nations and within them. 1.3 • Dependency school of development.	10	
Unit 2	**2** Poverty and Inequality 2.1 Inequality axioms; a comparison of commonly used inequality measures. 2.2 Gender Inequality, connections between inequality and development 2.3 Poverty measurement, HPI; poverty traps and path dependence of growth processes. 2.4 Vicious Circle of Poverty Hypothesis	**15**	
Unit 3	3. Dual Economy Models 3.1 The concept of surplus labour and disguised unemployment 3.2 Peasants and Dualism with and without surplus labour • Interdependence of agriculture and Industry (Lewis model, Ranis-Fei model) 3.3 Rural-Urban Migration (Harris- Todaro model)	**20**	
Unit 4	4 Population Growth and Economic Development 4.1 Basic concepts (Birth and Death Rates, mortality, fertility) 4.2 Demographic transition theory 4.3 Cost of children, externalities 4.4 Low Level Equilibrium Trap models and their criticism-critical minimum effort theory (Nelson and Leibenstein).	**10**	
Unit 5	5. Development Strategies 5.1Balanced vs. Unbalanced Growth Theories 5.2 Choice of Techniques	**10**	
Unit 6	6. Political Institutions and the State 6.1 Definition of institutions, Evolution of Political and Economic Institutions. 6.2 The determinants of democracy 6.3 Alternative institutional trajectories and their relationship with economic performance. 6.4 Within-country differences in the functioning of state	**10**	

	institutions. State ownership and regulation. Government failures and corruption.		

Texts 1.

Todaro and Smith: Economic Development, Pearson Education, 2009 2. Debraj Ray, Development Economics, Oxford University Press, 2009. 3. Kaushik Basu, Analytical Development Economics, OUP

References

• ParthaDasgupta, Economics, a Very Short Introduction, Oxford University Press, 2007.

• Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, Understanding Poverty, Oxford University Press, 2006.

• KaushikBasu, The Oxford Companion to Economics in India, OUP, 2007. • AmartyaSen, Development as Freedom, OUP, 2000.

• Daron Acemoglu and James Robinson, Economic Origins of Dictatorship and Democracy, Cambridge University Press, 2006.

• Robert Putnam, Making Democracy Work: Civic Traditions in Modern Italy, Princeton University Press, 1994

• Meier and Rauch (ed)- Leading Issues in Development Economics, OUP

• Hayami and Godo, Development Economics, OUP

• Thirlwall; Growth and Development. 5th Edition

Discipline Specific Elective –A(2): ECO-A-DSE-6-A(2)-TH-TU

Money and Financial Markets [MFM] Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10] Total Credits: [5(Th)+1(Tu)]=6 , No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester-VI]

UNIT	TOPIC	LECTURES	RESPONSIBILITY
I	1. Introduction to money and Money and Banking 1.1 Concept, functions, measurement; theories of money supply determination.	5	IM
II	2. Financial Institutions, Markets, Instruments and Financial Innovations 2.1 Role of financial markets and institutions; problem of asymmetric information – adverse selection and moral hazard; financial crises 2.2 Money and capital markets: organization, structure and reforms in India; role of financial derivatives and other innovations 2.3 Why banks are special Institutions? How banks act as a leveraging mechanism?	17	IM
III	3. Financial Markets and Interest Rates Behaviour 3.1 Determination; sources of interest rate differentials; 3.2 Theories of term structure of interest rates; interest rates in India	18	IM
IV	4. Banking System 4.1 Balance sheet and portfolio management 4.2 Multiple Deposit Creation, 4.3 Determinants of the Money Supply. 4.4 Indian banking system- Changing role and structure- banking sector reforms	20	IM
V	5. Central Banking and Monetary Policy 5.1Functions, balance sheet; goals, targets, indicators and instruments of monetary control 5.2 Monetary management in an open economy; current monetary policy of India.	15	IM

Text

• F. S. Mishkin and S. G. Eakins, Financial Markets and Institutions, Pearson Education, 6th edition, 2009.

References

• F. J. Fabozzi, F. Modigliani, F. J. Jones, M. G. Ferri, Foundations of Financial Markets and Institutions, Pearson Education, 3rd edition, 2009.

• M. R. Baye and D. W. Jansen, Money, Banking and Financial Markets, AITBS, 1996.

• Rakesh Mohan, Growth with Financial Stability- Central Banking in an Emerging Market, Oxford University Press, 2011.

• L. M. Bhole and J. Mahukud, Financial Institutions and Markets, Tata McGraw Hill, 5th edition, 2011.

• M. Y. Khan, Indian Financial System, Tata McGraw Hill, 7th edition, 2011.

• N. Jadhav, Monetary Policy, Financial Stability and Central Banking in India, Macmillan, 2006. Page 46 of 75

• R.B.I. – Report of the Working Group: Money Supply Analytics and Methodology of Compilation, 1998.
• R.B.I. Bulletin, Annual Report and Report on Currency and Finance (latest).

Discipline Specific Elective- B(2) : ECO-A-DSE-6-B(2)-TH-TU

Environmental Economics [EE] Total Marks: 100 [Theory(Th) 65 + Tutorial(Tu) 15 + Internal Assessment 10+Attendance: 10] Total Credits: [5(Th)+1(Tu)]=6 , No. of Lecture hours: 75, No. of Tutorial contact hours: 15

[Semester- VI]

UNIT	TOPIC	LECTURES	RESPONSIBILITY
I	**1.** Introduction 1.1 What is environmental economics; **1.2** Review of microeconomics and welfare economics. **1.3** Interlinkages between the economy and environment	**7**	**AD**
II	**2.** Efficiency and Market Failure 2.1 Pareto optimality and market failure in the presence of externalities **2.2** Property rights and the Coase theorem **2.**3 Public goods/ bads and market failure	**18**	**AD**
III	**3.** The Design and Implementation of Environmental Policy 3.1 Pigouvian Fees – Single Polluter, Multiple Polluters, Fees vs Subsidies **3.2** Regulating Pollution : Command and Control, Economic Incentives **3.3** The Basic Theory of Tradeable Pollution Permits	**20**	**AD**
IV	**4.** International Environmental Problems 4.1 Transboundary Pollution – Transboundary Pollution as a problem of international externalities **4.2** International Trade and Environment – Pollution Havens **4.3** International Environmental Agreements – Basic idea about Montereal and Kyoto Protocol and Talks on Climate Change	**13**	**AD**
V	**5.** Measuring the values of Environmental Costs and Benefits 5.1 Concepts of Willingness to pay (WTP) and Willingness to accept compensation (WTAC), Difference between the two concepts **5.2** Concepts of Willingness to pay (WTP) and Willingness to accept compensation (WTAC), Difference between the two concepts	**17**	**AD**

Reference for unit 1:

Hanley N, Shogren J.F. & White B. Environmental Economics in Theory and Practice, Macmillan

Reference for unit 2:

Kolstad C, Environmental Economics, OUP

Reference for unit 3:

Kolstad C, Environmental Economics, OUP Hanley N, Shogren J.F. & White B. Environmental Economics in Theory and Practice, Macmillan

Reference for unit 4:

Hanley N, Shogren J.F. & White B. Environmental Economics in Theory and Practice, Macmillan Kolstad C, Environmental Economics, OUP Internet on Recent Environmental Agreements

Reference for unit 5:

Hanley N, Shogren J.F. & White B. Environmental Economics in Theory and Practice, Macmillan

Instrument Facilities

Instrument Facilities available in the laboratory
Department Of Botany

Sl. No.	instrument
1	Refrigerator
2	Micro oven
3	Overhead Projector
4	LCD Projector
5	Simple Microscope
6	Compound microscope
7	Weighing Ballance
8	Vortex Mixer
9	Autoclave
10	Digital Ph Meter
11	Incubator
12	Temperature Controlled Water Bath
13	Digital pan Ballace
14	Hot plate
15	Laminer Air Flow
16	Water Bath
17	Hot air Oven

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Kolkata-700 032

Instrument Facilities available in the laboratory
Department Of Botany

Light Microscope

Compound

Digital Balance

Autoclave

Instrument Facilities available in the laboratory
Department Of Botany

Laminar Air Flow

Incubator

Department	List of equipment	No.
Botany	Autoclave	1
	Hot plate	1
	Digital pan Balance	1
	Olympus Student Microscope	8
	Olympus Research Microscope	2
	Monocular Microscope	4
	Dissecting Microscope	15
	L.C.D Projector	1
	Appt. For Transpiration & Absorption	1
	Laminar Airflow	1
	Refrigerator	1
	Microwave oven	1
	Overhead Projector	1
	Compound microscope	30 (old Stock)
	Drawing Prism	25
	CPU	1
	VDU	1
	Incubator (RUSA)	1
	Water Bath (RUSA)	1
	Pan balance (RUSA)	1
	Autoclave (RUSA)	1
	Ph Meter (RUSA)	1
	Monocular Microscope (RUSA)	20
	Vortex	1
	Weighing Balance (RUSA)	1
Chemistry	Digital Conductivity meter	2
	Digital pH meter	2
	Potentiometer	2
	Calorimeter	1

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	Suction Pump	2
	Digital Potentiometer	1
	spectrophotometer	1
	Digital polarimeter	1
	Manual polarimeter	1
	Digital melting point	1
	Digital Balance	2
Microbiology		
	Vertical Autoclave	3
	Laminar Air Flow	3
	Binocular Microscope	25
	UV-Transilluminator	2
	Benchtop pH meter	2
	Precision balance	2
	Cold chamber	1
	Refrigerated Centrifuge	2
	Shaking Water bath	1
	BOD Incubator	3
	UV-Visible Spectrophotometer	2
	Mini vertical electrophoresis system with blotting	2
	Submarine Gel Electrophoresis System	2
	Thermal cycler	1
	Gel documentation system	1
	Centrifuge	2
	Distillation apparatus	1
	Hot air oven	1
	Sonicator	1
	Dry bath	1

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	Gel rocker	1
Physics	Zener diode	20
	Transistor	30
	I.C.	105
	Capacitor	20
	Breard board	11
	LED	20
	Hook up wire	2 coils
	Pot	4
	Jack	202
	Resistances	45
	Photo-transistor	2
	Relay	2
	Thermometer	1
	Hot plate	1
	DFW10	2
	Galvanometer	6
	Diode	25
	Prism	1
	9V Battery	4
	Multimeter	5
	Oscilloscope	1
	Bar pendulum	2
	Fly wheel	2
	Viscometer	1
	Searl's Apparatus	2
	Sextant	2
	Multimeter	3
	Stop watch	6
	Spirit level	6

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Physics	e/m of electron measurement set up	1
	Planck's constant measurement set up	1
	Ionization potential of Hg measurement set up	1
	Photoelectric effect and solar cell I-V characteristics measurement set up	1
	Tunnel diode set up	1
	Melde's apparatus	1
	Coefficient of thermal expansion measurement set up	1
	Thickness measurement of paper by forming wedge shape film set up	1
	Grating spectrum study set up	1
	Hydrogen spectrum measurement set up	1
	Oscilloscope	3
	MI measurement set up	2
	Refractive index of measurement set up	1
	Stefan's law verification set up	1
	Ammeter to voltmeter conversion set up	1
	Voltmeter to ammeter conversion set up	1
	Carey Fosters bridge set up	2
	Potentiometer arrangement	2
	Logic gates set up	5
	Spectrometer	4
	Lee's apparatus	1
	Deflection magnetometer	2
	Oscillation magnetometer	2
	Zener diode characteristics study kit	2
	Bridge rectifier kit	2
	Newton's ring set up	1

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	Double slit arrangement	1
	Polarimeter	1
	Platinum resistance thermometer	1
	Thermocouple set up	4
	Mutual inductance measurement set up	1
	LCR kit	3
	Four probe set up	1
	Hybrid parameter of transistor	1
	JFET characteristics set up	2
	Frequency response of transistor study set up	1
	OPAMP set up	5
	Wein bridge set up	1
	Temperature controller study set up	1
	Young's modulus measurement set up	2
	Rigidity modulus measurement set up	2
	Bar pendulum	2
	R-C trainer kit	1
	Polaroid pairs	2
	Fresnel's bi-prism set up	1
	Anderson's bridge set up	2
	Na vapour lamp	3
	Mercury vapour lamp	2
Physiology	Compound microscope	5
	Hemoglobinometer	2
	Electronic chemical weighing machine	1
	Kymograph	2
	Sphygmomanometer	3
	Stethoscope	4
	Stop watch	2

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	Weight machine	2
	Height scale	2
	Mary's tambour	2
Zoology	Simple Microscope	133
	Compound microscope	1717
	Digital pH meter	1
	Colorimeter	1
	UV UV Spectrophotometer	1
	Hot air ovenHot air oven	1
	BOD incubator	1
	Autoclave	1
	Digital micro balance	2
	Gel instrument(vertical 1+horizontal 1)	2
	Cold Cooling Cenrifuge	1
	Mini centrifuge	1
	Microtome	1
	Hot plate	1
	Refrigerator	1
	Binocular microscope	10
	Magnetic stirrer	1
	GPS recorder	1
	Chemical balance	1
	Tissue homogenizer	1
	Digital blood glucose monitor	1
	Digital BP meter	1
Journalism & Mass Communication	Apple iMac Desktop	1
	Camcorder (HD) XA	1
	Digital Compact Camera (Canon)	2
	Digital SLR Camera (Nikon)	1

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	Handycam (SONY)	1
	Camera Tripod	2
	Laser A3 Color Printer (XEROX)	1
	Laser A4 B/W Printer (HP)	1
	Studio Light (Simpex)	1
	Video Mixer (Black Magic)	1
	Audio Mixer (Yamaha)	1
	Boom Microphone (Ahuja)	3
	Studio Microphone (Behringer)	1
	Voice Microphone	1
	Headphone (Senheiser)	2
	Audio Recorder	1
	AM/FM Radio (Philips)	1
COMMON RESEARCH FACILITY	Thermal Cycler	1 Nos
	Vertical Gel System	1 Nos
	Submarine Gel System	1 Nos
	BOD Incubator with Shaker	2 Nos
	Refrigerator	1 Nos
	CO_2 Incubator	1 Nos
	Phase Contrast Microscope	1 Nos
	Vertical Autoclave	1 Nos
	Laminar Air Flow	3 Nos
	Water Bath without Shaker	1 Nos
	Water Bath without Shaker	2 Nos

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	High Precision digital balance	1 Nos
	Benchtop pH meter	1 Nos
	Centrifuge	2 Nos
	Cold Centrifuge	1 Nos

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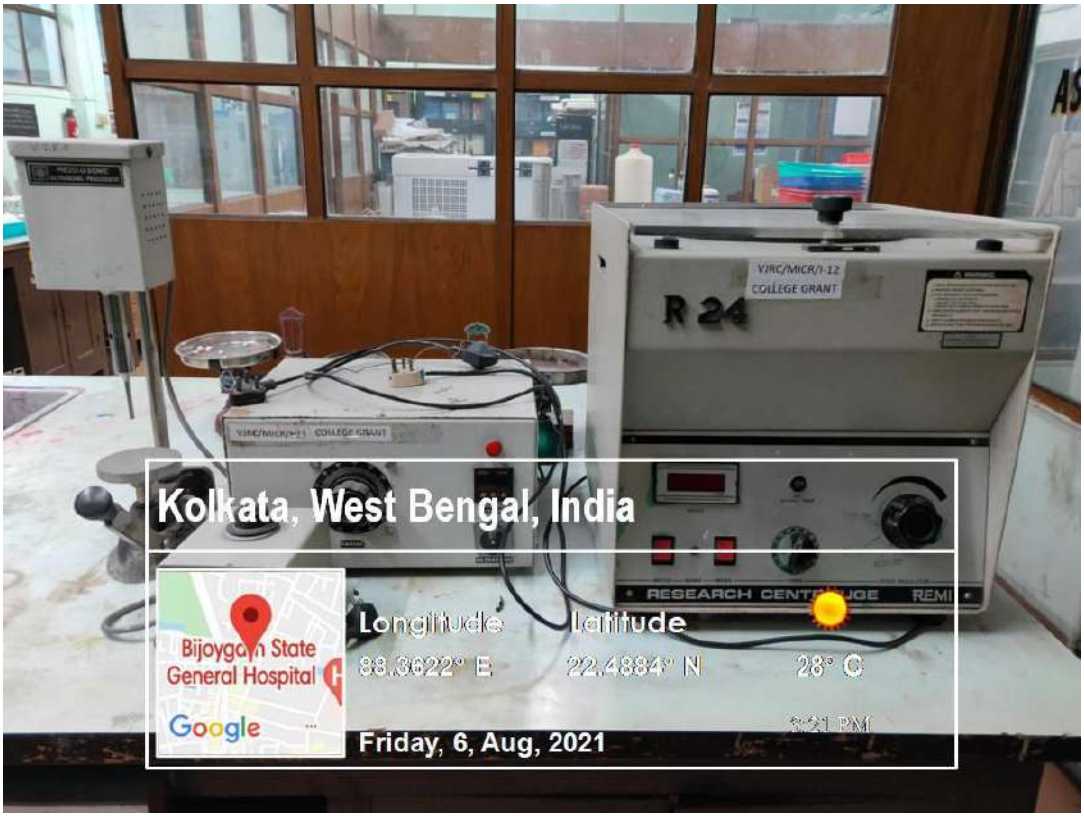
Sample Pictures of Instruments

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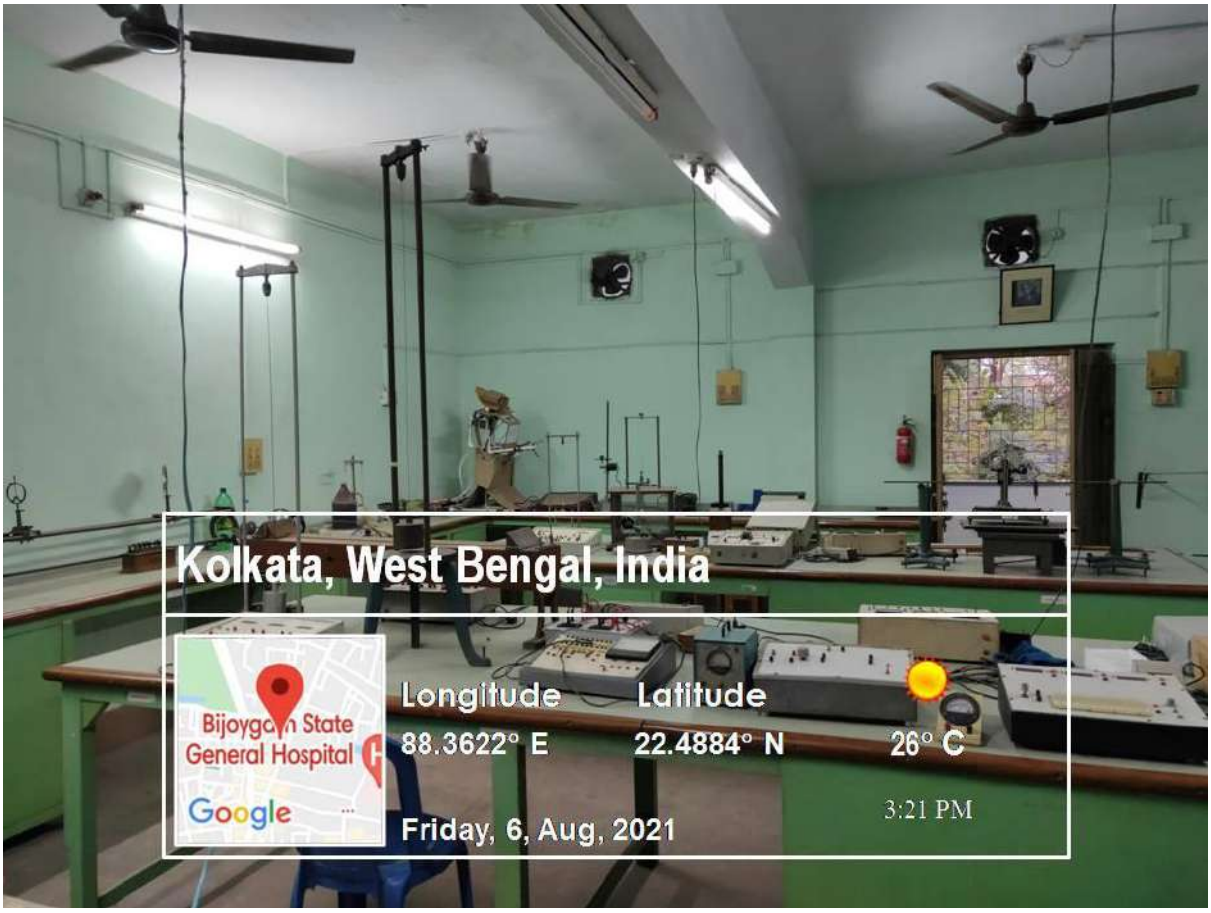
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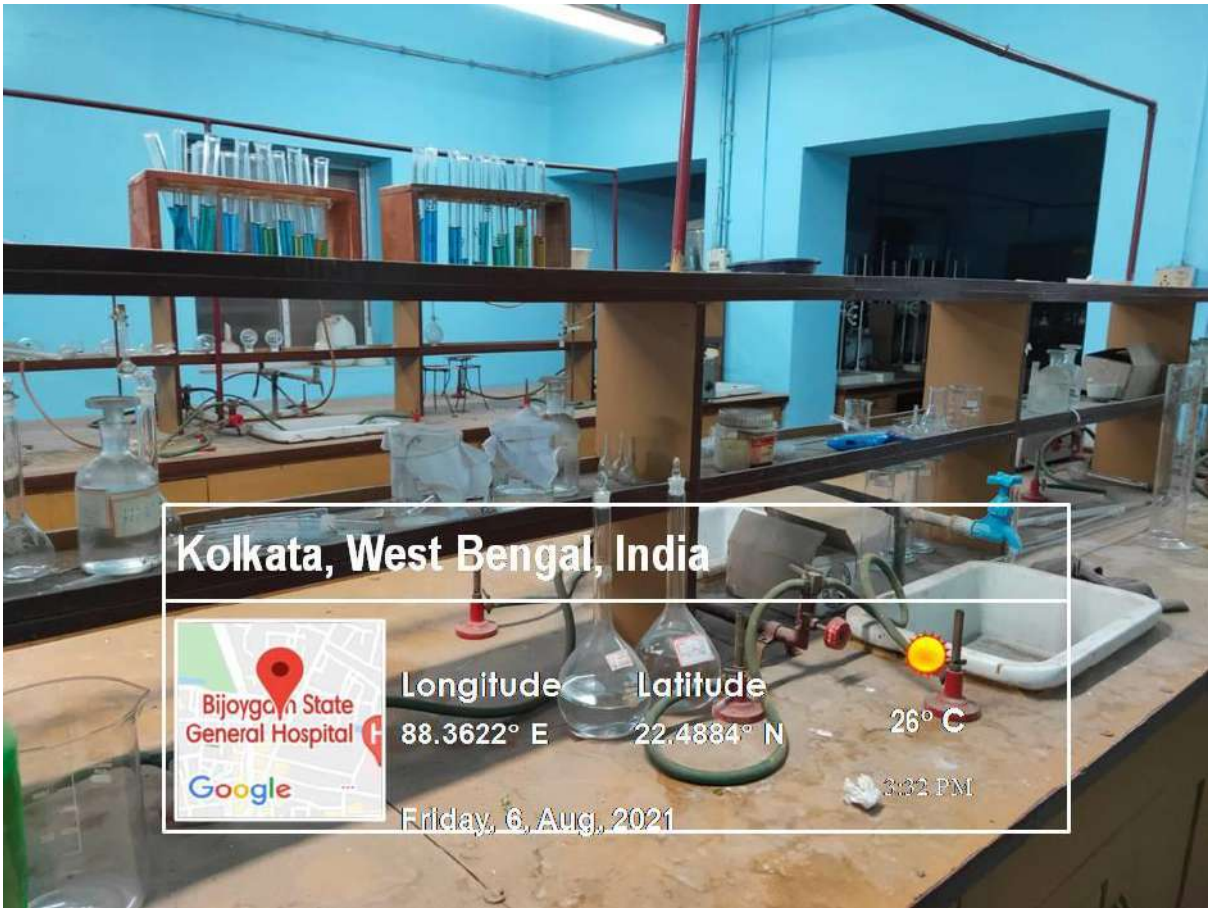
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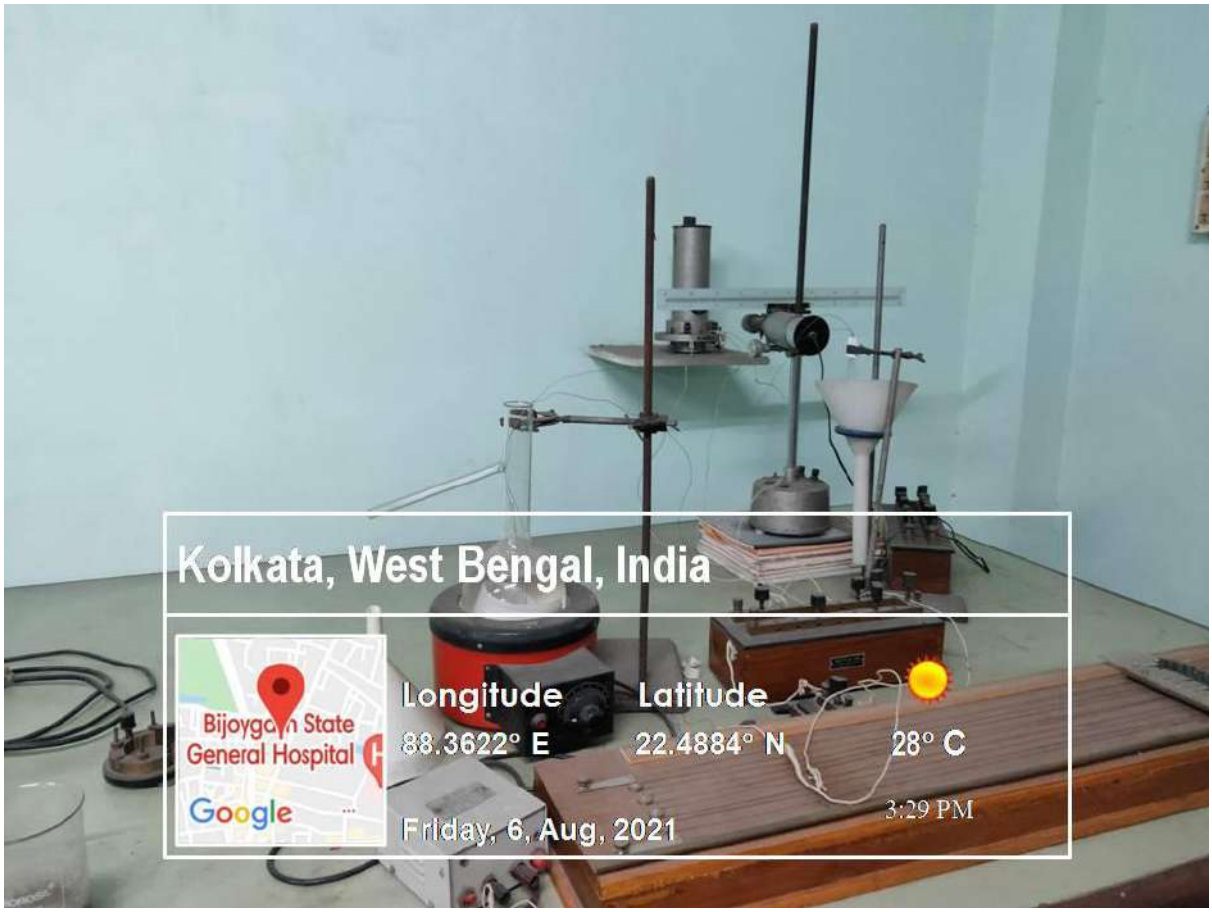
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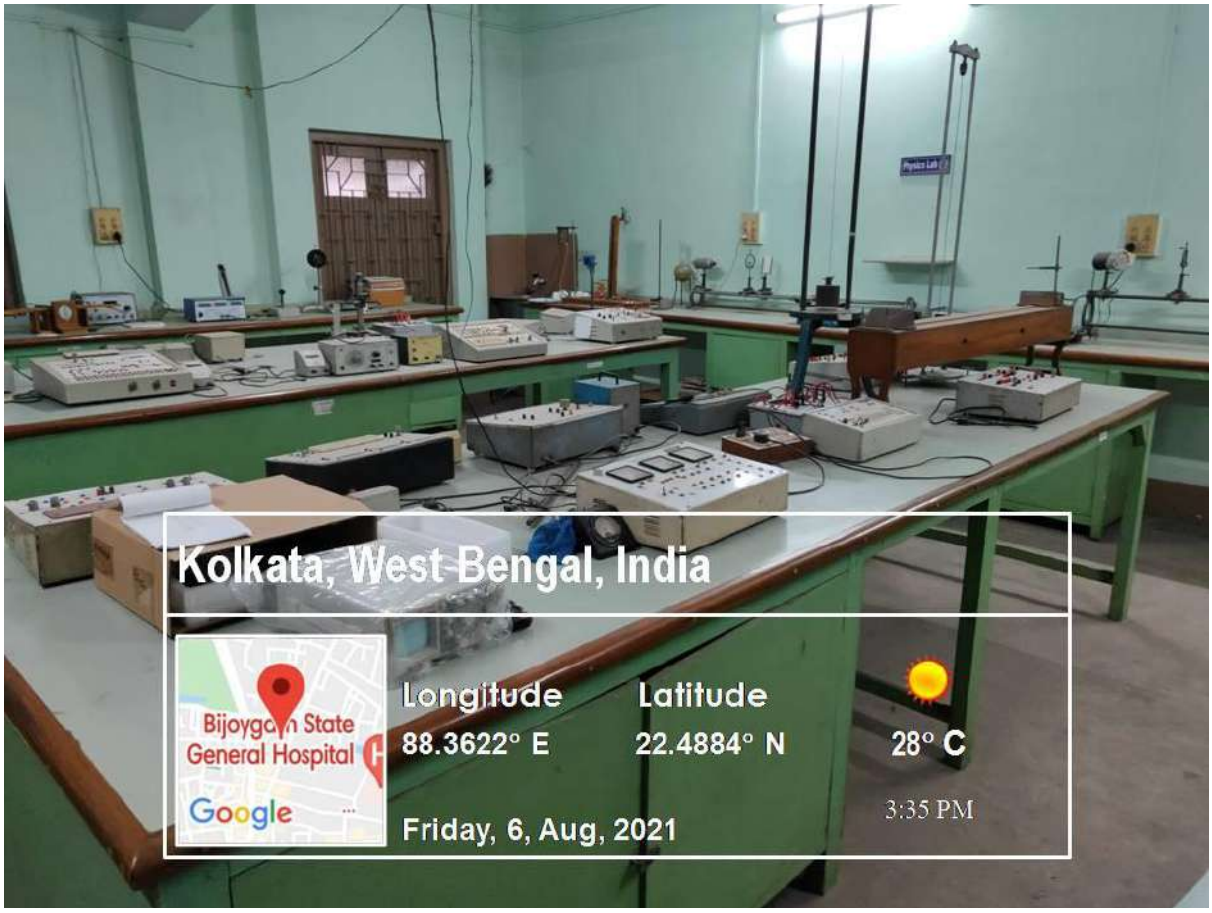
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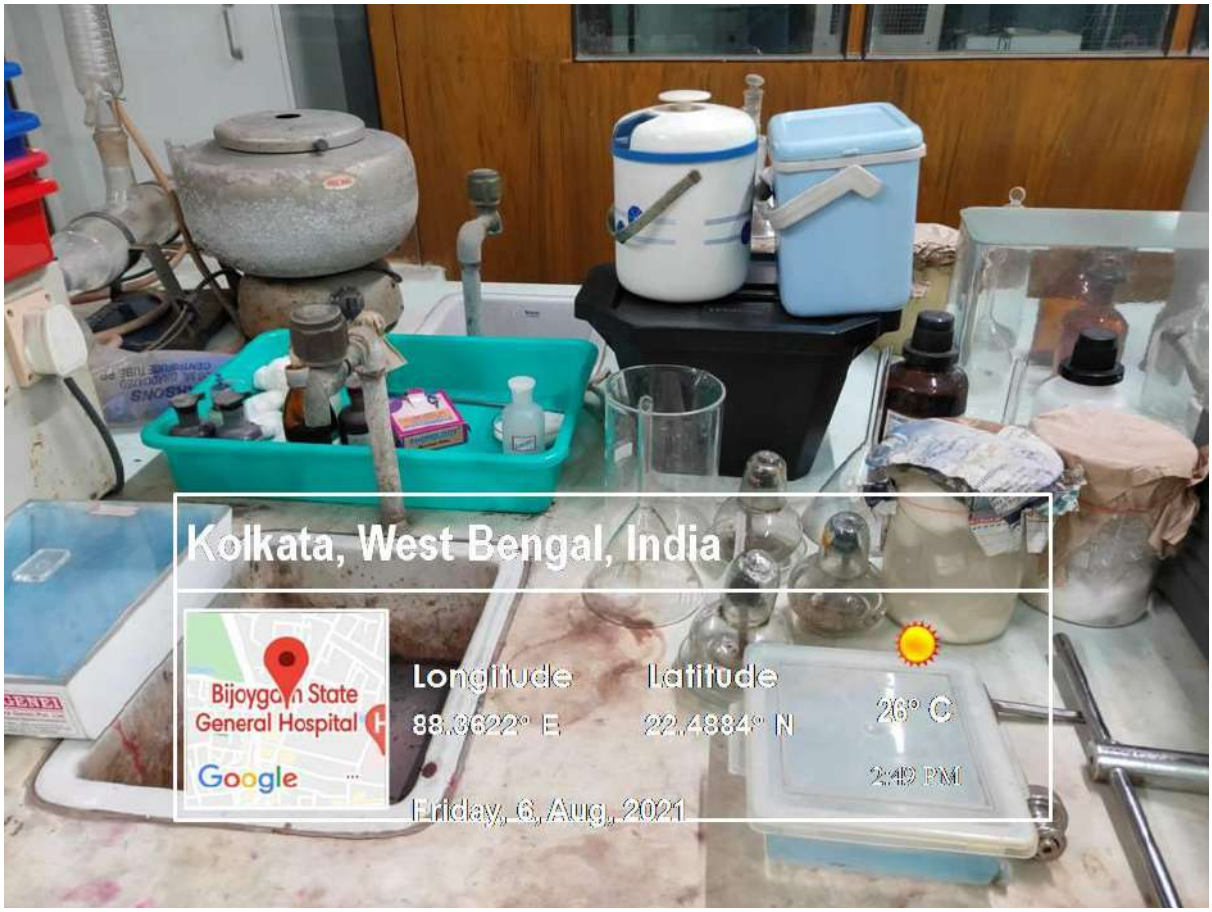
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E-Content

Content Using ICT Details 2021-22

Department	Name of the Faculty	Link of the Content
Botany	Dr. Manjira Ghosh	https://docs.google.com/presentation/d/1B2vs70VR6uavcZPxJdaDLvzKjnW0m1GZ/edit?usp=sharing&ouid=114523173556621742364&rtpof=true&sd=true
		https://drive.google.com/file/d/1NFUSw0du-E4l_n7zNZoKhJXumWdlGvvQ/view?usp=sharing
Botany	Dr. Aditi Chatterjee	https://drive.google.com/file/d/1zx0TKGtMsCo3MGRy4C78ETZESxcouuSX/view?usp=drivesdk
		https://docs.google.com/document/d/14ZthfuVxBoG_XydyXJET6L-x58pyABXm/edit?usp=drivesdk&ouid=106579764526238652749&rtpof=true&sd=true
Botany	Dr. Bulbul Biswas	https://drive.google.com/file/d/1BoZTgBcX58Shcos1_KFH7ef5lLO9H0Jr/view?usp=sharing
		https://drive.google.com/file/d/1hzTcQsdMDUpEv7d-crd4uQwTqBkpzvX5/view?usp=sharing
Botany	Nanda Khan	https://docs.google.com/presentation/d/1Nif-C09dPEPkPHJ8AXcuRxNx0hXz1WeZ/edit?usp=sharing&ouid=101495868312672938978&rtpof=true&sd=true
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Botany	Dr. Urmi Roy	https://drive.google.com/file/d/1UGn997UIXqkyP5t5lJ6IGjfzIHW_oUSY/view?usp=sharing
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Botany	Dr Mahua Bhattacharya	https://docs.google.com/presentation/d/19RGClDn_RJ_XvZBrg38RPI6j85Qrfj4E/edit?usp=share_link&ouid=114523173556621742364&rtpof=true&sd=true
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English	Dr. Swati Roy Chowdhury	https://docs.google.com/spreadsheets/d/1kbCwSP2vMHShFbocDfJjZJX_V7w-bY7H/edit?usp=drivesdk&ouid=108141988206082858559&rtpof=true&sd=true
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History	Dr. Samiparna Rakshit	https://docs.google.com/presentation/d/1DwHXxJCjFQdAfVwR8JwlyH1StOCh1cvO/edit?usp=sharing&ouid=111569620126611578519&rtpof=true&sd=true
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Mathematics	Chiranjit Ghorui	https://drive.google.com/file/d/1gUVs-f0OzhuWN_g8HSagcMMO8l7NB4t3/view?usp=drivesdk
Economics	Dr. Isita Mukherjee	https://docs.google.com/document/d/1Ki3GE5LgQA75zM03LmLZ-S72ZpqS-y-4/edit?usp=sharing&ouid=106673260228198653170&rtpof=true&sd=true
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Chemistry	Dr. Debopam Sinha	https://drive.google.com/file/d/11oQ2m7PINm3Zg7gUI4__KDe9TjUv9ig1/view?usp=share_link
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Chemistry	Dr. Dasarath Mal	https://drive.google.com/file/d/1kQ1P7Jp2nGAKgCpBflbnk-5BzEXv-QPN/view?usp=share_link
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Chemistry	Dr. Anindita Mukherjee	https://docs.google.com/presentation/d/146QAvfk4b6SUWAwVJE0GQHJ6trvvrhU3/edit?usp=share_link&ouid=108212196610741110518&rtpof=true&sd=true
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Chemistry	Dr. Sumita Roy	https://drive.google.com/file/d/1hXK9dZVd-N1oOWzUEDoYNlSNG1Ymlvrk/view?usp=share_link
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Zoology	Aditi Ghosh	https://drive.google.com/drive/folders/1hdgtncQHrlDqWDrKg3BKsXn0iAs-s5Za?usp=share_link
Zoology	Ranita Bhattacharya	https://drive.google.com/file/d/1Vz-xrCvILuSLZXT6W-N12wNR0AvQJ1u8/view?usp=drivesdk
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Zoology	Munmun Chatterjee	https://drive.google.com/drive/folders/1HnFLZjCNLGPmuJWLha4-zpEOVVZG1W6M?usp=share_link
BENGALI	Dr. Buddhadev Adhikary	https://docs.google.com/presentation/d/1xfTHv2P9iAmCfh64YbUdoaACX5ZbYx6B/edit?usp=share_link&ouid=100066187452700431124&rtpof=true&sd=true
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BENGALI	DR. UTTAM KUMAR MUKHERJEE	https://docs.google.com/presentation/d/1syp3qbFSi941_pDf_C0zE__wcys67WpH/edit?usp=share_link&ouid=111495469335104342971&rtpof=true&sd=true
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Bengali	DR. ANURADHA GOSWAMI	https://drive.google.com/file/d/1W470abhJ0fILakdvEyGY1gYcF7Uj-4gC/view?usp=share_link
Physics	Debashis Chatterjee	https://drive.google.com/drive/folders/11XcemL9KWhosF1Q46S4N-PJzfhnmb_Lg
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Physics	Sujit Nandy	https://drive.google.com/drive/folders/1_Uu80fBbwDhIeqdVw4x_ajEsG_Ep7G1nGwBIeIht7HJQwhT4AwiWf1zMT08REF2L0HckGAGc
Commerce	Prabir Bhattacharya	https://docs.google.com/document/d/1z-zw-HC_I3ms7DyOHkYnEJZtKy99P6J2/edit?usp=sharing&ouid=117762525287305708788&rtpof=true&sd=true
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Microbiology	Dr. Sudip Samadder	https://drive.google.com/file/d/1SXlYYg6ukG1kVMsW_YthazFNcY1qmJjx/view
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Microbiology	Dr.Sampa Debnath	https://docs.google.com/presentation/d/1hSvEl_7sgJBk0yYnfeuyPQ48MNJraQSH/edit?usp=share_link&ouid=114701878518111919238&rtpof=true&sd=true
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Microbiology	Dr. Gargi Saha Kesh	https://docs.google.com/presentation/d/1Gn0M07HcgvXDCM70UNNdMT04VPlv3LQ_f7KAVoSN4oE/edit?usp=share_link
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Microbiology	Ms. Sahana Ghosh	https://drive.google.com/file/d/1_GljHBXv3oN8H-bG7WQH23xhbJrn0wZH/view?usp=share_link
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Microbiology	Mr. Pinaki Hazra	https://doc-0s-8c-prod-02-apps-viewer.googleusercontent.com/viewer2/prod-02/pdf/u8uteod6or7ee8aiabjrlje17mpb13l8/lp5s7jkcqrdoc9rpshbo03opifdjnkd6/1676183925000/3/10475164234232796562 8/APznzaZcKufTfyj8cqmTkpLfViMYYaXCq_0O9BFUgLaoSGZHQfhr2TNyPfZPrfmlc8mIYGhaWhzUgCjtSVJRhNvejxqbdIZtMGB7iB9h8FcQi6CH6S1zImEYc8t902EQ93nNI9xkCNszfoYwCxvv1XkXem9LE7zfaqHqlTkoQNMpMfocsbEk71w72MD5t0158uLu99EgIXju-h1uDPO_gM6IhUhBRJHAP199o2M2eKin32k7pOhnhbaYU6wbG8EUnX1_HgPw8lFu5dHsSHwe86vs6HFaRnqgEOGEjm474mAUbklkfG_mwx9MYuUZnkOG44nqXXtpAAWcgWW0LlT-VBAD4F5fw==?authuser=0&nonce=abqu7j5olk7qg&user=10475164234232796562 8&hash=89mi88na2dt0a8c53b6msg4fagrahq19
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Microbiology	Dr. Saswati Gayen	https://drive.google.com/drive/folders/1wWw-vZ-JSiHfhte54IjJeRBfqDt6JyOq?usp=share_link

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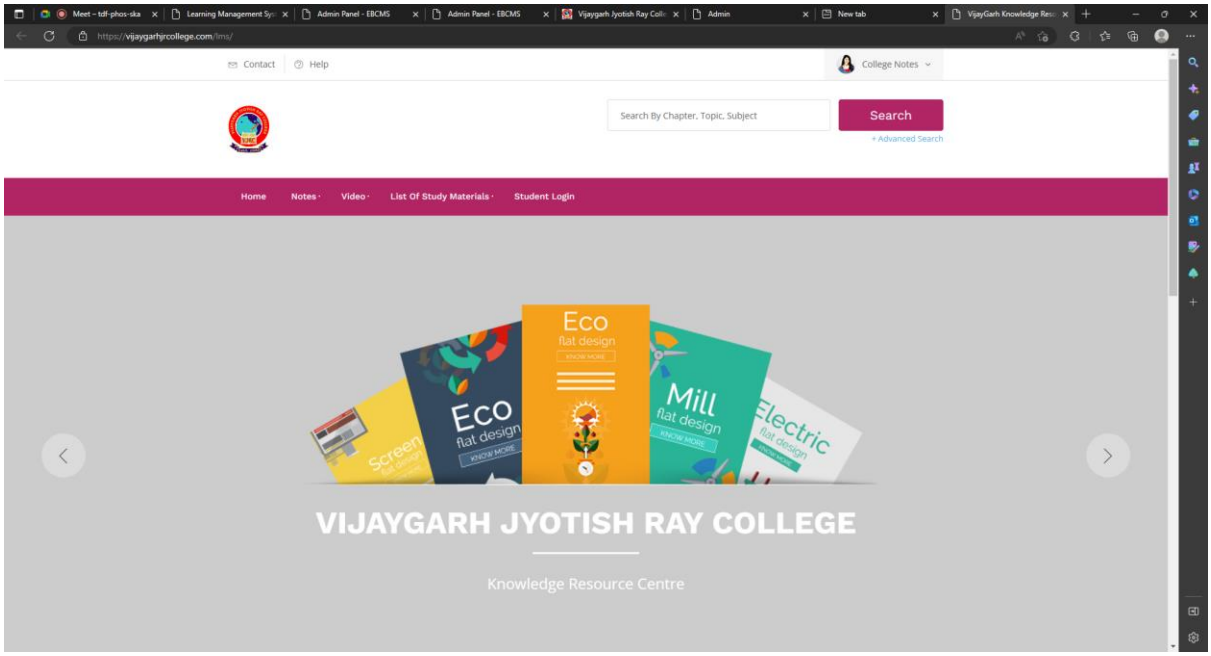
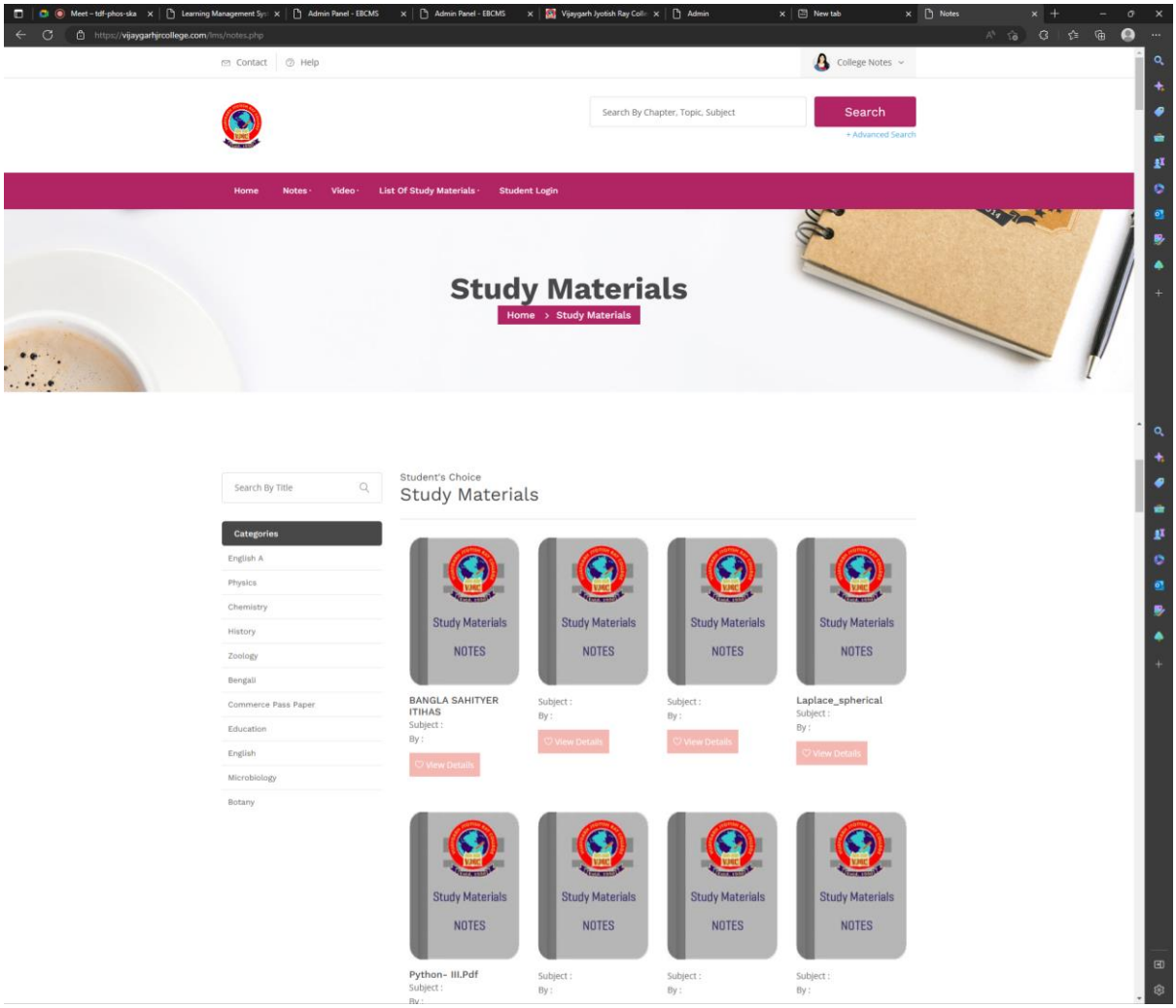
Learning Management System

Notes Section





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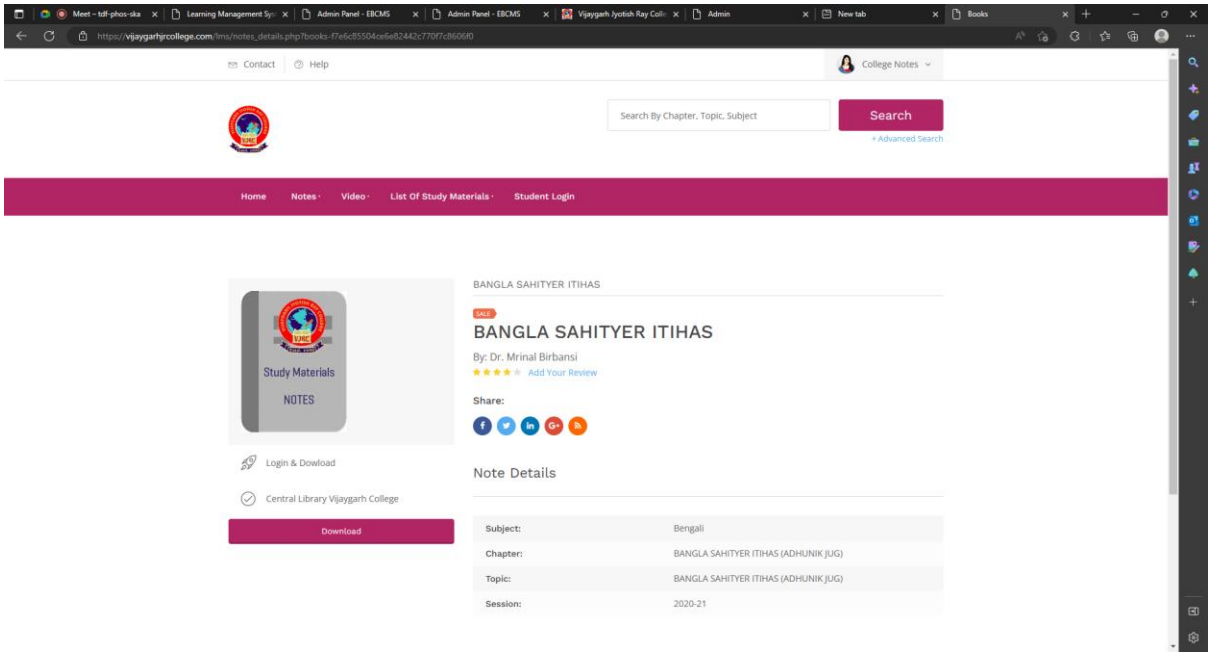
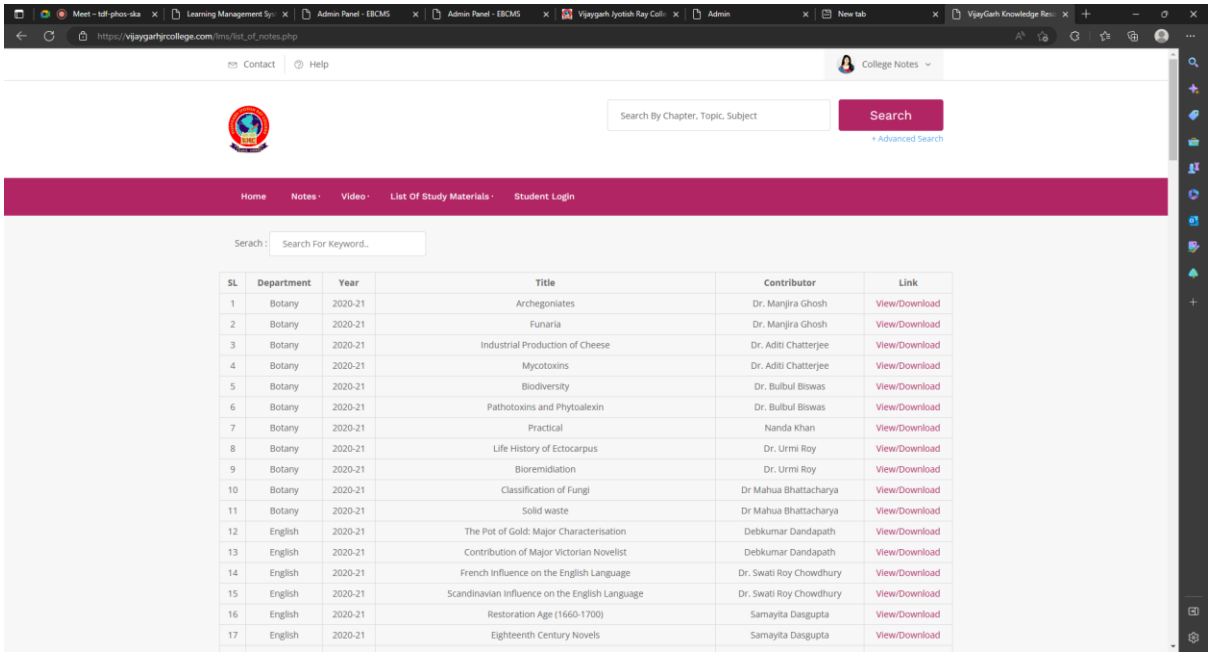


List of Study Materials



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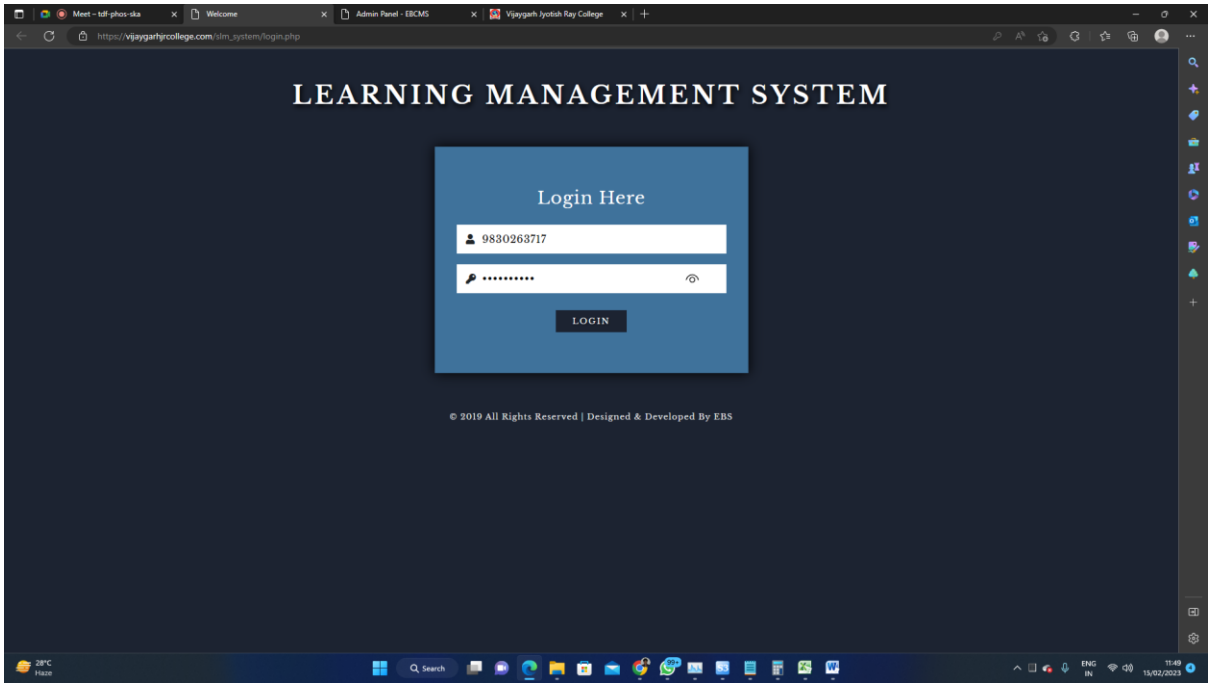

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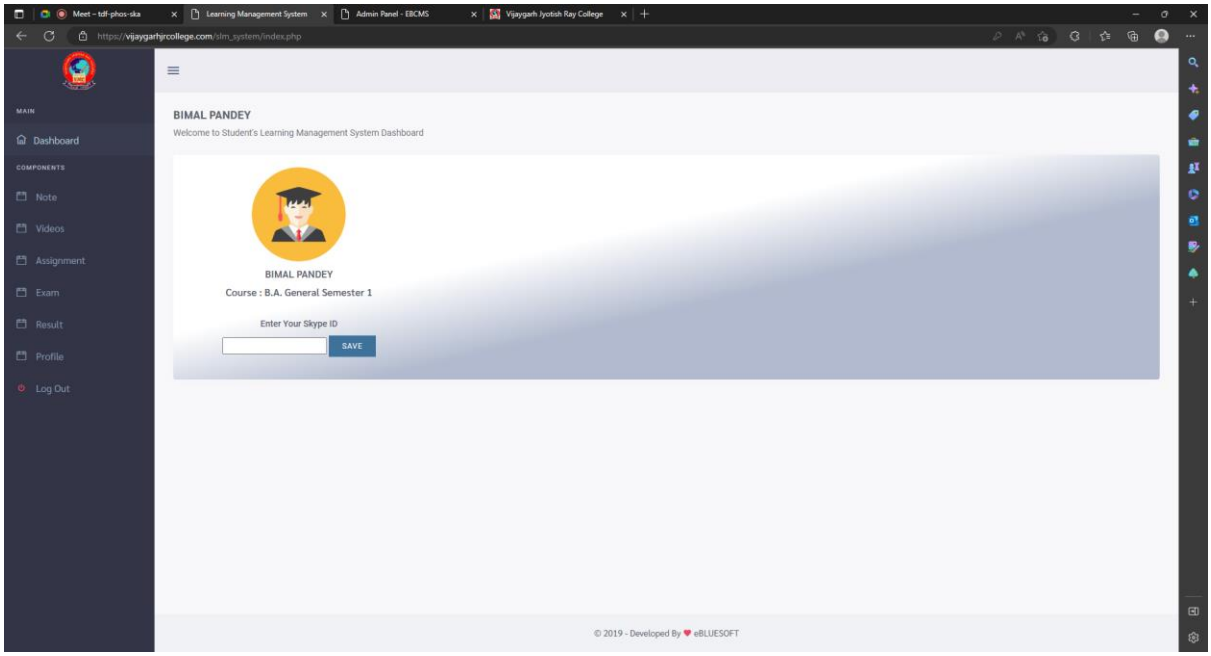

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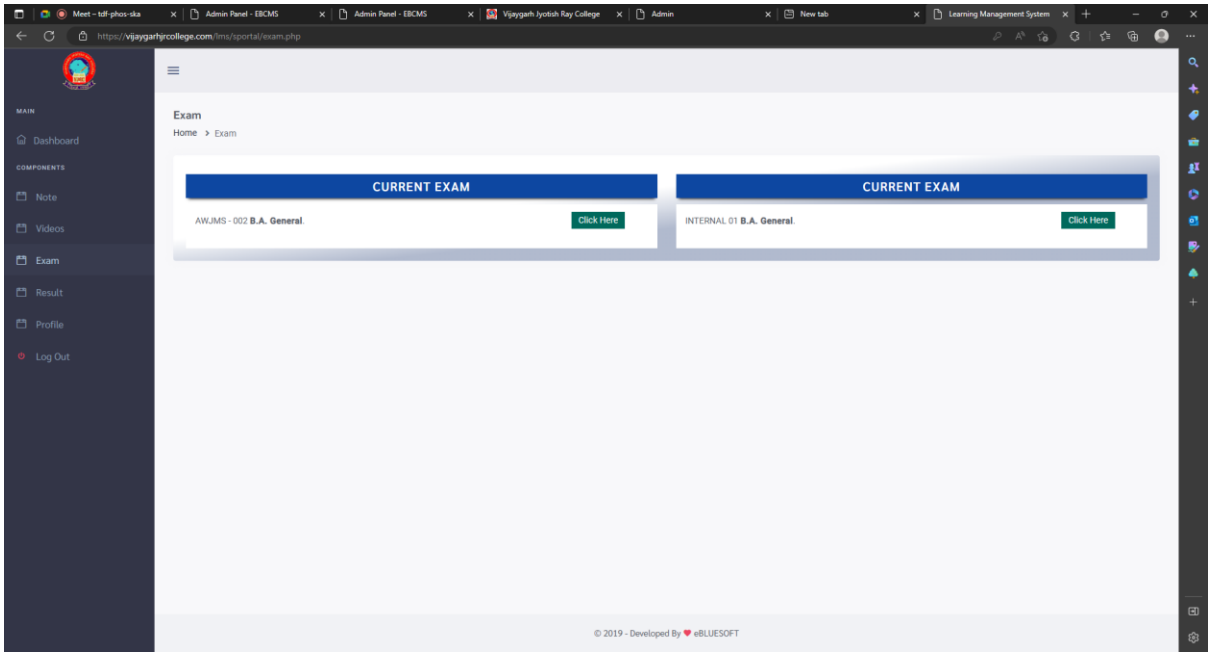

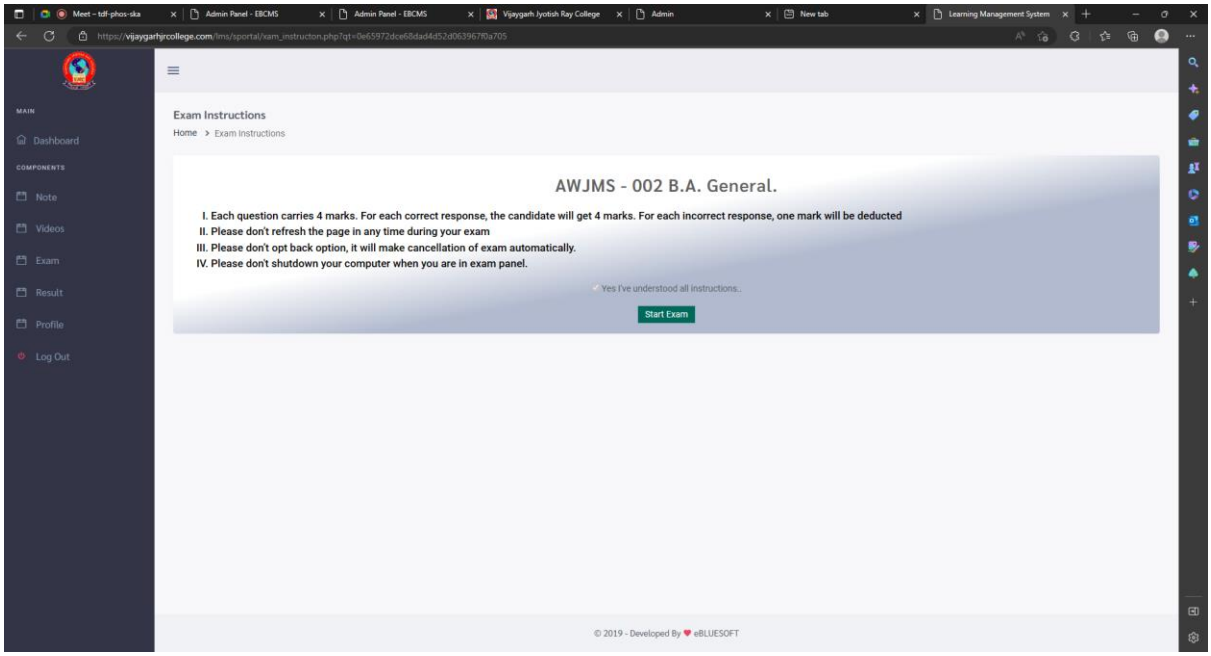
Exam Instructions
Home > Exam instructions
AWJMS - 002 B.A. General.
I. Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For each incorrect response, one mark will be deducted
II. Please don't refresh the page in any time during your exam
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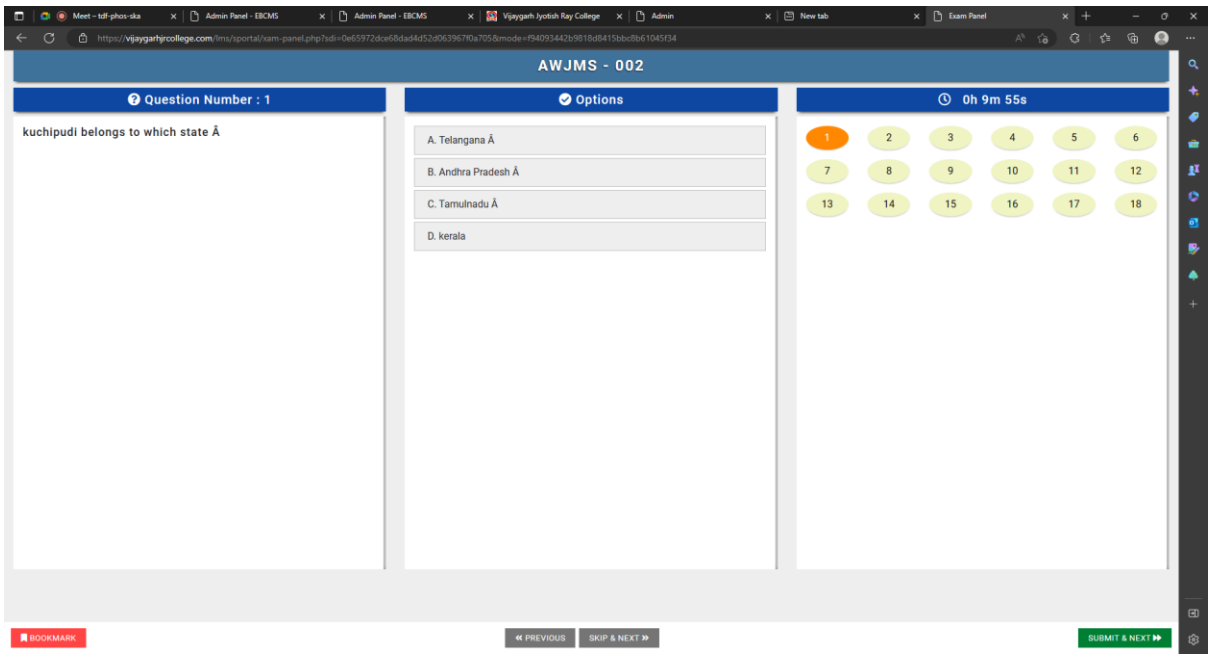
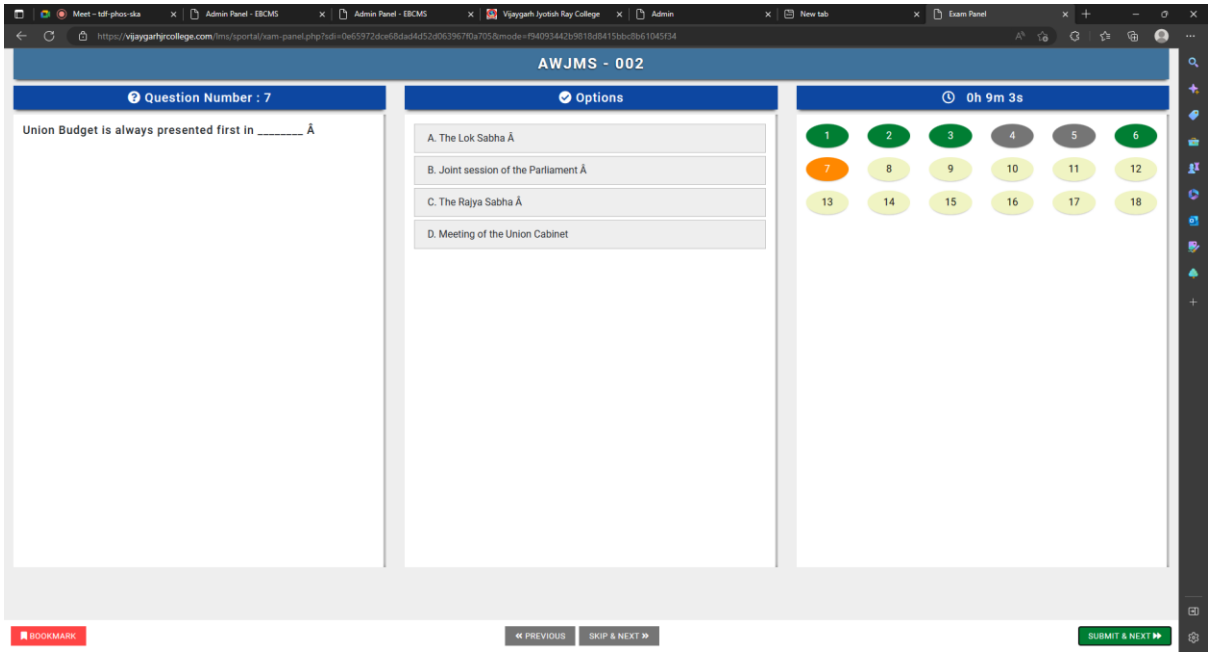
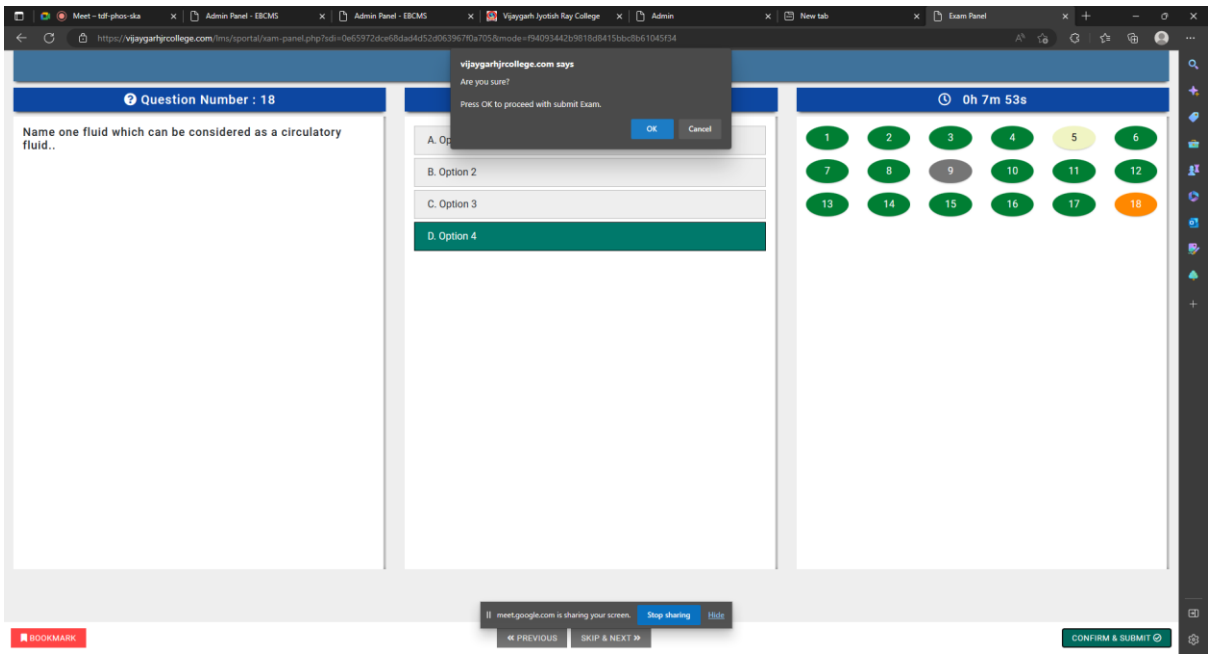
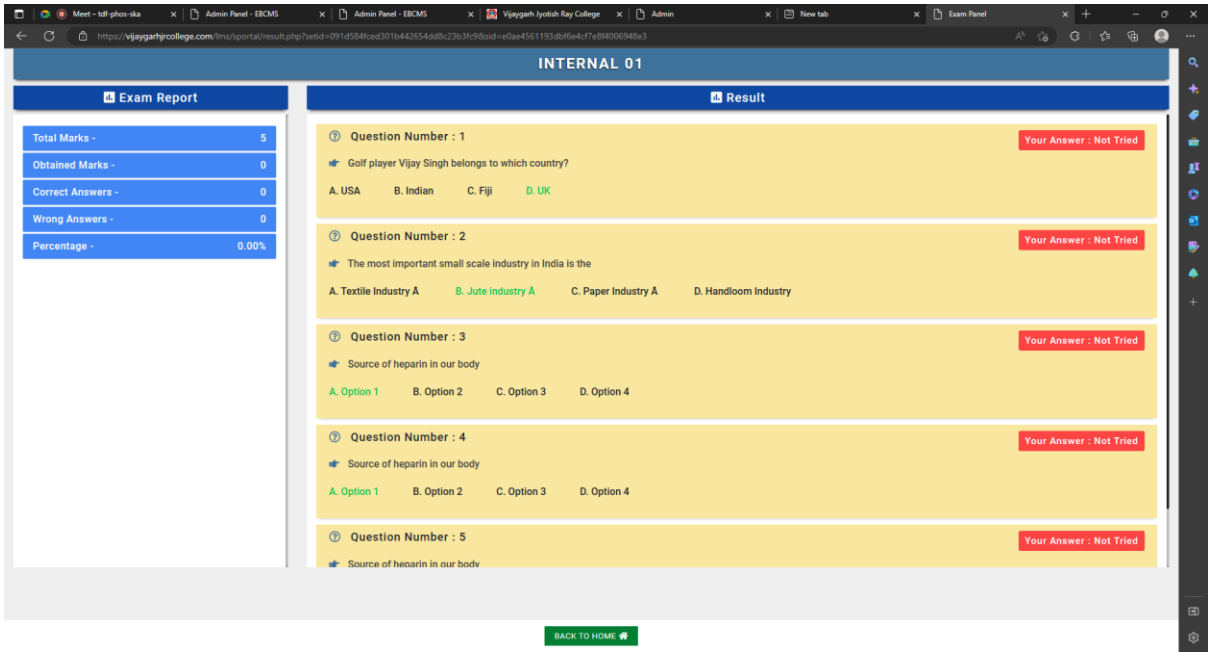
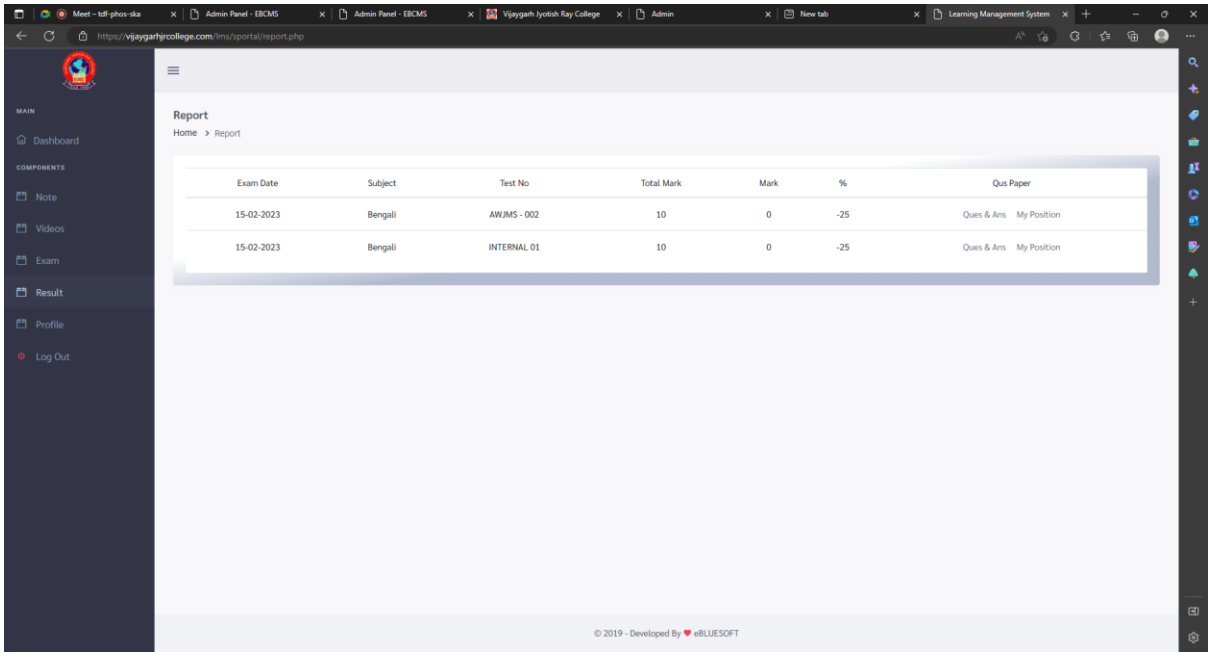

AWJMS - 002
Question Number : 1
kuchipudi belongs to which state Â
Options
A. Telangana Â
B. Andhra Pradesh Â
C. Tamulnadu Â
D. kerala
0h 9m 55s
BOOKMARK
« PREVIOUS
SKIP & NEXT »
SUBMIT & NEXT



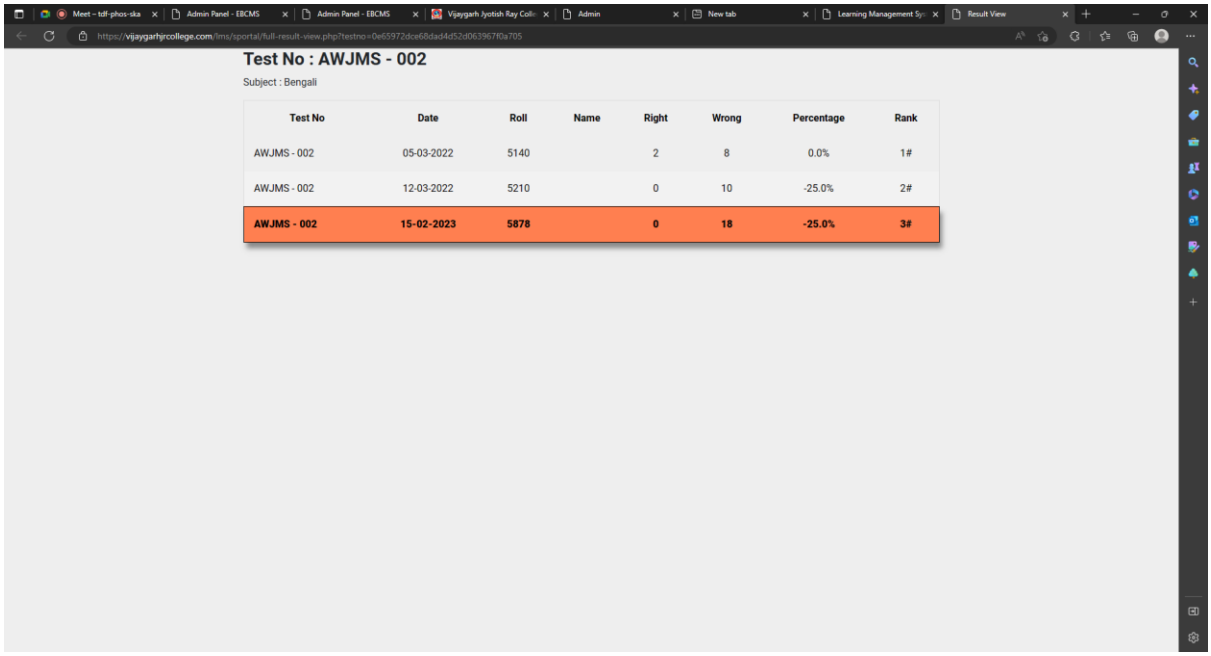


Result screen in details





Rank/Position



Test No : AWJMS - 002

Subject : Bengali

Test No	Date	Roll	Name	Right	Wrong	Percentage	Rank
AWJMS - 002	05-03-2022	5140		2	8	0.0%	1#
AWJMS - 002	12-03-2022	5210		0	10	-25.0%	2#
AWJMS - 002	**15-02-2023**	**5878**		**0**	**18**	**-25.0%**	**3#**

LMS LINK

https://vijaygarhjrcollege.com/clg_lms/

Sample Letter of BoS Member

Gmail

Prasenjit Das <pdmicrobio@gmail.com>

Members in P.G. B.O.S. from affiliated U.G. Colleges offering P.G. Course

2 messages

Amit Ray <secretarysta@gmail.com> Wed, Sep 26, 2018 at 2:05 PM
To: Sagarmoy Ghosh <sgmicrobio@caluniv.ac.in>, Prasenjit Das <pdmicrobio@gmail.com>, aparnasen_mac@yahoo.co.in, rajneogy@gmail.com, office@ladybrabourne.com

No…….. ***Dated……..26.09.2018***

To
The Head
Department of Microbiology
University of Calcutta

Sub : Members in P.G. B.O.S. from affiliated U.G. Colleges offering P.G. Course

Dear Sir / Madam,

In reference to above , I am to inform you that Hon'ble Vice Chancellor , University of Calcutta has been pleased to nominate the following members in P.G.B.O.S. as proposed by the respective Principal of the College.

Subject: **PURE MICROBIOLOGY**

Vijaygarh Jyotish Ray College	MI2	2005	Dr. Prasenjit Das	9433285855	pdmicrobio@gmail.com
Lady Brabourne College	MI3	2005	Dr. Aparna Sen	9831100864	aparnasen_mac@yahoo.co.in

You are requested to take for the necessary action from your end.

With warm regards,

Secretary, UCSTA

Copy to the 1. Principal of the Vijaygarh Jyotish Ray College

2. Principal of the Lady Brabourne College

3. Respective Faculty members

RAJYASRI NEOGY <rajneogy@gmail.com> Fri, Sep 28, 2018 at 1:20 PM
To: Prasenjit Das <pdmicrobio@gmail.com>

[Quoted text hidden]

Rajyasri Neogy
Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

UNIVERSITY OF CALCUTTA

Telephone : (033) 2461-5445/5277/4711
(Ext. 430)
Fax No. (033) 2461-4849

COLLEGE OF SCIENCE
DEPARTMENT OF BIOCHEMISTRY
35, Ballygunge Circular Road
Kolkata – 700 019, India
Website : http://biochem.caluniv.in

Ref. ..... *Date :* .....

Certificate of Appreciation

On behalf of the Under Graduate Board of Studies in Microbiology (UGBOS) of the Calcutta University, I would like to formally and sincerely express my gratitude to **Dr. Prasenjit Das**, Assistant Professor, Vijaygarh Jyotish Ray College, Kolkata for the amazing work he accomplished in preparing the practical manual (MCB-A-CC-3-6-P; CC6: Microbial Physiology and Metabolism and MCB-A-DSE-B-6-1-P; DSE-B-1: Inheritance Biology) for Under Graduate Microbiology Courses as per the CBCS syllabus. This was a new level of responsibility and leadership for him, and he performed exceptionally well organizing the entire project to successful completion.

Once again, thanking him for his outstanding accomplishment.

Sanjay Ghosh 26/01/2021

Dr. Sanjay Ghosh
Chairman
UGBOS
Microbiology
University of Calcutta

Dr. Sanjay Ghosh
Professor
Department of Biochemistry
University of Calcutta

UNIVERSITY OF CALCUTTA

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Website : http://biochem.caluniv.in

Ref. ..... *Date :* .....

Certificate of Appreciation

On behalf of the Under Graduate Board of Studies in Microbiology (UGBOS) of the Calcutta University, I would like to formally and sincerely express my gratitude to **Dr. Saswati Gayen**, Assistant Professor, Vijaygarh Jyotish Ray College, Kolkata for the amazing work she accomplished in preparing the practical manual (MCB-A-DSE-A-5-1-P; DSE-A-1: Microbial Biotechnology) for Under Graduate Microbiology Courses as per the CBCS syllabus. This was a new level of responsibility and leadership for her, and she performed exceptionally well organizing the entire project to successful completion.

Once again, thanking Dr. Saswati Gayen for her outstanding accomplishment.

Sanjay Ghosh

Dr. Sanjay Ghosh
Chairman
UGBOS
Microbiology
University of Calcutta

26/01/2021

Dr. Sanjay Ghosh
Professor
Department of Biochemistry
University of Calcutta

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Kolkata 700 019, India
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Ref. ..... *Date :* .....

Certificate of Appreciation

On behalf of the Under Graduate Board of Studies in Microbiology (UGBOS) of the Calcutta University, I would like to formally and sincerely express my gratitude to **Dr. Shilajit Barua**, Assistant Professor, Vijaygarh Jyotish Ray College, Kolkata for the amazing work he accomplished in preparing the practical manual (MCB-A-CC-3-5-P; CC5: Virology, MCB-A-DSE-A-5-2-P; DSE-A-2: Advances in Microbiology) for Under Graduate Microbiology Courses as per the CBCS syllabus. This was a new level of responsibility and leadership for him, and he performed exceptionally well organizing the entire project to successful completion.

Once again, thanking Dr. Shilajit Barua for his outstanding accomplishment.

Sanjoy Ghosh

Dr. Sanjay Ghosh
Chairman
UGBOS
Microbiology
University of Calcutta

26/01/2021

Dr. Sanjay Ghosh
Professor
Department of Biochemistry
University of Calcutta

UNIVERSITY OF CALCUTTA

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DEPARTMENT OF BIOCHEMISTRY
35, Ballygunge Circular Road
Kolkata – 700 019, India
Website : http://biochem.caluniv.in

Ref. .....

Date : .....

Certificate of Appreciation

On behalf of the Under Graduate Board of Studies in Microbiology (UGBOS) of the Calcutta University, I would like to formally and sincerely express my gratitude to **Dr. Sampa Debnath**, Associate Professor, Vijaygarh Jyotish Ray College, Kolkata for the amazing work she accomplished in preparing the practical manual (MCB-A-DSE-A-5-1-P; DSE-A-1: Microbial Biotechnology) for Under Graduate Microbiology Courses as per the CBCS syllabus. This was a new level of responsibility and leadership for her, and she performed exceptionally well organizing the entire project to successful completion.

Once again, thanking Dr. Sampa Debnath for her outstanding accomplishment.

Sanjay Ghosh

Dr. Sanjay Ghosh
Chairman
UGBOS
Microbiology
University of Calcutta

26/01/2021
Dr. Sanjay Ghosh
Professor
Department of Biochemistry
University of Calcutta

Report of Academic Committee
&
Examination Committee Meetings

Phone : 033-2412-4082
VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

Report of Academic Committee meetings held for the session 2021-22

Phone : 033-2412-4082
VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

Academic Committee Meeting Notice

A meeting will be held on 15.6.2021, tomorrow at 7pm on Google platform. All departments are requested to attend. Link will be provided in due time.

Agenda: 1.Admission.

2. Information regarding submission of AQAR 2019-20.

3. Discussion of different activities during the current session.

4. Misc.

Phone : 033-2412-4082
VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

First meeting held on 15.06.2021 in online platform

Link of Meeting: https://meet.google.com/dzz-wtmj-dvs

Members Present:

1. Dr. Rajyasri Neogy, Principal
2. Dr. Mrinal Birbanshi , Convener
3. Dr. Prasenjit Das, HOD, Dept. of Microbiology
4. Dr. Avijit Das, HOD, Dept. of Economics
5. Sri Prabir Bhattacharya, HOD, Dept. of Commerce
6. Dr. Samiparna Rakshit, HOD, Dept. of History
7. Dr. Pinaki Chakraborty, HOD, Dept. of Zoology
8. Dr. Sumita Roy, HOD, Dept. of Chemistry
9. Sri Debashis Chaterjee, HOD, Dept. of Physics
10. Ms. Soma Mujumdar, HOD, Dept. of Physiology
11. Dr. Swarnali Sharma, HOD, Dept. of Mathematics
12. Dr. Urmi Roy, HOD, Dept. of Botany
13. Dr. Swati Roy Chowdhur, Representative Dept. of English
14. Dr. Arnab Banerjee, HOD, Dept. of Journalism & Mass Comm
15. Dr. Ruma Roy, HOD, Dept. of Political Science
16. Dr. Laxmi Saha, HOD, Dept. of Philosophy
17. Dr. Amalendu Mujumdar, HOD, Dept. of Education

Resolutions of the meeting

1. An admission committee has been formed to conduct the admission in the session 2021-22. Convenor and members are continued as it was in 2020-21.

2. As AQAR 2019-20 submission extends its time, so all departments are requested to submit departmental report along with teacher's self appraisal.

3. All departments are requested to organize online meeting to set up admission criteria for their department and submit it to the admission convener.

4. All departments are requested to plan for academic activities as well as extracurricular activities for their students.

5. All departments are requested to conduct parent -teacher meeting virtually.

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VIJAYGARH JYOTISH RAY COLLEGE
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8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

Second meeting held on 23.08.2021 in online platform

Link of Meeting: https://meet.google.com/uwm-tpwh-zqv

Members Present:

1. Dr. Rajyasri Neogy, Principal
2. Dr. Mrinal Birbanshi , Convener
3. Dr. Prasenjit Das, HOD, Dept. of Microbiology
4. Dr. Avijit Das, HOD, Dept. of Economics
5. Sri Prabir Bhattacharya, HOD, Dept. of Commerce
6. Dr. Samiparna Rakshit, HOD, Dept. of History
7. Dr. Pinaki Chakraborty, HOD, Dept. of Zoology
8. Dr. Sumita Roy, HOD, Dept. of Chemistry
9. Sri Debashis Chaterjee, HOD, Dept. of Physics
10. Ms. Soma Mujumdar, HOD, Dept. of Physiology
11. Dr. Swarnali Sharma, HOD, Dept. of Mathematics
12. Dr. Urmi Roy, HOD, Dept. of Botany
13. Dr. Sweti Roy Chowdhur, Representative Dept. of English
14. Dr. Arnab Banerjee, HOD, Dept. of Journalism & Mass Comm
15. Dr. Ruma Roy, HOD, Dept. of Political Science
16. Dr. Laxmi Saha, HOD, Dept. of Philosophy
17. Dr. Amalendu Mujumdar, HOD, Dept. of Education

Resolution of the meeting

1. The minutes of the previous were read and confirmed by the house
2. Resolved that the admission schedule need to be changed due to the government order for the extension of last date of application from 20th to 27th August. Accordingly, check list of applicants will be published on tentatively 28.8.2021, then final merit list on 30th or 31st after consultation with survive provider.
3. Resolved that all departments are need to design a 30 hour Value Added certificate course for the students. Dr. Arnab Banerjee is proposed as convenor of these courses. Principal is requested to form a committee to look after this matter.
4. Resolved that feedback will be taken from Sixth semester students and part III.
5. Resolved that all departments need to organize student mentoring programs.
6. Meeting ended with vote of thanks by the Principal.

Phone : 033-2412-4082
VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

An online Academic sub committee meeting will be held on Monday 20.9.21 at 6pm.

Agenda:

1. To discuss about the upcoming classes of first semester.

2. To discuss progress and proposal of academic activities during 2021-22 session.

3. Misc.

Link will shared in due course.

Convenor. **Principal**

Phone : 033-2412-4082
VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

Third meeting held on 20.09.2021 in online platform

Link of Meeting: https://meet.google.com/moy-xhzv-gzp

Members Present:

1. Dr. Rajyasri Neogy, Principal
2. Dr. Mrinal Birbanshi , Convener
3. Dr. Prasenjit Das, HOD, Dept. of Microbiology
4. Dr. Avijit Das, HOD, Dept. of Economics
5. Sri Prabir Bhattacharya, HOD, Dept. of Commerce
6. Dr. Samiparna Rakshit, HOD, Dept. of History
7. Dr. Pinaki Chakraborty, HOD, Dept. of Zoology
8. Dr. Sumita Roy, HOD, Dept. of Chemistry
9. Sri Debashis Chaterjee, HOD, Dept. of Physics
10. Ms. Soma Mujumdar, HOD, Dept. of Physiology
11. Dr. Swarnali Sharma, HOD, Dept. of Mathematics
12. Dr. Urmi Roy, HOD, Dept. of Botany
13. Dr. Swati Roy Chowdhur, Representative Dept. of English
14. Dr. Arnab Banerjee, HOD, Dept. of Journalism & Mass Comm
15. Dr. Ruma Roy, HOD, Dept. of Political Science
16. Dr. Laxmi Saha, HOD, Dept. of Philosophy
17. Dr. Amalendu Mujumdar, HOD, Dept. of Education

Resolution of the meeting

The minutes of the previous were read and confirmed by the house

Dr. Rajyasri Neogy, the Principal, took the chair and called the meeting to order via virtual platform (Google meet). The following agenda items were discussed in the meeting:

1. The Principal discussed the issue of commencement of 1st semester classes. She advised to organize an inauguration programme via virtual platform for 1st year students on 4th October, 2021. After that all the departments are advised to take the regular classes of 1st sem as per their routine. The Principal also proposed to provide a notice to the newly admitted 1st year students containing the instructions and contact numbers of the representatives of each department so that they can contact the respective departments and can join the online classes.

2. Next agenda was regarding the correction of the marksheet of the students, for which all the departments are requested to provide the marks in the blank award list for the students (of both

semester system and Part1,2,3 for the exams occurred in online mode) who got “0” or “absent” in their marksheet, by 23rd September, 2021.

3. The Principal also asked every department to provide the details of their departmental activities as well as the activities of their departmental teachers by end of the present month (September, 2021) for the time period June, 2020 to May, 2021 as the college have to submit the AQAR for 20-21 by 31st December.

4. The Principal requested all the departments to introduce Add-on courses with minimum of 30hrs course duration and also to try to organize different types of departmental activities for the students like mentoring programmmes, career counselling programmes, gender awareness programmes etc. for the year 2021-22.

5. The next agenda was regarding formation of Alumni association which is very important for the college. To do this every department are asked to call their pass out students for the years 2019, 2020 and 2021 to the college and make them understand the opportunities of being the member of the alumni association like free access to the college library both in online and offline mode,get help from the teachers for their future and career etc. Also, the departments are requested to fill up the alumni registration form by the students by taking a contribution of Rs.10 from each student, so that the college can get the record of the members of the alumni association and provide them the alumni card with which they can enjoy the facilities of the college. Departments are further asked to request the alumni members to organize some events for the college gradually. Departments are asked to inform those pass out students that the college is going to provide free of cost coaching for the competitive exams for them, for which all the department are requested to share the details of their pass out students with Dr. Swati Roy Choudhury.

6. The Principal requested to make a master routine for this ongoing semester. To do this Dr. Mrinal Birbanshi is requested to take care of the routines of the arts departments and Dr. Urmi Roy is requested to take care of the routines of the science departments.

Meeting ended with vote of thanks by the Principal

Phone : 033-2412-4082
VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

Resolution of the meeting held on 8.11.2021

Members Present:

1. Dr. Rajyasri Neogy, Principal
2. Dr. Mrinal Birbanshi , Convener
3. Dr. Prasenjit Das, HOD, Dept. of Microbiology
4. Dr. Avijit Das, HOD, Dept. of Economics
5. Sri Prabir Bhattacharya, HOD, Dept. of Commerce
6. Dr. Samiparna Rakshit, HOD, Dept. of History
7. Dr. Pinaki Chakraborty, HOD, Dept. of Zoology
8. Dr. Sumita Roy, HOD, Dept. of Chemistry
9. Sri Debashis Chaterjee, HOD, Dept. of Physics
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11. Dr. Swarnali Sharma, HOD, Dept. of Mathematics
12. Dr. Urmi Roy, HOD, Dept. of Botany
13. Dr. Swati Roy Chowdhur, Representative Dept. of English
14. Dr. Arnab Banerjee, HOD, Dept. of Journalism & Mass Comm
15. Dr. Ruma Roy, HOD, Dept. of Political Science
16. Dr. Laxmi Saha, HOD, Dept. of Philosophy
17. Dr. Amalendu Mujumdar, HOD, Dept. of Education

1. The minutes of the previous were read and confirmed by the house
2. As per direction of the Governing Body, based on government order and also as per decision of the academic committee all faculties are informed that offline classes will be resume on and from 16.11.2021.
3. To maintain COVID protocol blended mode of both online and offline mode will be followed presently. All faculties are to attend the college 5 days per week.
4. SOP for resuming offline classes were set up following COVID protocols as per Government order
5. Meeting ended with vote of thanks by the Principal

বিজয়গড় জ্যোতিষ রায় কলেজ

জরুরী নির্দেশাবলী

১. পশ্চিমবঙ্গ সরকার নির্দেশিত কোভিড-১৯ এর আচরণ বিধি সম্পূর্ন রূপে পালন করতে হবে।
২. কোনোভাবেই মাস্ক ছাড়া কলেজ ক্যাম্পাসে প্রবেশ করা যাবে না।
৩. কলেজ কর্তৃপক্ষের নির্ধারিত রীতি ও আদেশ অনুযায়ী ক্লাস রুমে বসতে হবে।
৪. কলেজের ভিতরে ছাত্র-ছাত্রীদের মাস্ক ও স্যানিটাইজার ব্যবহার বাধ্যতামূলক।
৫. কলেজের ভিতরে বা শ্রেনী কক্ষে অকারণে ভিড় বা জটলা করবে না।
৬. হাল্কা সর্দি কাশি জ্বর হলে কলেজে প্রবেশ নিষেধ। এক্ষত্রে নিকটবর্তী স্বাস্থ্যকেন্দ্রে যোগাযোগ করতে হবে।
৭. করোনার টীকা গ্রহণ (Vaccine) না থাকলে কলেজে প্রবেশ করা যাবে না।
৮. করোনা সংক্রান্ত কোনা গুজব ছড়ালে কলেজ কর্তৃপক্ষ কঠোর ব্যবস্থা গ্রহণ করবে।
৯. আতঙ্কে নয় আমাদের সর্বক্ষণ সচেতন থাকতে হবে।
১০. করোনার সমস্ত বিধি নিষেধ পালন করে কলেজকে সহযোগিতার হাত বাড়িয়ে দিতে হবে।

অধ্যক্ষা, বিজয়গড় জ্যোতিষ রায় কলেজ

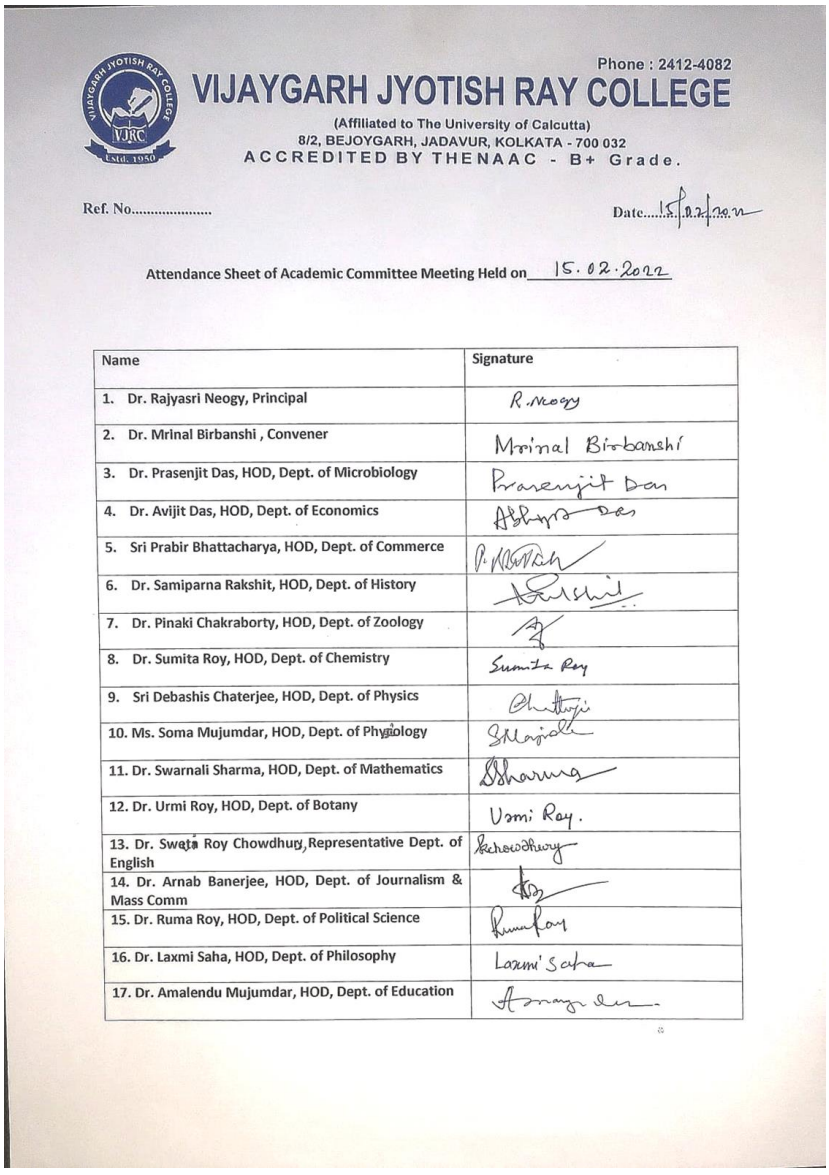
Phone : 033-2412-4082
VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

Agenda

1. To discuss matters regarding commencement of offline classes for 4th Semester and 6th Semester for the period February till the date of examination announced by the University.
2. Miscellaneous

Members Present:



Phone : 2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVUR, KOLKATA - 700 032
ACCREDITED BY THENAAC - B+ Grade.

Ref. No.....

Date.....15.02.2022

Attendance Sheet of Academic Committee Meeting Held on 15.02.2022

Name	Signature
1. Dr. Rajyasri Neogy, Principal	R.Neogy
2. Dr. Mrinal Birbanshi , Convener	Mrinal Birbanshi
3. Dr. Prasenjit Das, HOD, Dept. of Microbiology	Prasenjit Das
4. Dr. Avijit Das, HOD, Dept. of Economics	
5. Sri Prabir Bhattacharya, HOD, Dept. of Commerce	
6. Dr. Samiparna Rakshit, HOD, Dept. of History	
7. Dr. Pinaki Chakraborty, HOD, Dept. of Zoology	
8. Dr. Sumita Roy, HOD, Dept. of Chemistry	Sumita Roy
9. Sri Debashis Chaterjee, HOD, Dept. of Physics	
10. Ms. Soma Mujumdar, HOD, Dept. of Physiology	
11. Dr. Swarnali Sharma, HOD, Dept. of Mathematics	
12. Dr. Urmi Roy, HOD, Dept. of Botany	Urmi Roy.
13. Dr. Swati Roy Chowdhury, Representative Dept. of English	
14. Dr. Arnab Banerjee, HOD, Dept. of Journalism & Mass Comm	
15. Dr. Ruma Roy, HOD, Dept. of Political Science	
16. Dr. Laxmi Saha, HOD, Dept. of Philosophy	Laxmi Saha
17. Dr. Amalendu Mujumdar, HOD, Dept. of Education	

Resolution of the meeting held on 15.02.2022

1. The minutes of the previous meeting were read and confirmed by the house

2. After thorough discussion about the commencement of classes for 4th and 6th Semester, it was resolved that a routine would be prepared keeping in mind the COVID protocols and requirements.

3. Representative members from different departments were requested by convenor and Principal to prepare a departmental routine and sent it to routine committee, the later would be responsible for preparation of final routine.

4. Convener requested all members to follow the academic calendar for successful completion of the semester syllabus

5. It was resolved that matters regarding upcoming internal and tutorial examination of 1st Semester examination would be discussed among departmental faculty members and would be schedules as per convenience of the department maintaining strict COVID protocol

6. Principal asked all members to review the teaching learning methodologies followed in their respective departments and explore the possibility of applying innovative teaching-learning methodologies. Members were also requested to inform departmental faculty members to upload e-contents in college web-portal.

7. Principal requested the members to carry out feedback survey from the students at their respective departments

8. Principal also requested the members of the committee to take initiative at their respective departments to publish wall magazine, organize students seminars, lecture series, add on courses, excursions, industry visits and extension activities. All members agreed that such initiative would contribute to holistic development of the students.

Meeting ended with vote of thanks by the Principal

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VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

Agenda

1. Upcoming classes
2. Upcoming admission
3. Upcoming preparations for NAAC.
4. Upcoming academic activities other than classes.
5. Miscellaneous.

Members Present

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VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVUR, KOLKATA - 700 032
ACCREDITED BY THENAAC - B+ Grade.

Ref. No..... Date....19.8.22...

Attendance Sheet of Academic Committee Meeting Held on 10.08.2022

Name	Signature
1. Dr. Rajyasri Neogy, Principal	R. neogy
2. Dr. Mrinal Birbanshi , Convener	Mrinal Birbanshi
3. Dr. Prasenjit Das, HOD, Dept. of Microbiology	Prasenjit Das
4. Dr. Avijit Das, HOD, Dept. of Economics	Abhijit Das
5. Sri Prabir Bhattacharya, HOD, Dept. of Commerce	
6. Dr. Samiparna Rakshit, HOD, Dept. of History	
7. Dr. Pinaki Chakraborty, HOD, Dept. of Zoology	
8. Dr. Sumita Roy, HOD, Dept. of Chemistry	ab
9. Sri Debashis Chaterjee, HOD, Dept. of Physics	
10. Ms. Soma Mujumdar, HOD, Dept. of Physiology	
11. Dr. Swarnali Sharma, HOD, Dept. of Mathematics	
12. Dr. Urmi Roy, HOD, Dept. of Botany	ab
13. Dr. Swati Roy Chowdhury, Representative Dept. of English	
14. Dr. Arnab Banerjee, HOD, Dept. of Journalism & Mass Comm	
15. Dr. Ruma Roy, HOD, Dept. of Political Science	
16. Dr. Laxmi Saha, HOD, Dept. of Philosophy	Laxmi Saha
17. Dr. Amalendu Mujumdar, HOD, Dept. of Education	

Resolution of the meeting held on 10.08.2022

1. The minutes of the previous meeting were read and confirmed by the house

2. Members of the committee discussed about fixing dates for commencement of classes for 3rd and 5th Semester. It was resolved that classes for the above two semester would commence from 16.08.2022

3. Representative members from different departments were requested to prepare an academic plan as per following format:

   i. Name of the department
   ii. Name of the teacher
   iii. No.of classes allotted for sixth semester both offline and online
   iv. No of classes taken for sixth semester both offline and online with document.
   v. Topic of the syllabus of sixth semester allotted for the teacher
   vi. Topic of the syllabus allotted covered by the teacher.
   vii. Requirement of the offline classes if any.
   viii. Any other information.

4. Convener requested all members to follow the academic calendar for successful completion of the semester syllabus

5. Members requested the routine committee to set up routine for the forthcoming semesters at the earliest

6. Members discussed about various aspects of admission for the new session 2022-23 and resolved to stage an admission committee meeting at the earliest.

7. Principal requested the members to organize departmental records and provide the same to IQAC members as per requirement for preparation of AQAR and Self Study Report (SSR) for NAAC validation

8. Principal also requested the members of the committee to organize seminars, excursions, industry visits and extension activities for value added enhancement of the students.

Meeting ended with vote of thanks by the Principal

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Ref. No: **Date:**

Report of Examination Committiee meetings held for the session 2021-22

Phone : 033-2412-4082
VIJAYGARH JYOTISH RAY COLLEGE
(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032

Ref. No: **Date:**

Meeting held on 10.01.2022 in online platform

Agenda of the meeting:

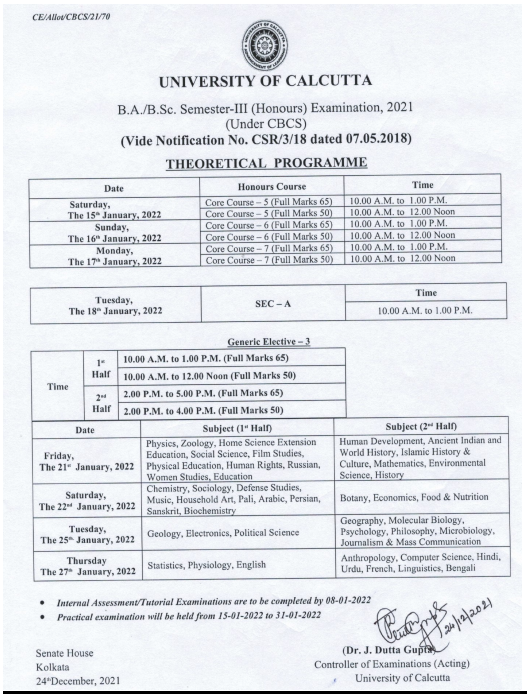
1. To discuss matters regarding theoretical and practical examinations of 3rd and 5th Semester Courses
2. To discuss matters regarding upload of internal and tutorial examinations of 3rd and 5th Semester in University portal
3. Miscellaneous

Link of Meeting: https://meet.google.com/xcn-eknr-zmm

Resolutions of the meeting

1. The minutes of the previous were read and confirmed by the house

2. It was resolved that theoretical examinations for 3rd and 5th semester would begin from 15th January as per notification published by University and representative members from the departments are requested to discuss among the faculty members of the department regarding modus operandi of carrying out the examination in online mode



CE/Allot/CBCS/21/70

UNIVERSITY OF CALCUTTA

B.A./B.Sc. Semester-III (Honours) Examination, 2021
(Under CBCS)
(Vide Notification No. CSR/3/18 dated 07.05.2018)

THEORETICAL PROGRAMME

Date	Honours Course	Time
Saturday, The 15th January, 2022	Core Course – 5 (Full Marks 65)	10.00 A.M. to 1.00 P.M.
	Core Course – 5 (Full Marks 50)	10.00 A.M. to 12.00 Noon
Sunday, The 16th January, 2022	Core Course – 6 (Full Marks 65)	10.00 A.M. to 1.00 P.M.
	Core Course – 6 (Full Marks 50)	10.00 A.M. to 12.00 Noon
Monday, The 17th January, 2022	Core Course – 7 (Full Marks 65)	10.00 A.M. to 1.00 P.M.
	Core Course – 7 (Full Marks 50)	10.00 A.M. to 12.00 Noon

Tuesday, The 18th January, 2022	SEC – A	Time
		10.00 A.M. to 1.00 P.M.

Generic Elective – 3

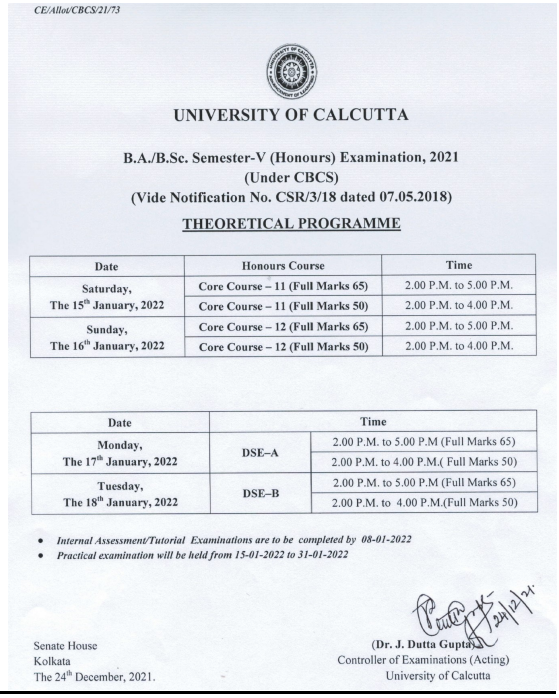
Time		
	1st Half	10.00 A.M. to 1.00 P.M. (Full Marks 65)
		10.00 A.M. to 12.00 Noon (Full Marks 50)
	2nd Half	2.00 P.M. to 5.00 P.M. (Full Marks 65)
		2.00 P.M. to 4.00 P.M. (Full Marks 50)

Date	Subject (1st Half)	Subject (2nd Half)
Friday, The 21st January, 2022	Physics, Zoology, Home Science Extension Education, Social Science, Film Studies, Physical Education, Human Rights, Russian, Women Studies, Education	Human Development, Ancient Indian and World History, Islamic History & Culture, Mathematics, Environmental Science, History
Saturday, The 22nd January, 2022	Chemistry, Sociology, Defense Studies, Music, Household Art, Pali, Arabic, Persian, Sanskrit, Biochemistry	Botany, Economics, Food & Nutrition
Tuesday, The 25th January, 2022	Geology, Electronics, Political Science	Geography, Molecular Biology, Psychology, Philosophy, Microbiology, Journalism & Mass Communication
Thursday The 27th January, 2022	Statistics, Physiology, English	Anthropology, Computer Science, Hindi, Urdu, French, Linguistics, Bengali

- *Internal Assessment/Tutorial Examinations are to be completed by 08-01-2022*
- *Practical examination will be held from 15-01-2022 to 31-01-2022*

Senate House
Kolkata
24thDecember, 2021

(Dr. J. Dutta Gupta)
Controller of Examinations (Acting)
University of Calcutta



CE/Allot/CBCS/21/73

UNIVERSITY OF CALCUTTA

B.A./B.Sc. Semester-V (Honours) Examination, 2021
(Under CBCS)
(Vide Notification No. CSR/3/18 dated 07.05.2018)

THEORETICAL PROGRAMME

Date	Honours Course	Time
Saturday, The 15th January, 2022	Core Course – 11 (Full Marks 65)	2.00 P.M. to 5.00 P.M.
	Core Course – 11 (Full Marks 50)	2.00 P.M. to 4.00 P.M.
Sunday, The 16th January, 2022	Core Course – 12 (Full Marks 65)	2.00 P.M. to 5.00 P.M.
	Core Course – 12 (Full Marks 50)	2.00 P.M. to 4.00 P.M.

Date		Time
Monday, The 17th January, 2022	DSE–A	2.00 P.M. to 5.00 P.M (Full Marks 65)
		2.00 P.M. to 4.00 P.M.(Full Marks 50)
Tuesday, The 18th January, 2022	DSE–B	2.00 P.M. to 5.00 P.M (Full Marks 65)
		2.00 P.M. to 4.00 P.M.(Full Marks 50)

- *Internal Assessment/Tutorial Examinations are to be completed by 08-01-2022*
- *Practical examination will be held from 15-01-2022 to 31-01-2022*

Senate House
Kolkata
The 24th December, 2021.

(Dr. J. Dutta Gupta)
Controller of Examinations (Acting)
University of Calcutta

3. It was resolved that like previous semester examinations, examinees will have the provision of submitting their answerscripts both in online and offline mode.

4. It was resolved that every department would create an email address of their own for receipt of answerscripts. Question papers would be made available in college website befor 15 minutes of commencement of examinations. As a backup plan, questions would be made available to the department from where students also can get access to the questions.

5. Representative members of the department were also requested to upload internal, tutorial (or practicals) as well as theoretical marks in University portal within stipulated time as fixed by affiliating University

UNIVERSITY OF CALCUTTA

Notice

CE/RMCC/25/22 Date :14-01-2022

It is notified that date schedule for on-line submission of marks for B.A./B.Sc./B.Com.Semester-III/V(Honours/General/Major)Examinations,2021(UnderCBCS)and B.A./B.Sc./B.Com.Part-I/II (Honours/General/Major) Examinations,2021(Under 1+1+1 System) will be as per the following schedule:

Examination	Marks component	Date of commencement
B.A./B.Sc./B.Com.Semester-III/V(Honours/General/Major)Examinations,2021 (Under CBCS)	Internal /Tutorial (IA/TU) Steps: Online Entry…..Confirmation….. Verification…… Generation of marks statement.	17-01-2022
B.A./B.Sc./B.Com.Semester-III/V(Honours/General/Major)Examinations,2021 (Under CBCS) & B.A./B.Sc./B.Com.Part-I/II (Honours/General/Major) Examinations,2021(Under 1+1+1 System)	Practical/Project /Theoretical (PR/TH) Steps: Online Entry…..Confirmation….. Verification……Scrutiny… Generation of marks statement.	17-01-2022

There will be no provision to change IA/TU marks after on line verification and PR/TH marks after on line scrutiny.

Kindly arrange to generate from the marks entry portal ' marks entry status/summary status' to check marks entry position and 'Incomplete summary PDF / Incomplete details PDF to obtain foil numbers/roll numbers for pending marks submission(if any).

Kind cooperation is solicited for smooth functioning of the marks entry system and publication of examination results within stipulated time period.

Regards ,

(Dr.Jayeeta Dutta Gupta)

Controller of Examinations (Acting)

University of Calcutta

6. The meeting ended with vote of thanks by the convener.

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Ref. No: **Date:**

Meeting held on 21.01.2022 in online platform

Agenda of the meeting:

1. To discuss matters regarding internal and tutorial examinations of 1st Semester Courses
2. To discuss matters regarding the forthcoming theoretical examinations of 1st Semester Courses
3. Miscellaneous

Link of Meeting: https://meet.google.com/rvb-izzv-uyw

Resolution of the meeting

1. The minutes of the previous were read and confirmed by the house
2. Resolved that the internal examination of Semester I courses would be taken online through google form based responses or through mail between 4/2/2022 and 12/02/2022 and numbers would be uploaded in stipulated time as when notified by university.
3. It was also resolved that all departments would make necessary arrangement for taking online theoretical examinations as and when notified by affiliating University, and subsequently upload marks in University portal in stipulated time as will be notified by university.
4. The meeting ended with vote of thanks by the convener.

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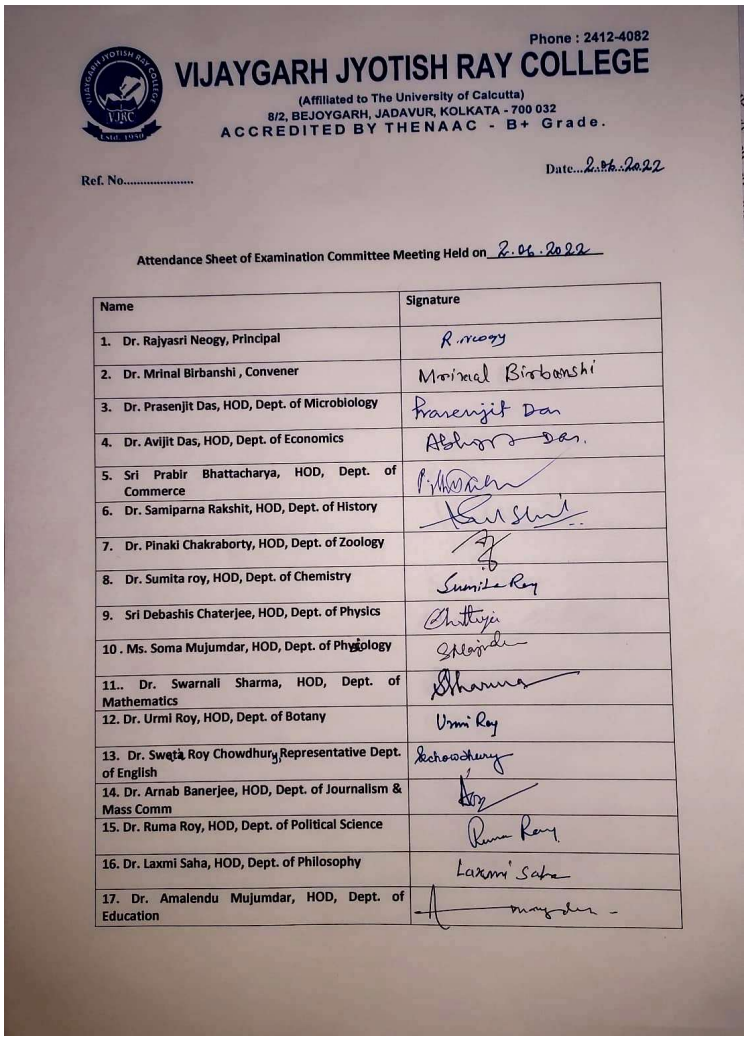
Ref. No: **Date:**

Meeting held on 2.06.2022, Thursday, 12.00 noon at Principal's Chamber.

Agenda

1. To fix up dates of Internal and Tutorial examinations for and 6th Semester courses
2. To discuss matters regarding 6th Semester Theoretical and Practical examinations in offline mode
3. Miscellaneous

Members Present:



Phone : 2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to The University of Calcutta)
8/2, BEJOYGARH, JADAVUR, KOLKATA - 700 032
ACCREDITED BY THENAAC - B+ Grade.

Ref. No.....

Date...2.06.2022

Attendance Sheet of Examination Committee Meeting Held on 2.06.2022

Name	Signature
1. Dr. Rajyasri Neogy, Principal	R. Neogy
2. Dr. Mrinal Birbanshi , Convener	Mrinal Birbanshi
3. Dr. Prasenjit Das, HOD, Dept. of Microbiology	Prasenjit Das
4. Dr. Avijit Das, HOD, Dept. of Economics	Abhijit Das.
5. Sri Prabir Bhattacharya, HOD, Dept. of Commerce	
6. Dr. Samiparna Rakshit, HOD, Dept. of History	
7. Dr. Pinaki Chakraborty, HOD, Dept. of Zoology	
8. Dr. Sumita roy, HOD, Dept. of Chemistry	Sumita Roy
9. Sri Debashis Chaterjee, HOD, Dept. of Physics	
10 . Ms. Soma Mujumdar, HOD, Dept. of Physiology	
11.. Dr. Swarnali Sharma, HOD, Dept. of Mathematics	
12. Dr. Urmi Roy, HOD, Dept. of Botany	Urmi Roy
13. Dr. Sweta Roy Chowdhury Representative Dept. of English	
14. Dr. Arnab Banerjee, HOD, Dept. of Journalism & Mass Comm	
15. Dr. Ruma Roy, HOD, Dept. of Political Science	
16. Dr. Laxmi Saha, HOD, Dept. of Philosophy	Laxmi Saha
17. Dr. Amalendu Mujumdar, HOD, Dept. of Education	

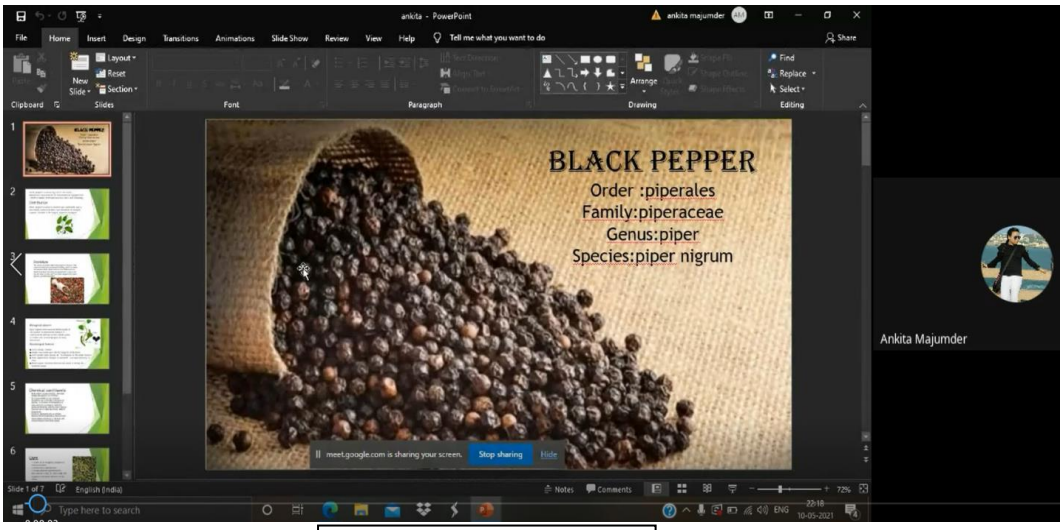
Resolution of the meeting held on 2.06.2022

1. The minutes of the previous were read and confirmed by the house
2. As per notifications by University, dates for internal examination for 6th semester courses were discussed upon and was resolved to be scheduled between 15.06.2022-20.06.2022.
3. All members were requested to inform their respective departments to upload marks in University portal in stipulated time as would be notified by University.
4. Possibility of offline mode in forthcoming examinations was discussed and all the departments were asked to make necessary preparations in this regard.
5. It was resolved that as per discussed in the meeting of Academic committee and as per requirement of the upcoming sixth semester exam, all are requested to prepare a according to following format:

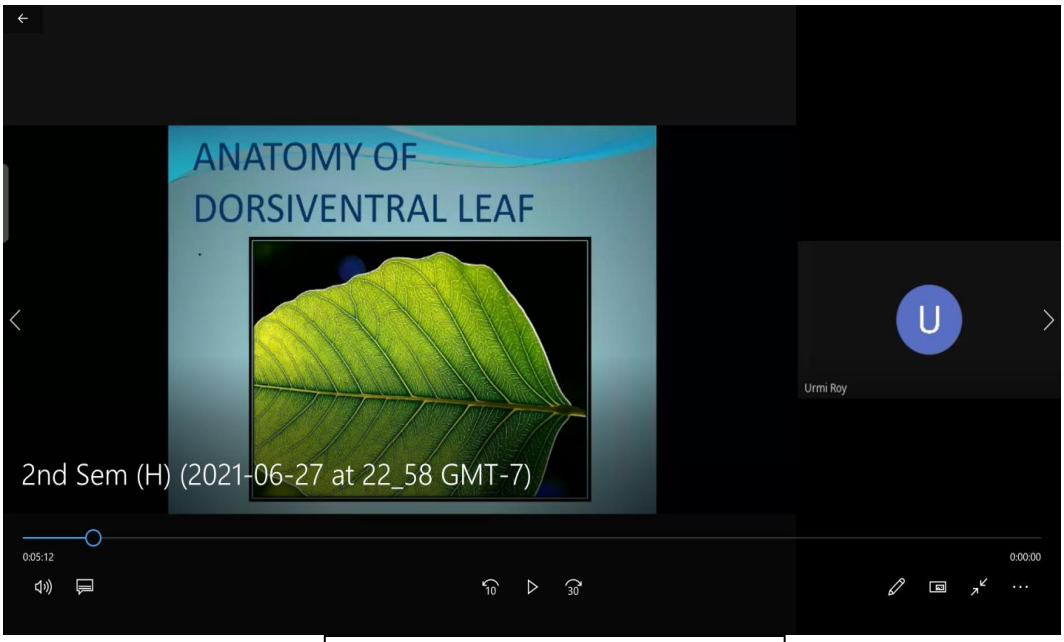
    1. Name of the department
    2. Name of the teacher
    3. No.of classes allotted for sixth semester both offline and online
    4. No of classes taken for sixth semester both offline and online with document.
    5. Topic of the syllabus of sixth semester allotted for the teacher
    6. Topic of the syllabus allotted covered by the teacher.
    7. Requirement of the offline classes if any.
    8. Any other information.

6. Meeting ended with vote of thanks by the Principal

Student Seminar, Debate, Quiz



Dept. of Botany: 5th Oct.

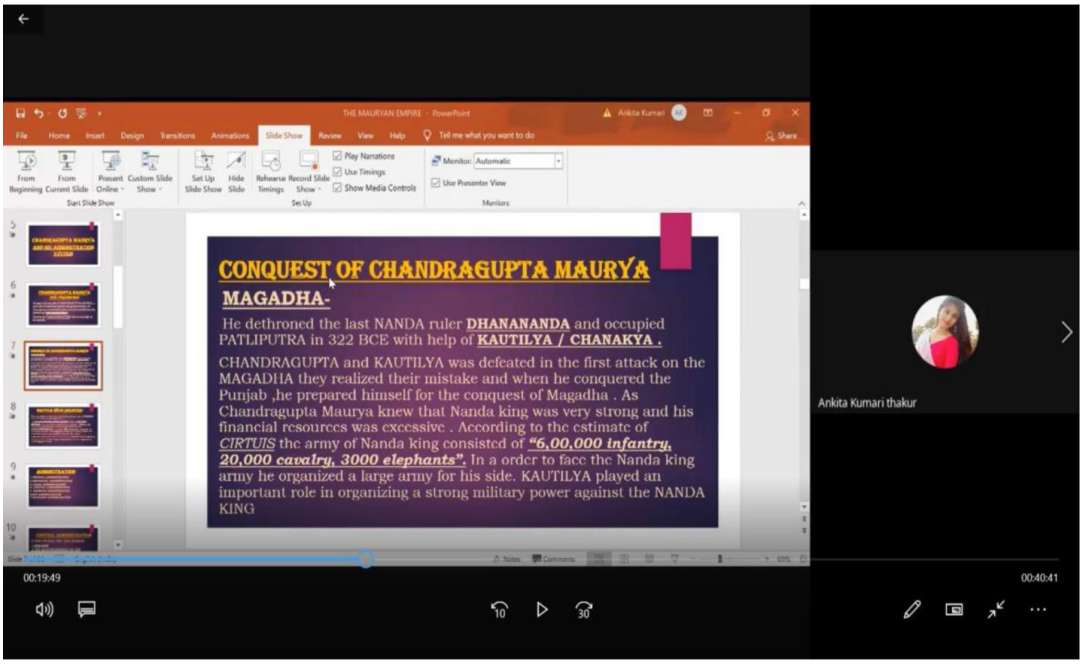


Dept. of Botany: 27th June 2021.

Department of Bengali, VJRC has organized a student

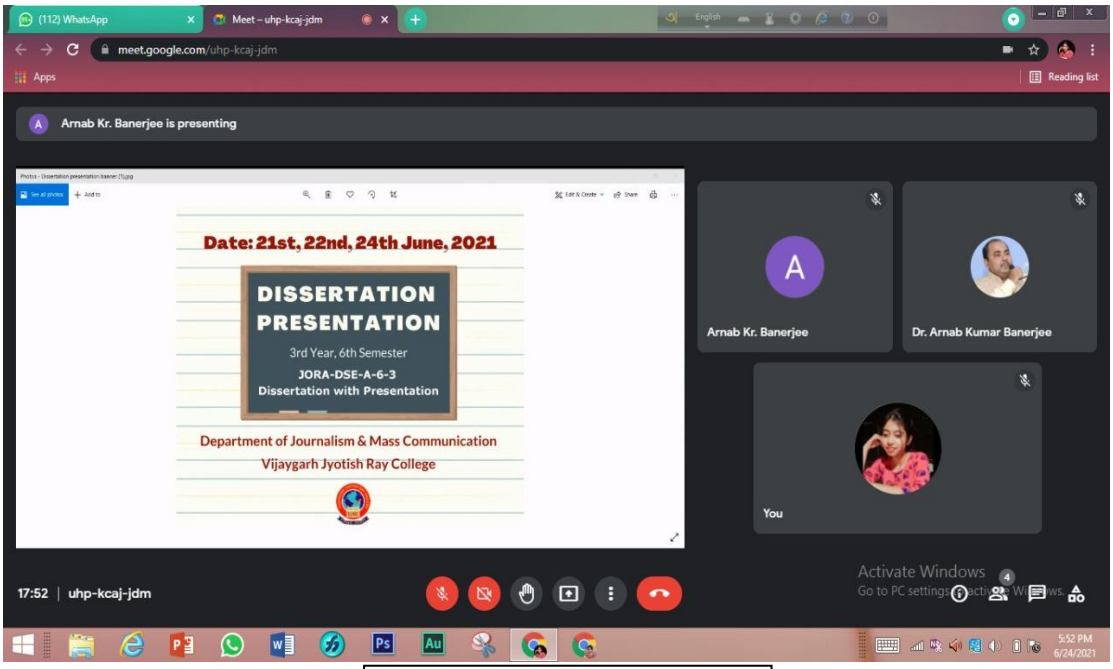
The Department of Chemistry organized a Students' Seminar on 07.10.2021

Online Peer Teaching Programme by Dept. of

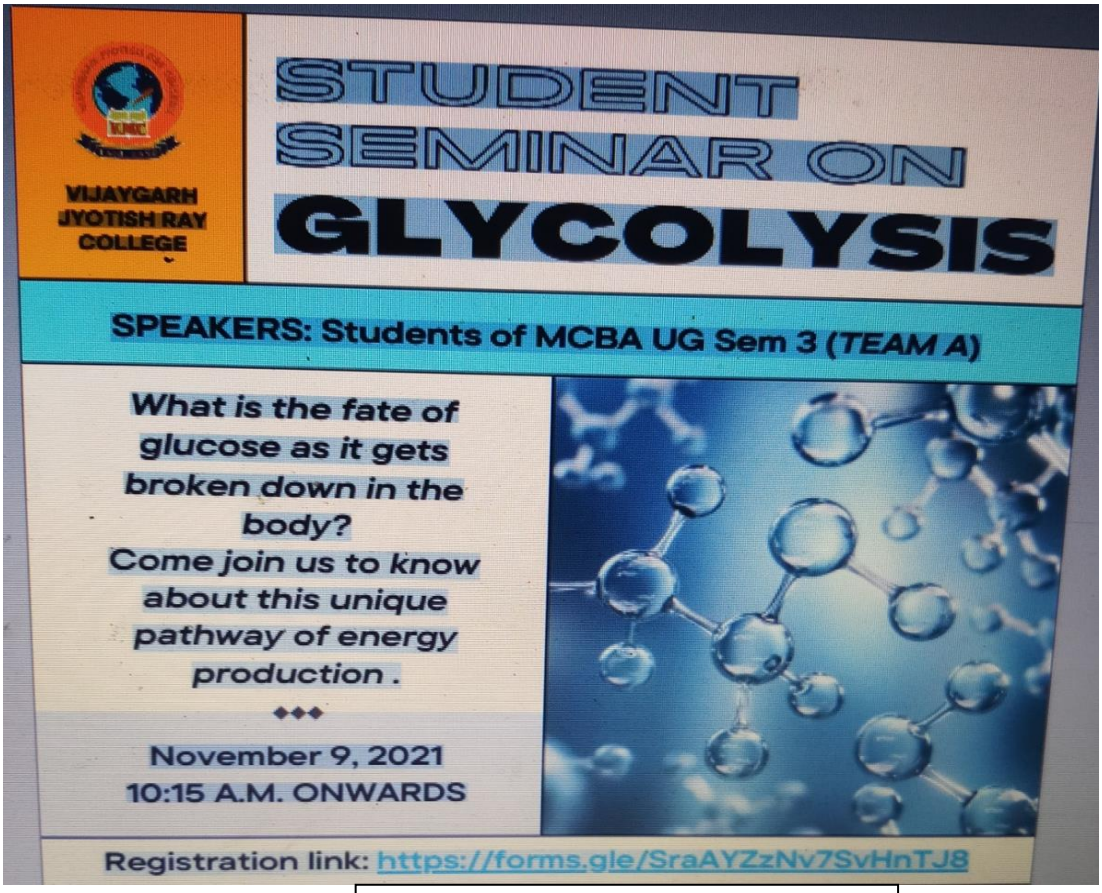


Student Presentation by the Dept. of History on 24th June 2021

Student Presentation by the Dept. of History on 9th July 2021

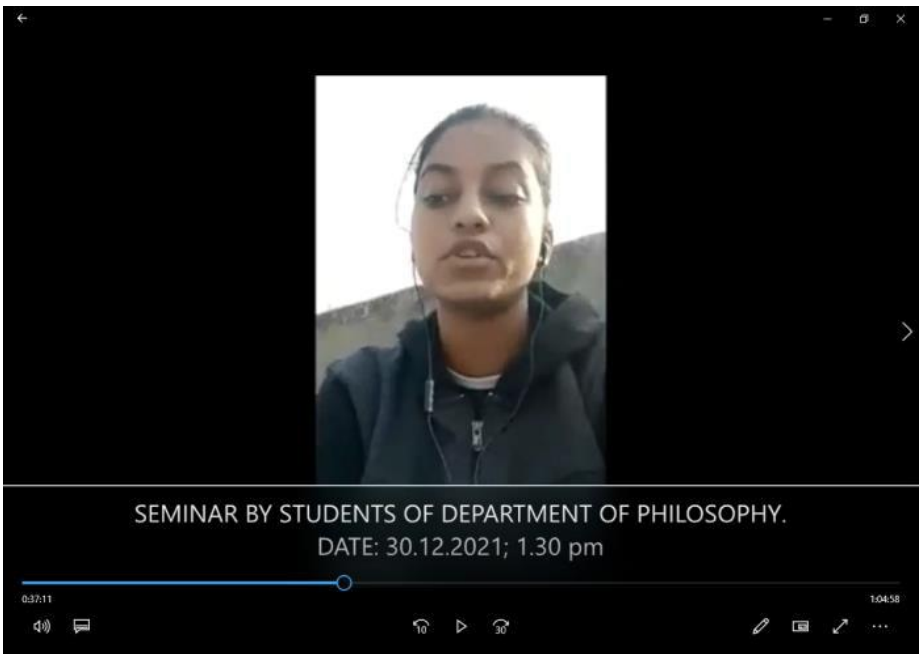


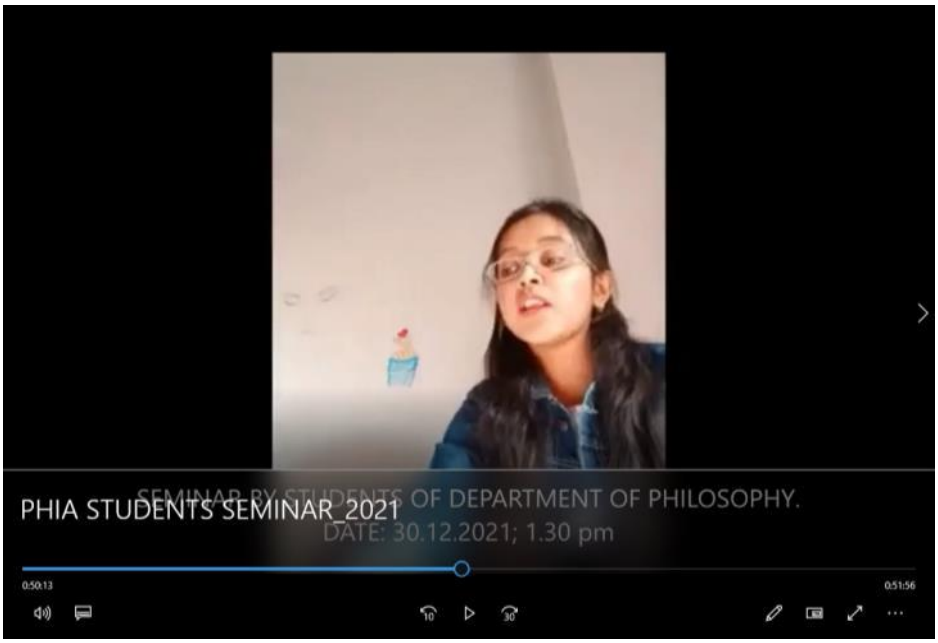
Dept. of Journalism: June



Dept. of Microbiology: 9th Nov. 2021.

Picture of Students Presentation
Dept of Philosophy

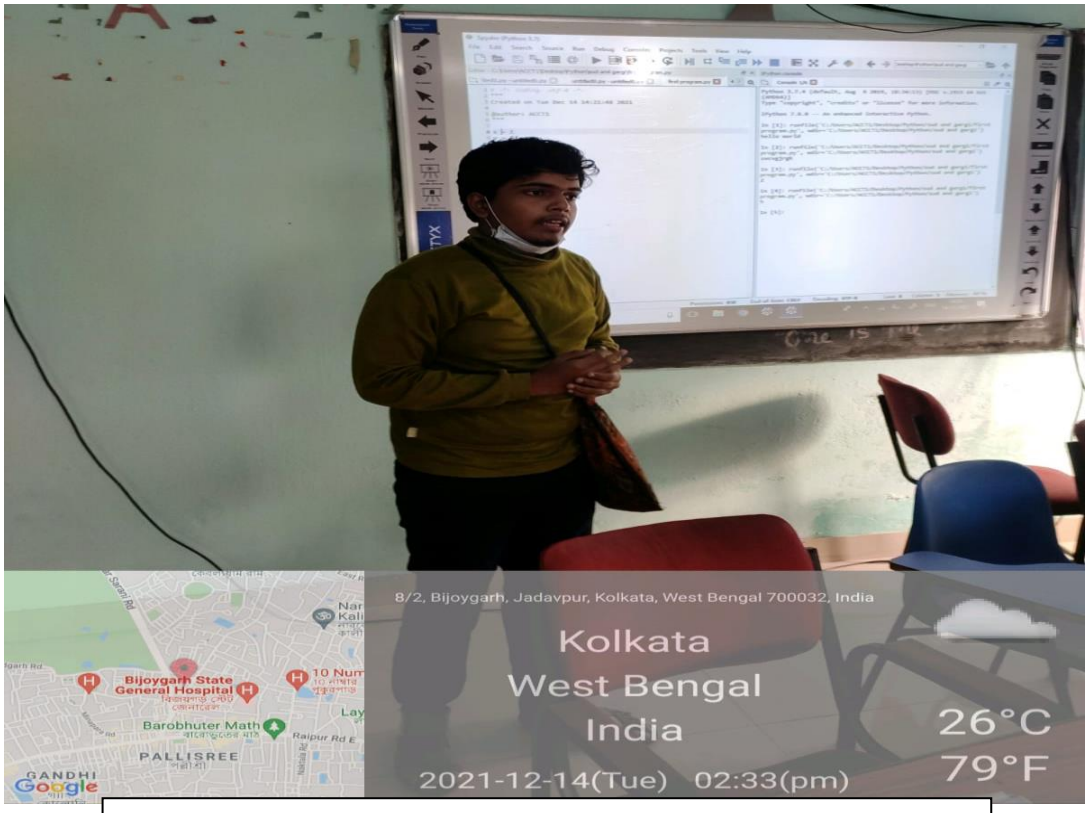




Link for recorded session of the above event:

https://drive.google.com/file/d/12fVl2-liGNV4oM26BRvVfHYs7poC6ARa/view?usp=sharing

The Department of Physics has organized a Students' Seminar on 25th June, 2021



The Department of Physics has organized a Students' Seminar on 14th December, 2021

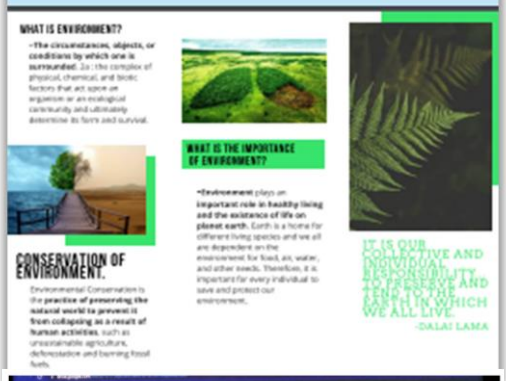
The Department of Physics has organized a Students' Seminar on Date-27.12.2021

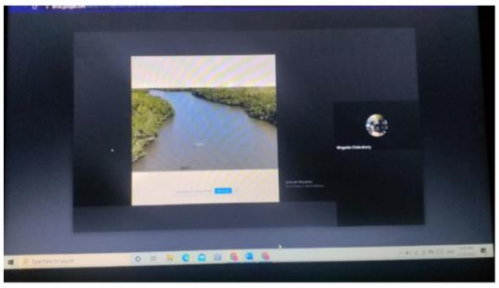

8/2, Bijoygarh, Jadavpur, Kolkata, West Bengal 700032, India
Kolkata
West Bengal
India
2021-12-27(Mon) 03:48(pm)
25°C
77°F

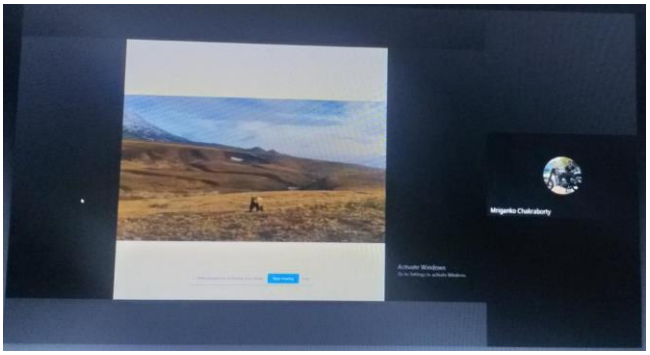

8/2, Bijoygarh, Jadavpur, Kolkata, West Bengal 700032, India
Kolkata
West Bengal
India
2021-12-27(Mon) 03:24(pm)
26°C
79°F


8/2, Bijoygarh, Jadavpur, Kolkata, West Bengal 700032, India
Kolkata
West Bengal
India
2021-12-27(Mon) 03:22(pm)
26°C
79°F

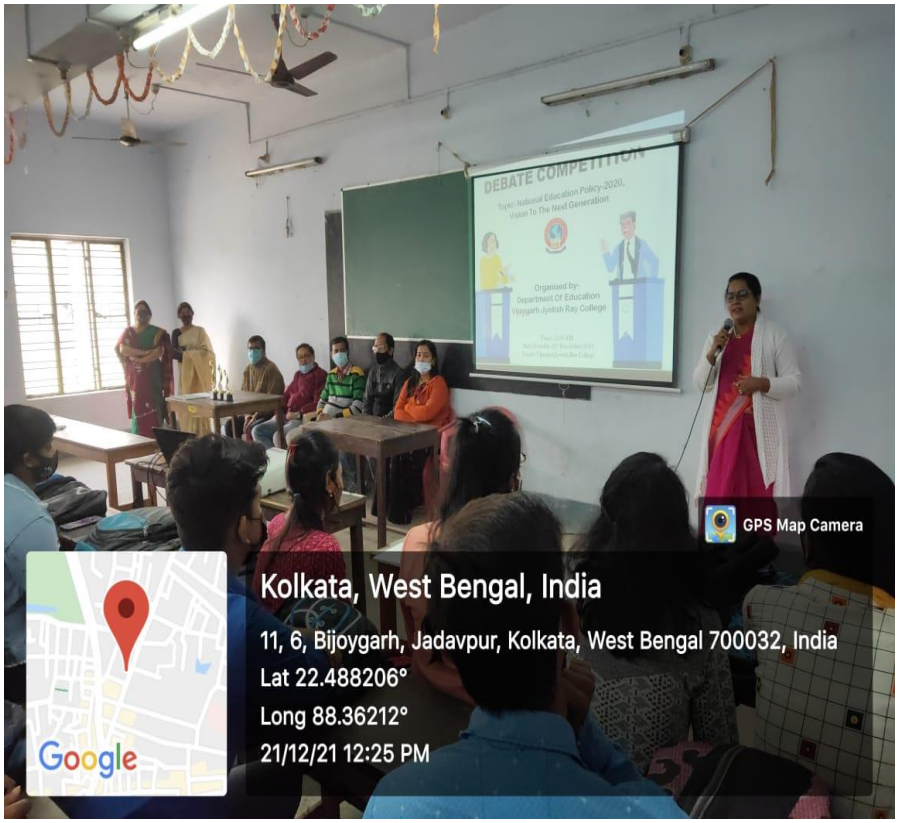
The Department of Political Science organized a Students' Seminar on 28th June, 2021



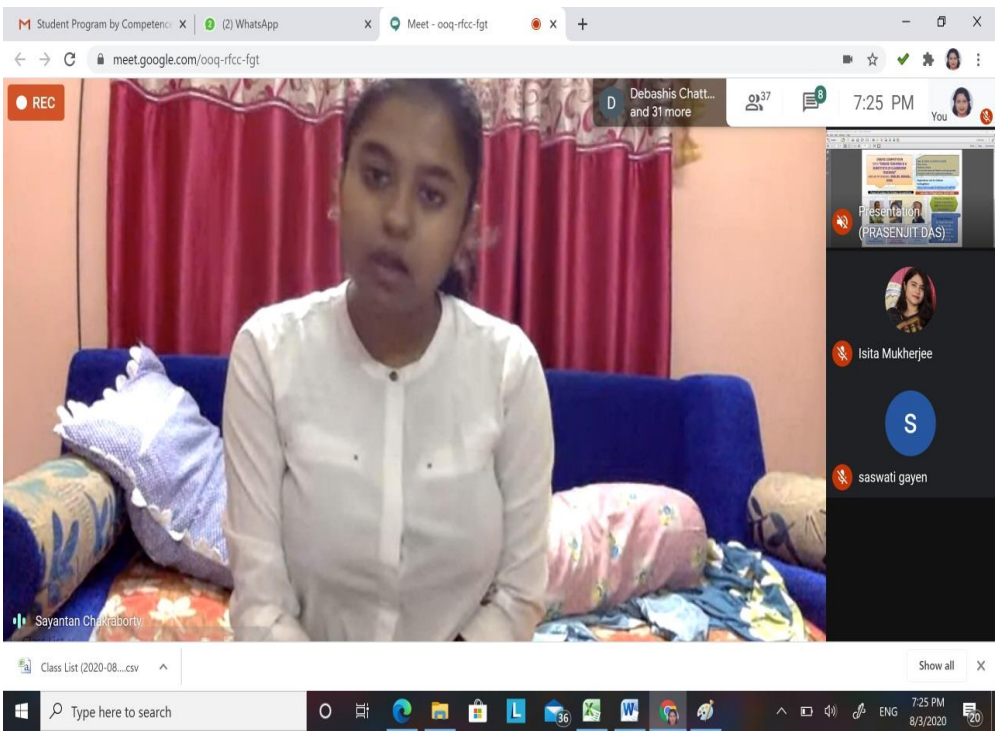




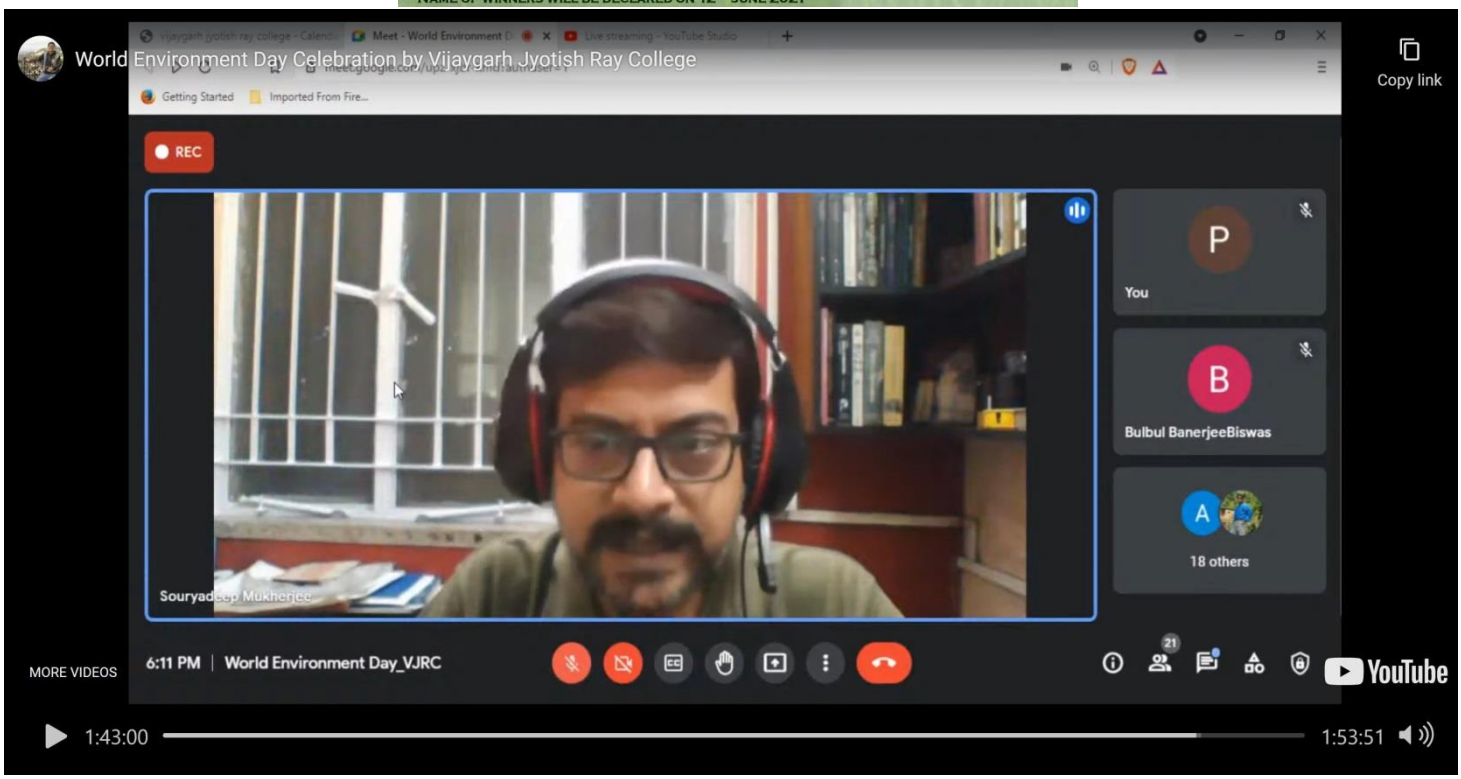
An Intra-College Debate Competition was organized by Dept. of Education, VJRC on the topic: "New Education Policy 2020 - A Vision to the Next Generation" on 21.12.2021



An Inter-College Essay Writing and Debate Competition was organized by Competence Building Cell & IQAC, VJRC from 03.08.2020 to 05.08.2020 on "Online Teaching is a Substitute of

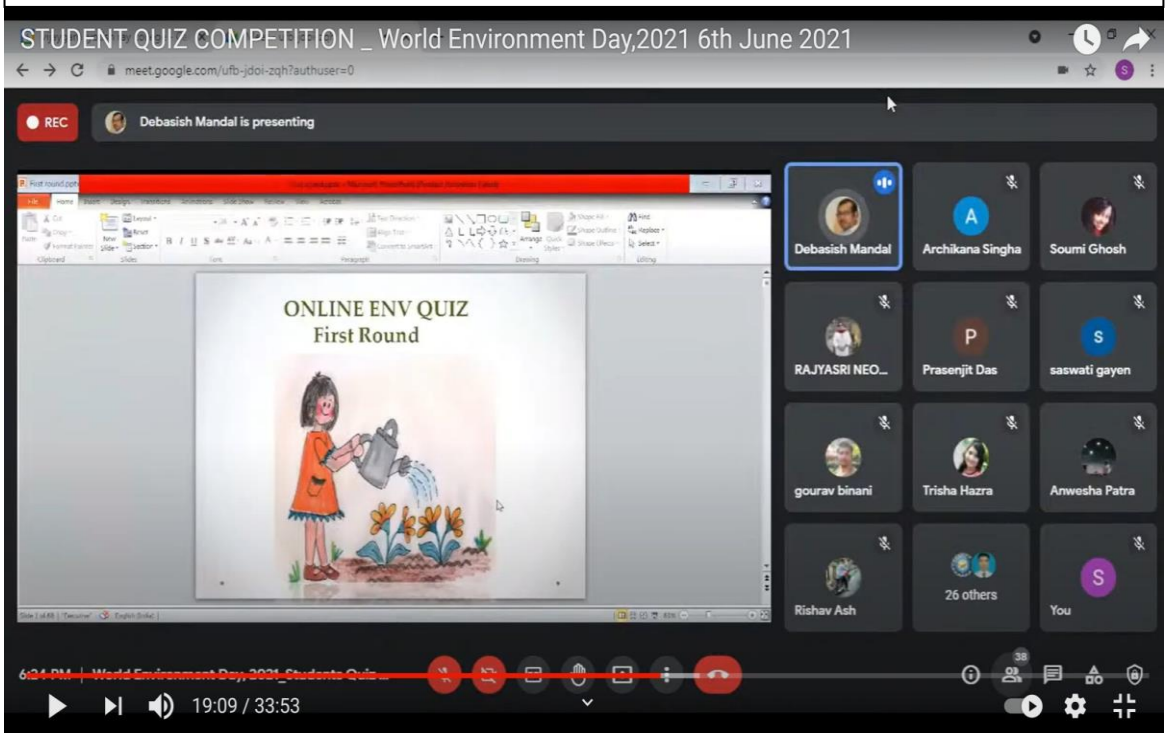


Dept. of Botany, Dept. of Microbiology,Research & Guidance Cell & IQAC in collaboration with Science Association of Bengal, organized Student Develop. Programme (5th-June 2021), through debate competition

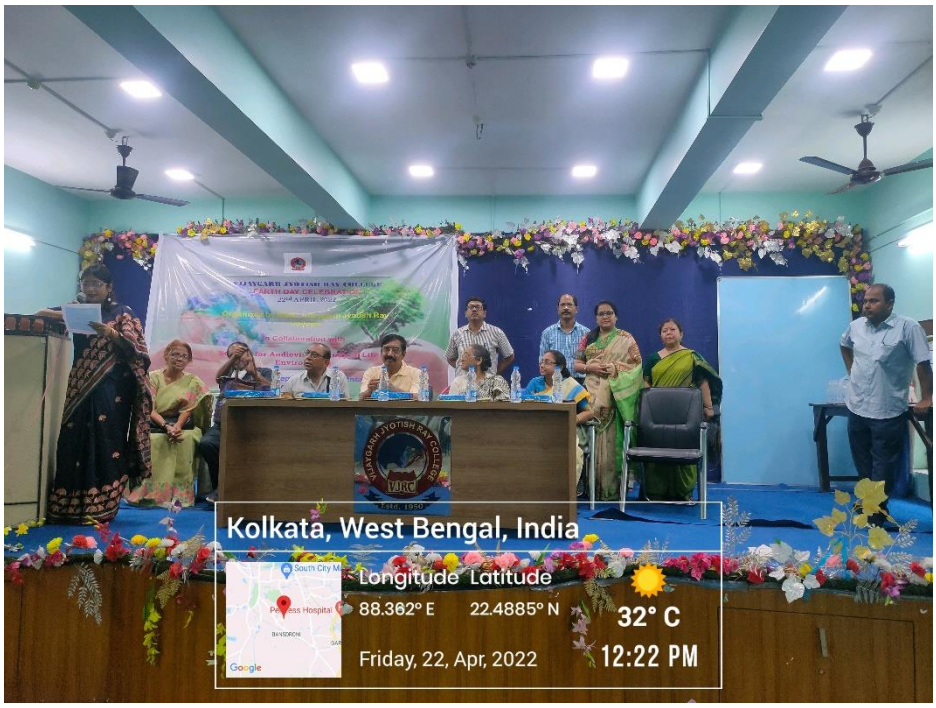


The Department of Political science, VJRC, has organized a debate competition on 26th November 2021, among the students of political science. on the topic was "The PREAMBLE"

Quiz competition was held on the celebration of the World Environment Dayon 6th June 2021 by Dept. of Environmental Science, Dept. of Botany, Dept. of Microbiology,Research & Guidance Cell & IQAC in collaboration with Science Association of Bengal



Inter-College poster competition on the occasion of Earth Day on 22nd April, 2022 organised by IQAC, Vijaygarh Jyotish Ray College



Inter-College Quiz Competetion on the occasion of Environment Day on 6th June, 2022 organised by IQAC, Vijaygarh Jyotish Ray College

Sample of Workshop/FDP/Seminar for Faculties

Vijaygarh Jyotish Ray College

Department of Economics
&
Department of Journalism & Mass Communication
&
Internal Quality Assurance Cell

In collaboration with

Research & Guidance Cell

Invites you all

One-Day Workshop

On

"Research Methodology"

(Offline Mode)

Speaker:-

Dr. Shyamasree Dasgupta

Associate Professor
School of Humanities & Social Sciences
Indian Institute of Technology Mandi

Organizing Committee-

- **Chief Patron:** Dr. Rajyasri Neogy (Principal)
- **IQAC Coordinators:** Dr. Sampa Debnath & Dr. Prasenjit Das
- **Conveners:** Dr. Abhijit Das & Dr. Arnab Kumar Banerjee
- **Co-Conveners:** Dr. Isita Mukherjee & Dr. Shilajit Barua

For more Information:
6289093179
9433449642

Date: *29.12.2021*
Time: *1.00 p.m.*

Venue: Virtual Classroom, 2nd Floor, Vijaygarh Jyotish Ray College

Registration Link: https://forms.gle/pEaBUjFzeGvqiGsY8

Workshop

on

"Understanding of Qualitative and Quantitative Metrics in the Evaluation by NAAC"

Organized By

Internal Quality Assurance Cell (IQAC)

Vijaygarh Jyotish Ray College, Kolkata

Speaker: Dr. Manas Kumar Baidya

Principal

Malda College, WB, India

Date: 6.12.2021

Time: 11 am

Venue: Vijaygarh Jyotish Ray College, Kolkata

Faculty Development Program on

ICT Empowerment

Time: 11.00 AM
Date: 3 & 4 March, 2022

Organized By IQAC
Supported by IT Cell
Vijaygarh Jyotish Ray College

Training Assistance:
EBLUESIS

https://forms.gle/PoMTceKbbr6z9T5v7
Register Yourself

Venue: Acharya Satyendranath Bose Virtual Classoom

VIJAYGARH JYOTISH RAY COLLEGE

8/2, Bejoygarh, Jadavpur, Kolkata-700032

SEMINAR ON

"NAAC, HEIs and NEP 2020: CURRENT PERSPECTIVES"

Organized by

IQAC, VIJAYGARH JYOTISH RAY COLLEGE

SPEAKER

DR. TUSHAR KANTI GHARA

STATE NODAL OFFICER, AISHE

JDPI, DEPARTMENT OF HIGHER EDUCATION,

GOVERNMENT OF WEST BENGAL

May 6, 2022

Friday

3:00 PM

Dr. Rajyasri Neogy
Principal
Vijaygarh Jyotish Ray College

Dr. Prasenjit Das
IQAC Coordinator
Vijaygarh Jyotish Ray College

ONE DAY INTERNATIONAL SEMINAR ON:

RECENT TRENDS IN MICROBIOLOGY

ORGANISED BY DEPARTMENT OF MICROBIOLOGY, VIJAYGARH JYOTISH RAY COLLEGE IN COLLABORATION WITH MICROBIOLOGISTS SOCIETY OF INDIA

Microbes are present in almost all spheres around us. Both the pathogenic and beneficial characters of the microorganism have been found. Microorganisms are utilized in different field e.g. in food industry, drug industry, agricultural field etc. To combat with the microbial diseases, we should be aware of the function of the microorganism. So, the continuous change in microbial character is a great challenge in our life. Thus, the theme of our seminar is the discussion of both the beneficial and virulent character of the microorganism.

CALL FOR PAPER IN EDITED BOOKS WITH ISBN NUMBER:

SUB-TOPICS:

- Antimicrobial resistance
- Environmental Microbiology
- Food Microbiology
- Natural Products
- Virology
- Immunology
- Genetics
- Bioinformatics
- Biotechnology
- Bioremediation
- Bio prospecting of Wastes

IMPORTANT DATES:

- Last date for registration with Abstract: 28/04/2022; Word limit: 300 words
- Last date for submission of full paper: 15/05/2022; Word limit: 2500 words

GUIDELINES:

- Template for paper will be provided to the participants who will contribute abstracts via registered mail.
- Paper should be free of plagiarism.

CALL FOR POSTER PRESENTATION:

THEME: RECENT TRENDS IN MICROBIOLOGY

SUB-TOPICS:

- Antimicrobial resistance
- Environmental Microbiology
- Food Microbiology
- Natural Products
- Virology
- Immunology
- Genetics
- Bioinformatics
- Biotechnology
- Bioremediation

Poster Size: 2ft X 3ft

Venue: VIJAYGARH JYOTISH RAY COLLEGE

Date: 18th May, 2022

REGISTRATION FEE:

- For Teachers: ₹1000/-
- For Research Scholars: ₹600/-
- For Students: ₹300/-

PAYMENT DETAILS:

Bank Account Number: 8566101000001
IFSC: CNRB0008566
Branch: Bijaygarh

REGISTRATION LINK: https://forms.gle/1uYrhysQaktNXFen7

PATRON:

Dr. Rajyasri Neogy
Principal

CONVENOR:

Dr. Sampa Debnath
Associate Professor in Microbiology
9433170705

JOINT CONVENOR:

- Dr. Prasenjit Das
Head of the department of Microbiology and IQAC
9433285855
- Dr. Gargi Saha Kesh
Associate Professor in Microbiology
8697555713

ORGANIZING COMMITTEE:

- Dr. Prasenjit Das
- Dr. Gargi Saha Kesh
- Dr. Sampa Debnath
- Dr. Saswati Gayen
- Dr. Shilajit Barua
- Dr. Sudip Samadder
- Dr. Surajit Bag
- Sri Pinaki Hazra
- Miss Sahana Ghosh

A Few Sample Pictures of Such Offline Programs


भारतीय प्रतिभूति और विनिमय बोर्ड
Securities and Exchange Board of India
आर्थिक शिक्षा कर्मशाला
वित्तीय शिक्षण कार्यशाला
FINANCIAL EDUCATION WORKSHOP
SEBI Toll Free Helpline: 1800 22 7575 / 1800 266 7575
NISM
Financial Education for Middle Income Investors
SEBI HAR INVESTOR KI TAAQAT
Golf Green
Central Park
SHAKTI
Bijoygarh State
General Hospital
Barobhuter Math
Raipur Rd E
PALLISREE
GANDHI
COLONY
Google
8/2, Bijoygarh, Jadavpur, Kolkata, West Bengal 700032, India
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West Bengal
India
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भारतीय प्रतिभूति और विनिमय बोर्ड
Securities and Exchange Board of India
NISM
Financial Education for Middle Income Investors
SEBI HAR INVESTOR KI TAAQAT
Golf Green
Central Park
SHAKTIGARH
Bijoygarh State
General Hospital
Barobhuter Math
Raipur Rd E
PALLISREE
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Kolkata, West Bengal, India
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Kolkata, West Bengal, India
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Research Methodology for Social Sciences
Introduction and Terminology
Kolkata, West Bengal, India
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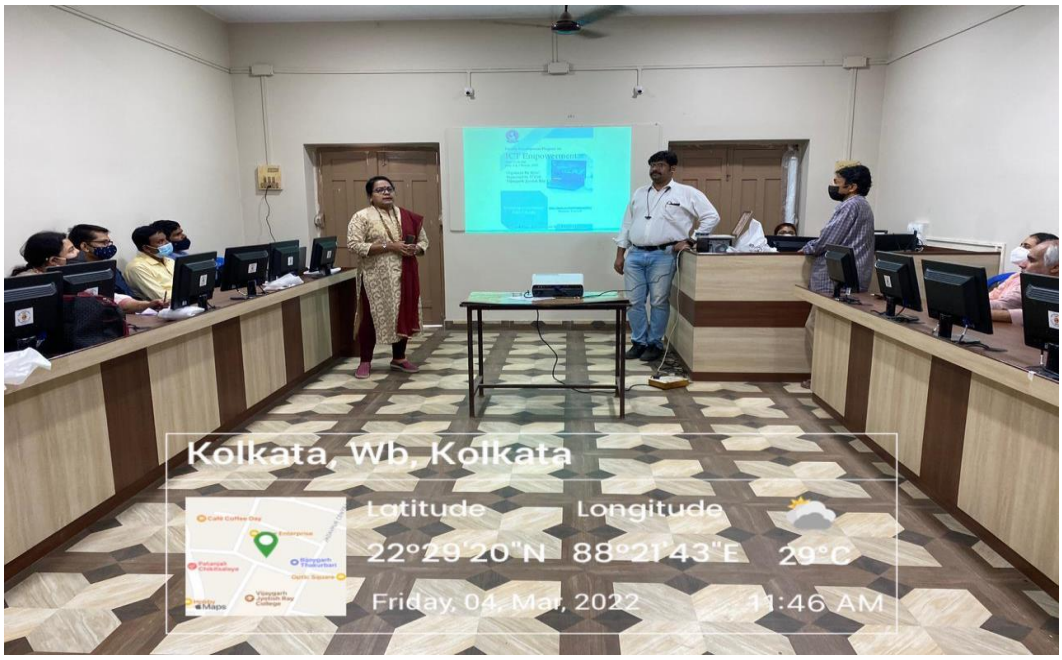
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Latitude
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Faculty Development Program on
ICT Empowerment
Time: 11.00 AM
Date: 3 & 4 March, 2022
Organized By IQAC
Supported by IT Cell
Vijaygarh Jyotish Ray College
Training Assistance:
EBLUESIS
Register Yourself
Kolkata, Wb, Kolkata
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28°C
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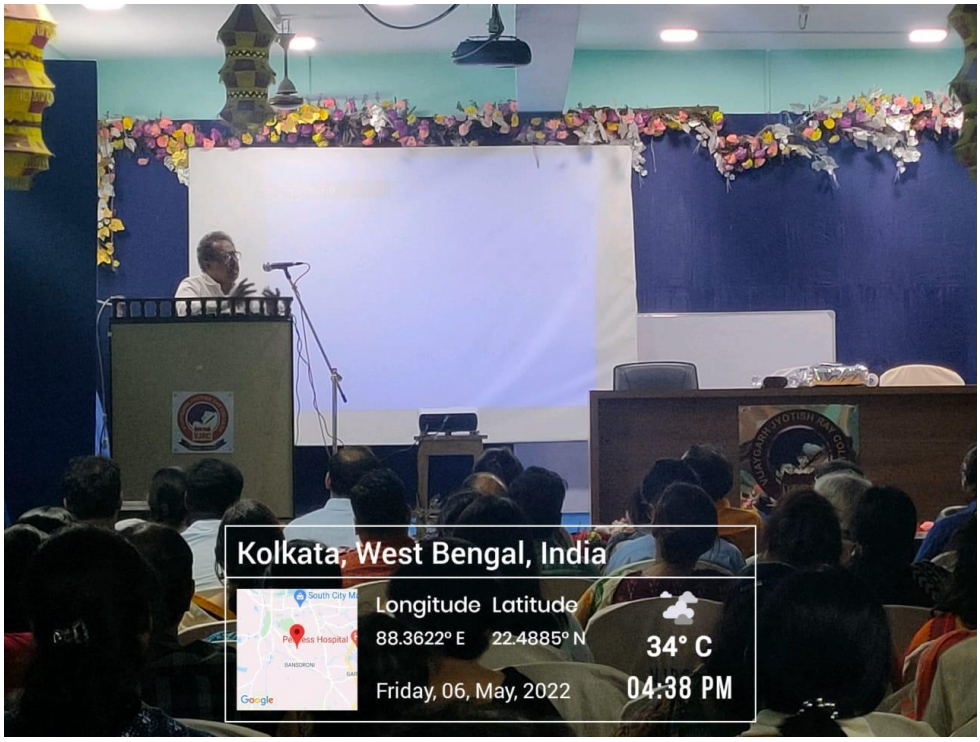
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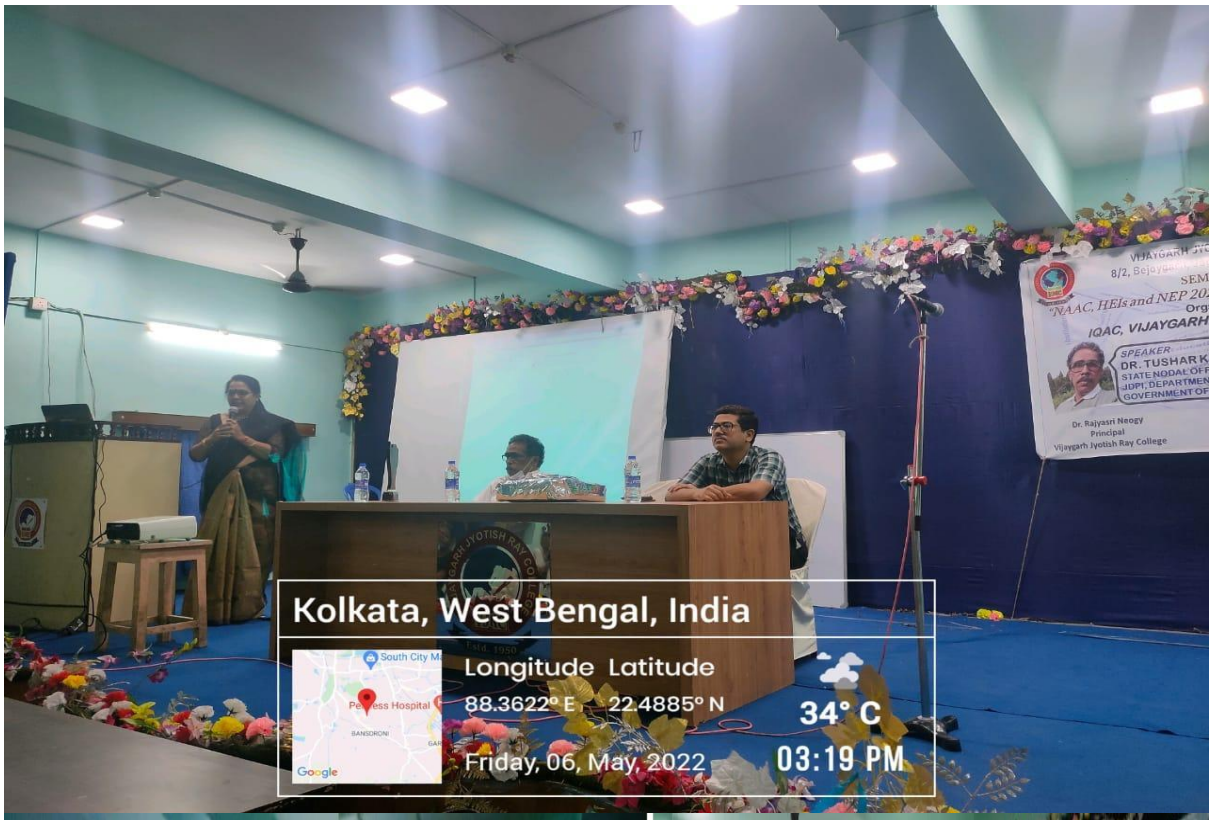
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Kolkata, West Bengal, India
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8/3, Bijoygarh, Jadavpur, Kolkata, West Bengal 700032, India
Kolkata
West Bengal
India
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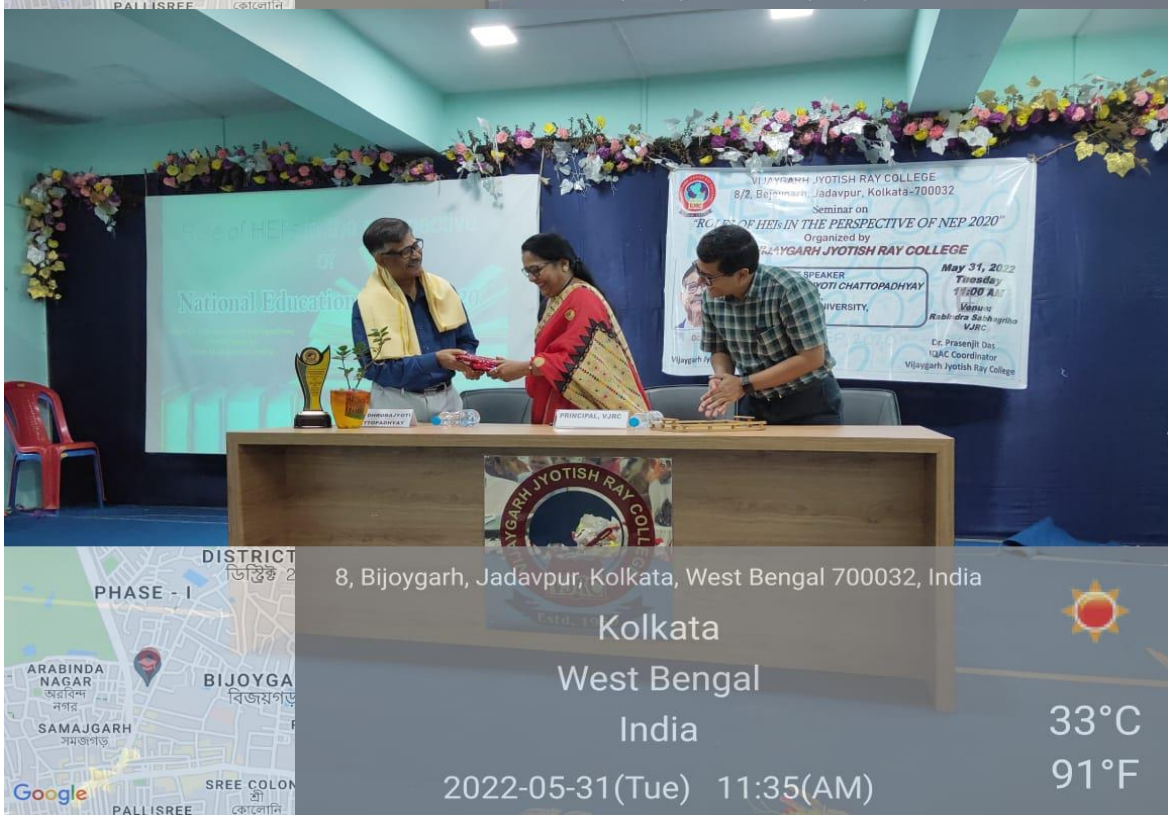
VIJAYGARH JYOTISH RAY COLLEGE
Seminar on
Organized by
VIJAYGARH JYOTISH RAY COLLEGE
8, Bijoygarh, Jadavpur, Kolkata, West Bengal 700032, India
Kolkata
West Bengal
India
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Kolkata
West Bengal
India
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A Few Sample Certificates of Participations Awarded in Such Programs

Certificate of Participation

This is to certify that

Dr. Saswati Gayen of Vijaygarh Jyotish Ray College

had participated in the seminar on "NAAC, HEIs and NEP 2020: CURRENT PERSPECTIVES" organized by Internal Quality Assurance Cell (IQAC), Vijaygarh Jyotish Ray College, Kolkata-700032 on May 6, 2022.

R. Nedgy

Principal
Vijaygarh Jyotish Ray College

Prosenjit Dey

IQAC Coordinator
Vijaygarh Jyotish Ray College

Certificate of Participation

One-day International Seminar, 2022, organized by Department of Microbiology, Vijaygarh Jyotish Ray College in collaboration with Microbiologists Society of India (MSI)

This is to certify that,

Dr. Saswati Gayen

of Vijaygarh Jyotish Ray College has participated and/or presented a poster in the International Seminar on "Recent Trends In Microbiology" held on 18th May, 2022 (9:30 am to 6:30 pm).

S. Debnath	Prasenjit Das		R. Neogy
Dr. Sampa Debnath	Dr. Prasenjit Das	Dr. Sapna Mukherjee	Dr. Rajyasri Neogy
Convenor	HOD and IQAC	State President (West	Patron and Principal
Vijaygarh Jyotish Ray College	Coordinator	Bengal)	Vijaygarh Jyotish Ray College
	Vijaygarh Jyotish Ray College	Microbiologists Society of India	

1/19/23, 3:23 PM IMG-20230119-WA0023.jpg

Certificate of Participation

One-day International Seminar, 2022, organized by Department of Microbiology, Vijaygarh Jyotish Ray College in collaboration with Microbiologists Society of India (MSI)

This is to certify that,

Dr. Gargi Saha Kesh

of Vijaygarh Jyotish Ray College has participated and/or presented a poster in the International Seminar on "Recent Trends In Microbiology" held on 18th May, 2022 (9:30 am to 6:30 pm).

S. Debnath	Prasenjit Das		R. Neogy
Dr. Sampa Debnath	Dr. Prasenjit Das	Dr. Sapna Mukherjee	Dr. Rajyasri Neogy
Convenor	HOD and IQAC	State President (West	Patron and Principal
Vijaygarh Jyotish Ray College	Coordinator	Bengal)	Vijaygarh Jyotish Ray College
	Vijaygarh Jyotish Ray College	Microbiologists Society of India	

Certificate of Participation

This is to certify that

DR. SASWATI GAYEN of Vijaygarh Jyotish Ray College

had participated in the seminar on "ROLES OF HEIs IN THE PERSPECTIVE OF NEP 2020" organized by Internal Quality Assurance Cell (IQAC), Vijaygarh Jyotish Ray College, Kolkata-700032 on May 31, 2022.

R. Mcopy

Principal
Vijaygarh Jyotish Ray College

Prasenjit Das

IQAC Coordinator
Vijaygarh Jyotish Ray College

Sample Letters of Curriculum Design of Add On/Certificate Courses

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 7.12.2021

To
The Head of the Department
Department of Bengali
Vijaygarh Jyotish Ray College
Kolkata-32

Sir,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course in "Proof Reading and Editing" for 34 Hours from 17th December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Proof Reading and Editing" for 34 Hours from 17th December, 2021, dated 5.12.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am pleased to nominate the following faculty members to design the curriculum for Certificate Course- Proof Reading and Editing.

1. Dr. Mrinal Birbangshi, (HOD), Asst. Prof.
2. Dr. Buddhadev Adhikary, Asst. Prof.

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Mukherjee

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 7.12.2021

To
The Head of the Department
Department of English
Vijaygarh Jyotish Ray College
Kolkata-32

Sir,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course in "Proof Reading and Editing" for 34 Hours from 17th December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Proof Reading and Editing" for 34 Hours from 17th December, 2021, dated 5.12.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am pleased to nominate the following faculty members to design the curriculum for Certificate Course- Proof Reading and Editing.

1. Dr. Swati Roy Choudhury, Asst. Prof.

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Roy

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 17.12.2021

To
The Head of the Department
Department of Commerce
Vijaygarh Jyotish Ray College
Kolkata-32

Sir,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course "Entrepreneurship Development" for 10 Days (30 Hours) on December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Entrepreneurship & Development" for 10 Days on December, 2021, dated 15.12.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am please to nominate the following faculty members to design the curriculum for Certificate Course-Entrepreneurship Development.

1. Sri Prabir Bhattacharya (HOD) Assoc. Prof.
2. Smt. Manisha Choudhury, Assoc. Prof.
3. Sri Sreyam Roy, SACT

The above-mentioned faculties are instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 17.12.2021

To
The Head of the Department
Department of Economics
Vijaygarh Jyotish Ray College
Kolkata-32

Sir,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course "Entrepreneurship Development" for 10 Days (30 Hours) on December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Entrepreneurship & Development" for 10 Days on December, 2021, dated 15.12.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am please to nominate the following faculty members to design the curriculum for Certificate Course- Entrepreneurship Development.

1. Dr. Isita Mukherjee Asst. Prof.

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 15.06.2021

To
The Head of the Department
Department of Journalism & Mass Communication
Vijaygarh Jyotish Ray College
Kolkata-32

Sir,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course "Digital & Social Media Journalism" for ^ Month (30 Hours) from June-December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Digital & Social Media Journalism" for Six Months from June-December, 2021, dated 13.06.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am please to nominate the following faculty member to design the curriculum for Certificate Course- Digital & Social Media Journalism

1. Dr. Bakul Srimany, SACT

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 15.06.2021

To
The Head of the Department
Department of Journalism & Mass Communication
Vijaygarh Jyotish Ray College
Kolkata-32

Sir,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course "Science Journalism" for Month (30 Hours) from June-December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Science Journalism" for Six Months from June-December, 2021, dated 13.06.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am please to nominate the following faculty member to design the curriculum for Certificate Course- Digital & Social Media Journalism

1. Dr. Arnab Kumar Banerjee, Asst. Prof.(HOD)

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Mukherjee

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 20.12.2021

To
The Head of the Department
Department of Physics
Vijaygarh Jyotish Ray College
Kolkata-32

Sir,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course "Basic of C-programming Language & Python" for 30 Hours from December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Basic of C-programming Language & Python" for 30 Hours from December, 2021, dated 17.12.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am please to nominate the following faculty member to design the curriculum for Certificate Course- Basic of C-programming Language & Python.

1. Sri Debashish Chatterjee. Assoc. Prof. (HOD)

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Mukherjee

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 20.12.2021

To
The Head of the Department
Department of Mathematics
Vijaygarh Jyotish Ray College
Kolkata-32

Madam,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course "Basic of C-programming Language & Python" for 30 Hours from December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Basic of C-programming Language & Python" for 30 Hours from December, 2021, dated 17.12.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am please to nominate the following faculty member to design the curriculum for Certificate Course- Basic of C-programming Language & Python.

1. Dr. Swarnali Sharma, Asst. Prof. (HOD)

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Ghosh

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR, KOLKATA-700 032
NAAC Accredited B+

Date: 7.12.2021

To
The Head of the Department
Department of Philosophy
Vijaygarh Jyotish Ray College
Kolkata-32

Madam,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course "Application for Yoga & Yogshastra for Healthy Lifestyle" for 30 Hours from December, 2021.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Application for Yoga & Yogshastra for Healthy Lifestyle" for 30 Days from December, 2021, dated 5.12.2021.

I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am pleased to nominate the following faculty member to design the curriculum for Certificate Course- Application for Yoga & Yogshastra for Healthy Lifestyle.

1. Dr. Laxmi Saha, Asst Prof. (HOD)

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students and mainly for the Healthy Lifestyle of them.

Rajyasri Mukherjee

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033 - 2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR , KOLKATA-700 032
NAAC Accredited B+

Date:1.6.2022

To
The Head of the Department
Department of Economics
Vijaygarh Jyotish Ray College
Kolkata-32

Sir,

Sub: - Assigning faculty for the design and development of curriculum for Certificate course "Environmental Sustainability" for 10 Days (30 Hours) from 7th June to 16th June, 2022.

Ref: Letter of permission for appointment of faculty for design and development of curriculum for Certificate course on "Environmental Sustainability" for 10 Days from 7th June to 16th June, 2022.
I appreciate the department for taking initiative to conduct such kind of programme. As per your recommendation, and importance of the course I am please to nominate the following faculty members to design the curriculum for Certificate Course- Environmental Sustainability.

1. Dr. Abhijit Das, Asst. Prof.
2. Dr. Isita Mukherjee, Asst. Prof.

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Roy

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033 - 2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR , KOLKATA-700 032
NAAC Accredited B+

Date:1.6.2022

Assigning faculty for the design and development of curriculum for Certificate course "Environmental Sustainability" for 10 Days (30 Hours) from 7th June to 16th June, 2022.

I am pleased to nominate the following faculty members to design the curriculum for Certificate Course- Environmental Sustainability.

1. Chief Advisor & Instructor: Dr. Pinaki Ranjan Chakraborty, Assoc. Prof. & Head, Dept. of Zoology
2. Internal Instructors: Dr. Shilajit Barua, Asst. Prof., Dept. of Microbiology
   Dr. Mahua Bhattacharya, Asst. Prof., Dept. of Botany
   Dr. Anindita Mukherjee, SACT, Dept. of Chemistry

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Roy

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033 -2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR , KOLKATA-700 032
NAAC Accredited B+

Date:4.4.2022

Assigning faculty for the design and development of curriculum for Certificate course "Preparation of various handicrafts and decorative items" for 10 Days (30 Hours) from 19th April to 21st April, 2022.

I am pleased to nominate the following faculty member to design the curriculum for Certificate Course- **"Preparation of various handicrafts and decorative items"** and to be the instructor for **"Jewellery Making".**

1. **Phalguni Chakraborty, SACT, Department of Education**

The above-mentioned faculty is hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Roy

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone: 033 -2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR , KOLKATA-700 032
NAAC Accredited B+

Date:18.5.2022

Assigning faculty for the design and development of curriculum for Certificate course "Citizenship, Constitutional Rights and Duties of Indians" for 30 Hours from 23.5.2022.

I am pleased to nominate the following faculty members to design the curriculum for Certificate Course.

1. Chief Advisor & Instructor: **Dr. Ruma Roy, Asst. Prof. & Head, Dept.of Political Science**

Internal Instructors:

2. **Md Jamirul Islam, Asst. Prof., Dept. of Political Science**
3. **Dr. Anindita Sarker, SACT, Dept. of Political Science**
4. **Dr. Amalendu Mazumder, Assoc. Prof. & Head, Dept. of Education**
5. **Sk. Rafique Ahmed, Assoc. Prof., Dept.of Education**
6. **Dr. Laxmi Saha, Asst. Prof. & Head, Dept. of Philosophy**
7. **Barsha Lahiri, SACT, Dept. of Political Science**
8. **Amrapali Bose, SACT, Dept. of Political Science**

The above-mentioned faculties are hereby instructed to design the curriculum taking into consideration the thrust areas of the respective field and ensure it should enhance the employability opportunities of the students.

Rajyasri Roy

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Library Resources

Statement of Library Books as on **31.03.2018** as per Accession Register

General Books as on 31.03.2017			**23,670**
Addition from 01.04.2017 to 31.03.2018			
General :	716		
Miscellaneous :	(+) 27		
		(+)	743
			24,413
H.S. Books as on 31.03.2017	5,043		
Addition from 01.04.2017 to 31.03.2018	--		
		(+)	5,043
			29,456
Weeding Out Books during 01.04.2017 to 31.03.2018		(-)	5,000
Total Books as on 31.03.2018 After Weeding Out			**24,456**
Less:			
Total Books Lost, Damaged etc. up to 31.03.2017	1480		
Books Lost, Damaged etc. during 01.4.2017 to 31.03.2018	(+) 15		
		(-)	1,495
Total Books in the Library as on 31.03.2018			**22,961**

Principal

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Prasenjit Dan
Library Convenor

Kaushik Samaddar
Library In-Charge

ANNEXURE – XII

Statement of Library Books as on 31.03.2019 as Per Accession Register

General Books as on 31.03.2018		**24,413**
Addition from 01.04.2018 to 31.03.2019		
Miscellaneous:	General: 417 (+) -	**417**
		(+) **24,830**
H.S. Books as on 31.03.2018	5,043	
Addition from 01.04.2018 to 31.03.2019	-	
		(+) 5,043
		29,873
Weeding Out Books upto 31.03.2019		(-) **5,000**
Total Books as on 31.03.2019 After Weeding Out		**24,873**
Less:		
Total Books Lost, Damaged etc. up to 31.03.2018	1495	
Books Lost, Damaged etc. during 01.4.2018to 31.03.2019	(+) 15	
		(-)1,510
Total Books in the Library as on 31.03.2019		**23,363**

Principal

Principal
Vijaygarh Jyotish Ray College
Kolkata - 700 032

Library Convenor

Library In-Charge

ANNEXURE - XII

Statement of Library Books as on 31.03.2020 as Per Accession Register

General Books as on 31.03.2019		24,830
Addition from 01.04.2019 to 31.03.2020		
Miscellaneous:	General: 522 (+) -	522
		(+) 25,352
H.S. Books as on 31.03.2019	5,043	
Addition from 01.04.2019 to 31.03.2020	-	
		(+) 5,043
		30,395
Weeding Out Books upto 31.03.2020		(-) 5,000
Total Books as on 31.03.2019 After Weeding Out		25,395
Less:		
Total Books Lost, Damaged etc. up to 31.03.2019	1510	
Books Lost, Damaged etc. during 01.4.2019 to 31.03.2020	(+) 15	
		(-)1,525
Total Books in the Library as on 31.03.2020		23,870

Librarian

Principal

Principal
Vijaygarh Jyotish Ray College
Kolkata - 700 032

ANAND JHUNJHUNWALA & CO. Chartered Accountants

LEGE

VIJAYGARH JYOTISH RAY COLLEGE
KOLKATA-32

Statement of Library Books as on 31.03.2021 as per Accession Register

Total no. of books as on 31.03.2020		: 23870
Newly added books from 01.04.2020 to 31.03.2021	(+)	: 502 [Accession no. 22988 to 23489]
Total no. of books		: 24372
Damage/lost books from 01.04.2020 to 31.03.2021	(-)	: 15
Total no. of books as on 31.03.2021		**: 24357**

Stock report as per book audit:

No. of books as per Library accession register		
Book record according to the accession register as on record dated 31.03.2021	Acc. No. 23489	
H.S. Books donated by RKM as on record dated 12.09.2001	Acc. No. 2896	Total **5000** books donated by RKM *weeding out on 04.02.2017
General Books donated by RKM as on record dated 20.09.2001	Acc. No. 2104	
H.S. Books Purchased by the college as on record dated 19.05.2004	Acc. No. 2053	Total H.S. Books **2147** (purchased by the college)
H.S. Books (miscellaneous from separate accession register) received accordingly 08.01.1977 & 01.04.1977	94	
Miscellaneous books from separate accession register as on record dated 16.12.2018	Acc. No. 261	
Total no. of books as per accession record	**30897**	

Weeding out/lost/ damage books as on 31.03.2021		
Weeding out the books of RKM on 04.02.2017	5000	
Damage/lost books as on 31.03.2020	1525	*According to last audit report
Damage/lost books as on 01.04.2020 to 31.03.2021	15	*Loss of five volumes per one thousand volumes of books issued/consulted in a year may be taken as reasonable provided such losses are not attributable to dishonesty or negligence. (GFR2017 by Govt. of India, Ministry of finance, Dept. of Expenditure)
Total damage/lost/ weeding out books	**6540**	

Total no. of books as per accessioned	:	30897
Total damage/lost/weeding out books	:	6540
Total no. of existing books as per record	**:**	**24357 (As on 31.03.2021)**

R. Neogy 13.2.23
Principal

Principal
Vijaygarh Jyotish Ray College
Kolkata -700 032

Mitra Roy & Datta
Chartered Accountants
FRN-322477E
13/02/2023
Partner
Sumanta Ghatak
Mem No. 051686
UDIN : 23051686BGYOKR9369

Librarian

LIBRARIAN
VIJAYGARH JYOTISH RAY COLLEGE
LIBRARY

VIJAYGARH JYOTISH RAY COLLEGE
KOLKATA-32

Statement of Library Books as on 31.03.2022 as per Accession Register

Total no. of books as on 31.03.2021		: 24357
Newly added books from 01.04.2021 to 31.03.2022	(+)	: 811 [Accession no. 23490 to 24300]
Total no. of books		: 25168
Damage/lost books from 01.04.2021 to 31.03.2022	(-)	: 15
Total no. of books as on 31.03.2022		**: 25153**

Stock report as per book audit:

No. of books as per Library accession register		
Book record according to the accession register as on record dated 31.03.2022	Acc. No. 24300	
H.S. Books donated by RKM as on record dated 12.09.2001	Acc. No. 2896	Total **5000** books donated by RKM *weeding out on 04.02.2017
General Books donated by RKM as on record dated 20.09.2001	Acc. No. 2104	
H.S. Books Purchased by the college as on record dated 19.05.2004	Acc. No. 2053	Total H.S. Books **2147** (purchased by the college)
H.S. Books (miscellaneous from separate accession register) received accordingly 08.01.1977 & 01.04.1977	94	
Miscellaneous books from separate accession register as on record dated 16.12.2018	Acc. No. 261	
Total no. of books as per accession record	**31708**	

Weeding out/lost/ damage books as on 31.03.2022		
Weeding out the books of RKM on 04.02.2017	5000	
Damage/lost books as on 31.03.2021	1540	*According to last audit report
Damage/lost books as on 01.04.2021 to 31.03.2022	15	*Loss of five volumes per one thousand volumes of books issued/consulted in a year may be taken as reasonable provided such losses are not attributable to dishonesty or negligence. (GFR2017 by Govt. of India, Ministry of finance, Dept. of Expenditure)
Total damage/lost/ weeding out books	**6555**	

Total no. of books as per accessioned	:	31708
Total damage/lost/weeding out books	:	6555
Total no. of existing books as per record	**:**	**25153 (As on 31.03.2022)**

R. Roy 13.2.23

Principal

Principal
Vijaygarh Jyotish Ray College
Kolkata -700 032

Mitra Roy & Datta
Chartered Accountants
FRN-322477E

13/02/2023

Partner
Sumata Ghatak
Mem no. 051686

UDIN: 23051686BGYOKS7144

Librarian

LIBRARIAN
VIJAYGARH JYOTISH RAY COLLEGE
LIBRARY

Phone: 033-2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2, BEJOYGARH, JADAVPUR , KOLKATA-700 032
NAAC Accredited B+

Ref. No.....

Date:

Stock Verification report of Seminar Library (Departmental Library) as on 31.03.2023

Sl. No.	Name of Department	Existing total No. of Books
1.	Education	330
2.	Bengali	761
3.	English	268
4.	Chemistry	191
5.	Zoology	321
6.	Botany	266
7.	Political Science	160
8.	Microbiology	305
9.	Economics	161
10.	Physics	238
11.	History	231

LIBRARIAN
VIJAYGARH JYOTISH RAY COLLEGE
LIBRARY

Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

Phone : 2412-4082

VIJAYGARH JYOTISH RAY COLLEGE

(Affiliated to the University of Calcutta)
8/2. Bejoygarh, Jadavpur, Kolkata-700032
ACCREDITED BY THE NAAC – B+ Grade.

Ref. No. 4/Lib(21-22)/WO Date: 15/02/2022

To

Mr. Dibyendu Tapader,

Tee Dee Publications (P) LTD.

58, Creek Row, Ground Floor, Kolkata-14

Subj. Work order for books of commerce

Dear Mr. Tapader,

This is to inform you that your quotation has been the lowest among the three submitted quotations. So please supply the books as per requisition for the department of commerce to the central library within 10 days of receiving this letter.

Keep in mind that you have to supply all books as per the percentage of discount in your quotation.

N.B. Requisition lists are attached herewith.

R. Mes 15.2.22

Principal

Principal
Vijaygarh Jyotish Ray College
Kolkata -700 032

Acc. No. 23985 – 24098

75

Tee Dee Publications (P) Ltd.

H.O. : 58, Creek Row, Ground Floor, Kolkata – 700 014, Tel : (033) 2234-8615
Sales Counter : 12B, Bankim Chatterjee Street, Kolkata – 700 073, Tel : 8017798863
E-mail : teedeepub@yahoo.co.in

BILL 3649 | DATE : 16/03/22

Order No. 4/Lib(21-22)/WO | Challan No. 002942

To BIJAYGARH JYOTISH RAY COLLEGE

8/2, BIJAYGARH, JADAVPUR, KOLKATA – 700 032

Quantity	ITEMS	Unit Price	Gross Amount Rs.	Net Amount Rs.
05	Financial Accounting-II – Prof. Amitava Basu	600.00	3,000.00	2,325.00
03	Company Law (English Version) — D. L. Datta	350.00	1,050.00	813.75
03	Information Technology & Its Application in Business — S. Dawn and P. Banerjee	350.00	1,050.00	813.75
05	Cost Management Accounting II – Prof. Amitava Basu	330.00	1,650.00	1,278.75
04	Entrepreneurship Development and Business Ethics — Dr. B Chandra & Dr. B. Biswas	330.00	1,320.00	1,023.00
03	Udyog Unnayan O Babsayik Nitisastra — Dr. B. Chandra & Dr. B. Biswas	300.00	900.00	697.50
03	Macroeconomic and Advance Business Mathematics — Dr. Bipul De and Dr. Sriharsha Baidya	350.00	1,050.00	813.75
03	Microeconomics II & Indian Economy – Dr. Bipul De and Dr. S. Majumder	330.00	990.00	767.25
05	Corporate Accounting — Prof. Amitava Basu	600.00	3,000.00	2,325.00
03	An Edifice of Reserch Methodology and Project Work — A. Das & M. Sengupta	250.00	750.00	581.25
02	Financial Reporting & Financial Statement Analysis — Prof. Joyanta Ghosh	600.00	1,200.00	930.00
02	Arthik Protibedan O Arthik Biborani Bisleson — Prof. Joyanta Ghosh	600.00	1,200.00	930.00
03	E-Commerce & Business Communication — D. L.. Datta and Dr. S. K. Debnath	350.00	1,050.00	813.75
05	Poribesh — Dr. Anish Chottapadhya	280.00	1,400.00	1,085.00
05	Marketing Management and HRM — Dr. Shrutinath Praharaj	330.00	1,650.00	1,278.75
05	Computerised Accounting & E-Filing — Agnihorti & Das	500.00	2,500.00	1,937.50
	Bank Details : Tee Dee Publications Pvt Ltd HDFC Account No 50200013237929 IFSC Code HDFC0002664 College Street Branch PAN NO. AAACT9289M			18,414.00

Rupees Seven Thousand fifty three only.

E. & O. E.

TERMS & CONDITION

1. Books once sold, will not be taken back/defect in Binding, will be rectified.
2. Payment to be made by Cash / Local Cheque / Demand Draft.
3. In case of bouncing of Cheque, actual bank charges will be charged and failure of payment within 15 days will attract legal action.

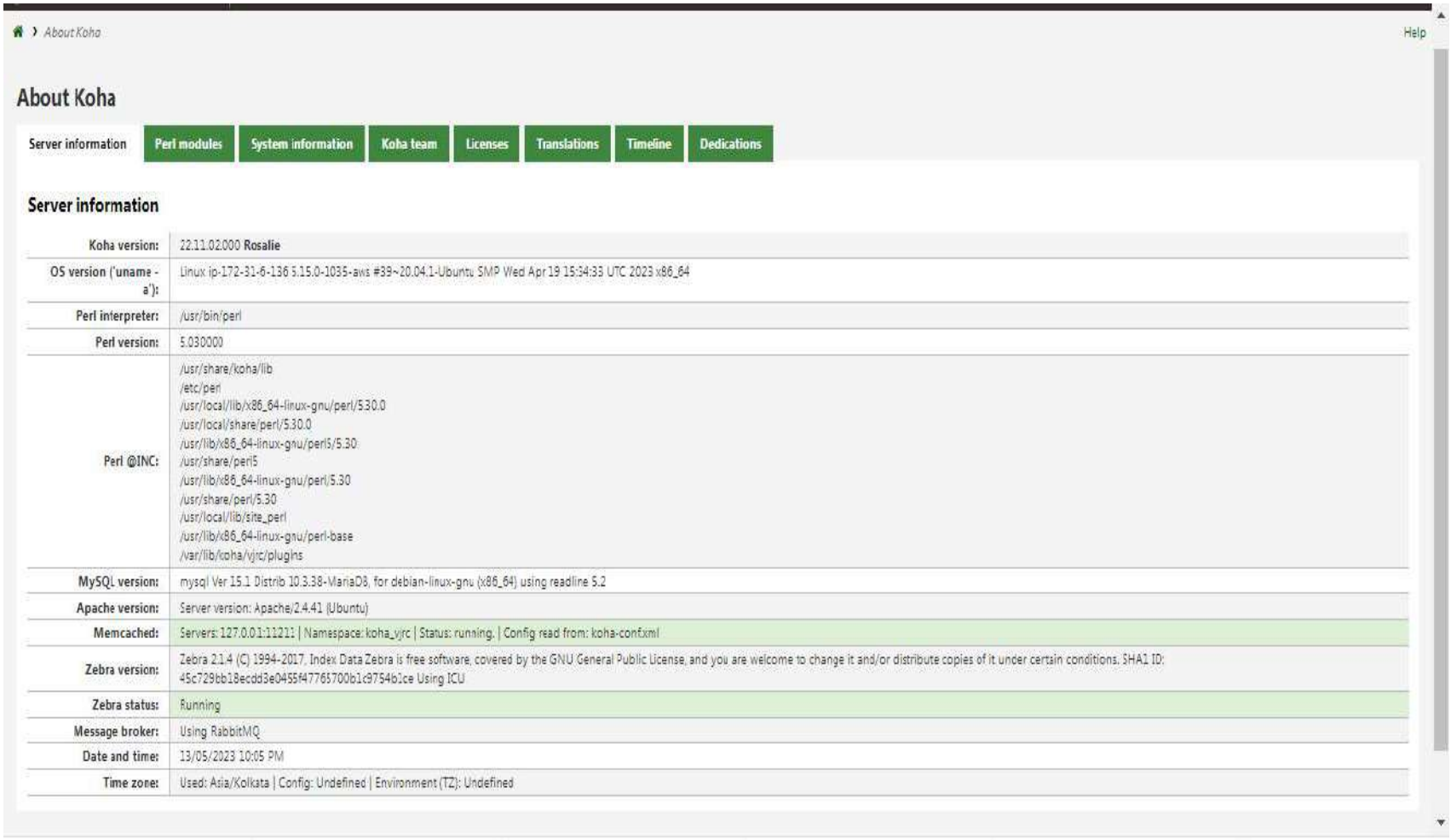
For Tee Dee Publications (P) Ltd.

A Quality Publishers for Value Added Books

Received 59 copies of books 16/3/22

LIBRARIAN
VIJAYGARH JYOTISH RAY COLL.
LIBRARY

Koha (version: 22.11.02.000 Rosalie)



Rajyasri Neogy
Dr. Rajyasri Neogy
Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

4.2.4.1. Library footfall record: (June,21 to Aug,22)

Average Students attendance: 4074/121 = 33.66%

Average teachers' attendance: 705/105 = 6.71%

Sl. No.	Date	User attendance (students)	User attendance (teachers)
1	16-11-2021	6	3
2	24-11-2021	12	4
3	25-11-2021	13	15
4	26-11-2021	39	-
5	29-11-2021	55	-
6	30-11-2021	36	4
7	01-12-2021	38	5
8	02-12-2021	42	4
9	03-12-2021	25	4
10	06-12-2021	9	1
11	07-12-2021	6	2
12	08-12-2021	31	2
13	09-12-2021	38	7
14	10-12-2021	19	3
15	13-12-2021	20	6
16	14-12-2021	4	4
17	15-12-2021	11	2
18	16-12-2021	5	2
19	17-12-2021	42	6
20	21-12-2021	31	10
21	22-12-2021	62	2
22	23-12-2021	53	9
23	24-12-2021	26	5
24	27-12-2021	26	5
25	28-12-2021	32	3
26	29-12-2021	21	-
27	30-12-2021	12	-
28	03/02/2022	39	07
29	07/02/2022	50	04
30	08/03/2022	28	12
31	09/02/2022	40	07
32	10/02/2022	44	10
33	15/02/2022	-	09
34	16/02/2022	49	10
35	17/02/2022	51	12
36	18/02/2022	48	12
37	19/02/2022	03	-
38	21/02/2022	04	04
39	22/02/2022	45	19
40	23/02/2022	44	10
41	24/02/2022	53	09
42	25/02/2022	31	11

Rajyasri Neogy
Dr. Rajyasri Neogy
Principal
Vidyasagar Jyotish Ray College
Kolkata-700 032

43	26/02/2022	04	-
44	28/02/2022	23	11
45	02/03/2022	54	07
46	03/03/2022	41	07
47	04/03/2022	27	08
48	07/03/2022	11	11
49	08/03/2022	32	06
50	09/03/2022	22	12
51	10/03/2022	05	10
52	10/03/2022	51	10
53	11/03/2022	51	12
54	14/03/2022	40	11
55	15/03/2022	68	-
56	16/03/2022	60	20
57	17/03/2022	29	11
58	21/03/2022	29	05
59	23/03/2022	27	07
60	24/03/2022	03	02
61	29/03/2022	72	10
62	31/03/2022	60	09
63	01/04/2022	50	09
64	02/04/2022	41	-
65	04/04/2022	16	-
66	05/004/2022	169	11
67	06/04/2022	46	10
68	07/04/2022	-	08
69	08/04/2022	58	05
70	11/04/2022	70	07
71	12/04/2022	77	11
72	13/04/2022	78	01
73	18/04/2022	138	10
74	19/04/2022	-	09
75	20/04/2022	22	11
76	21/04/2022	35	12
77	21/042022	35	12
78	22/04/2022	35	05
79	23/04/2022	80	-
80	25/04/2022	05	-
81	26/04/2022	15	04
82	27/04/2022	70	09
83	28/04/2022	45	08
84	29/04/2022	62	05
85	05/05/2022	01	01
86	06/05/2022	12	04
87	10/05/2022	01	-
88	11/05/2022	49	02
89	26/05/2022	26	-
90	30/05/2022	23	01

Rajyasri Neogy
Dr. Rajyasri Neogy
Principal
Vidyasagar Jyotish Ray College
Kolkata-700 032

91	01/06/2022	13	-
92	03/06/2022	09	-
93	06/06/2022	10	-
94	07/06/2022	09	-
95	08/06/2022	16	-
96	10/06/2022	08	-
97	13/06/2022	08	-
98	14/06/2022	11	-
99	15/06/2022	32	12
100	16/06/2022	37	05
101	17/06/2022	41	04
102	18/06/2022	08	-
103	20/06/2022	32	04
104	21/06/2022	35	07
105	22/06/2022	38	09
106	23/06/2022	24	04
107	24/06/2022	28	04
108	25/06/2022	35	-
109	27/06/2022	-	02
110	28/06/2022	35	-
111	09/07/2022	04	-
112	11/07/2022	19	-
113	12/07/2022	-	02
114	19/07/2022	-	10
115	03/08/2022	-	03
116	04/08/2022	05	03
117	05/08/2022	-	05
118	06/08/2022	-	01
119	07/08/2022	-	04
120	08/08/2022	05	04
121	10/08/2022	16	04
122	12/08/2022	-	06
123	13/08/2022	-	01
124	16/08/2022	11	08
125	17/08/2022	59	09
126	22/08/2022	47	04
127	23/08/2022	26	07
128	24/08/2022	47	11
129	25/08/2022	29	-
130	26/08/2022	31	-
131	29/08/2022	42	08
132	30/08/2022	32	07
133	31/08/2022	34	03

Rajyasri Neogy
Dr. Rajyasri Neogy
Principal
Vijaygarh Jyotish Ray College
Kolkata-700 032

N-list user statistics:

Name	Username	Department	Month	Year	Times Logged In	Page Views
Sudipta Shee	librarian.vjrc@gmail.com	LIBRARY	6	2022	1	2
Soma Majumder	majumdersoma9@gmail.com	PHYSIOLOGY	6	2022	1	2
Palashpriya Halder	palashpriyavjrcnaac@gmail.com	ECONOMICS	4	2022	2	2
Palashpriya Halder	palashpriyavjrcnaac@gmail.com	ECONOMICS	3	2022	2	2
Debajyoti Das	deb20082008@gmail.com	library	2	2022	1	2
Sudipta Shee	librarian.vjrc@gmail.com	LIBRARY	2	2022	12	51
Soma Majumder	majumdersoma9@gmail.com	PHYSIOLOGY	2	2022	1	2
Raju Sardar	rajusardarsc@gmail.com	Dept. of Journalism	2	2022	1	3
Surajit Sarkar	surajit.83@gmail.com	Adminsitrator	2	2022	1	3
Soma Majumder	majumdersoma9@gmail.com	PHYSIOLOGY	1	2022	2	111

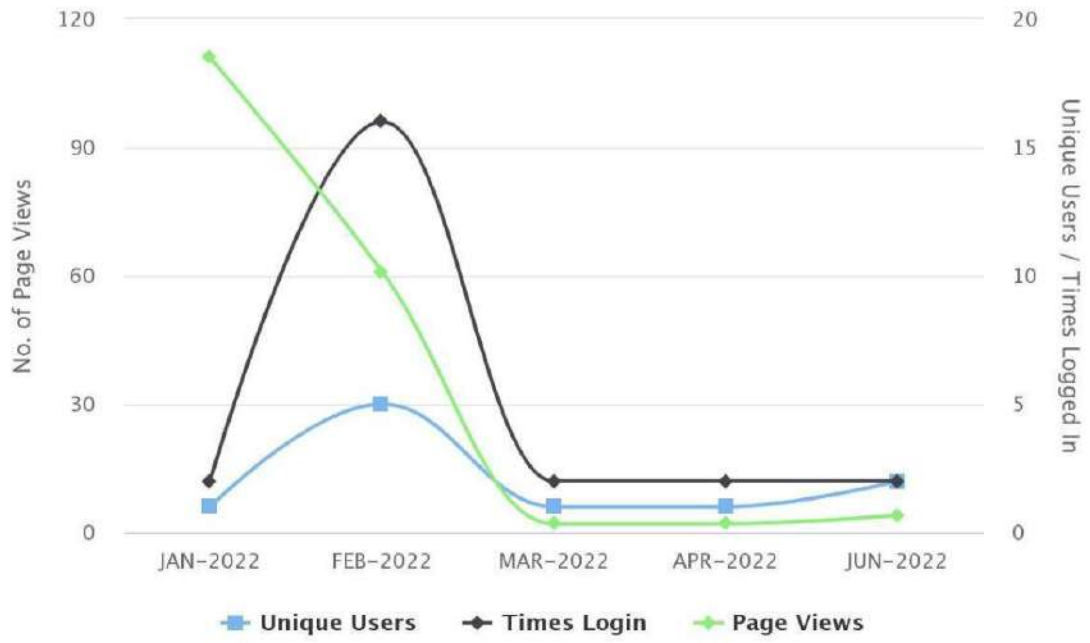
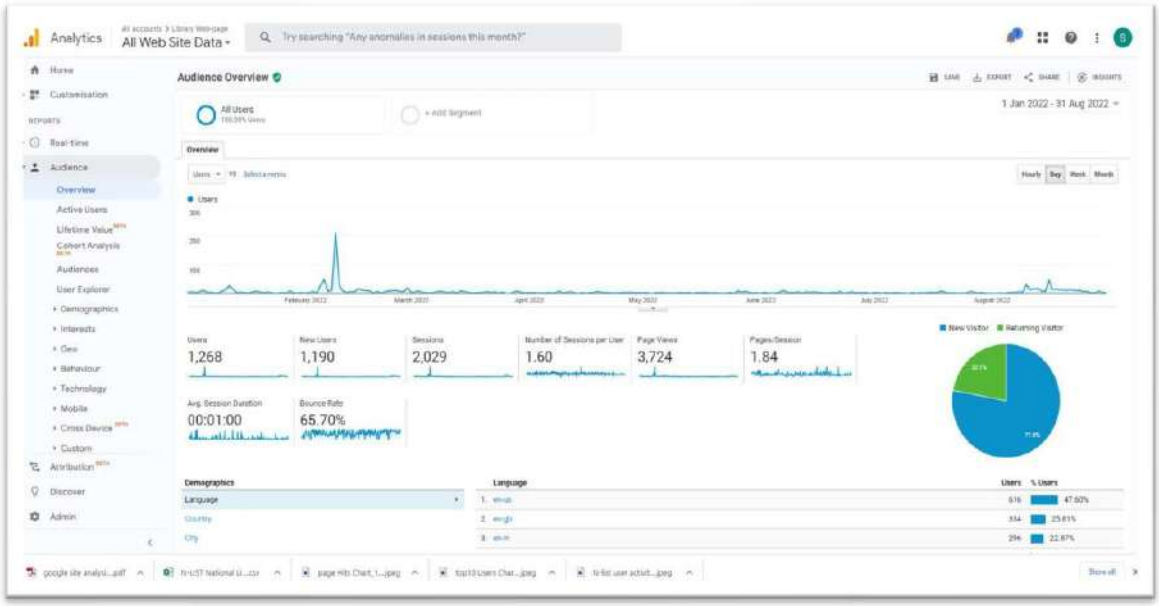
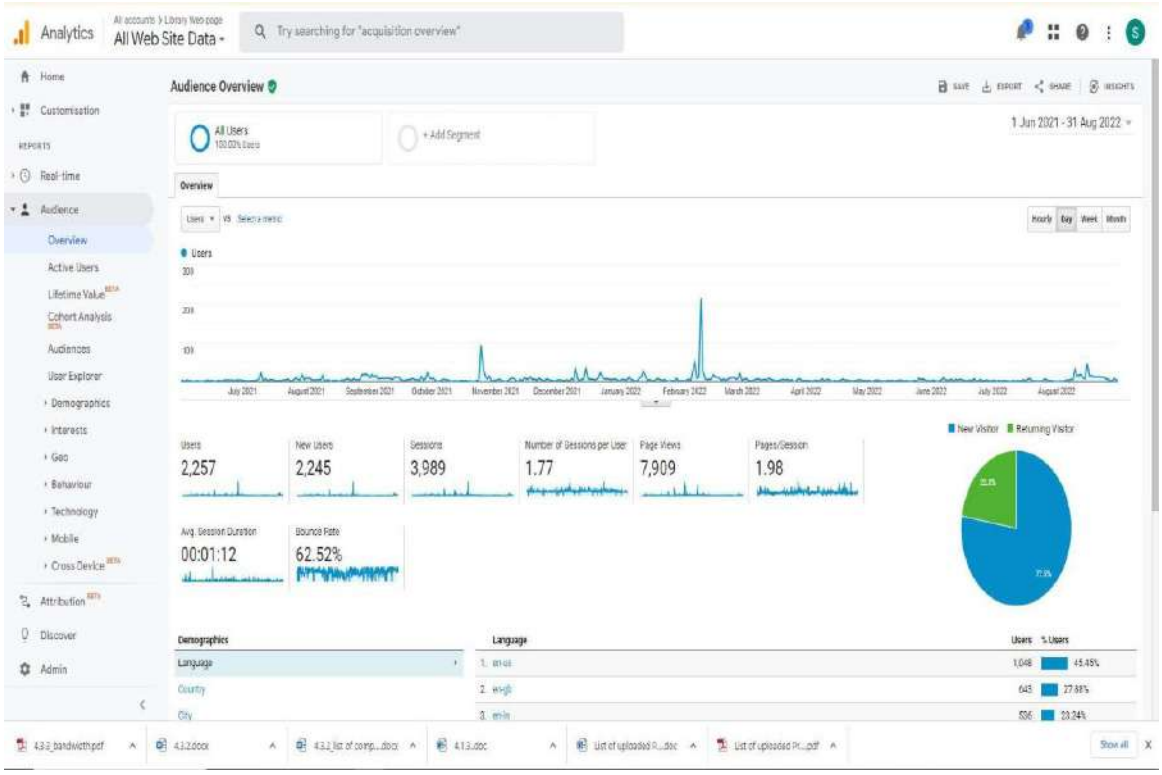


Fig 1. N-List user activity statistics

Rajyasri Neogy
Dr. Rajyasri Neogy
Principal
Vidyasagar Junior College
Kolkata-700 032

Library website access report: (click here for website)





Rajyasri Neogy
Dr. Rajyasri Neogy
Principal
Vijaygarh Jyotish Ray College

Information and Library Network Centre
(An Autonomous Inter-University Centre of UGC)
सूचना एवं पुस्तकालय नेटवर्क केन्द्र
(विश्वविद्यालय अनुदान आयोग का स्वायत्त अंतर विश्वविद्यालय केन्द्र)

National Library and Information Services Infrastructure of Scholarly Content (N-LIST)

Invoice

Ref No.: INF/N-LIST/2022/6533

Date: 2022-02-18
Invoice No.: NLIST/21-22/2581
College GST No.: 19AAAJV1005C1ZK
College GST State Code: WB [19]

Name and Address of Subscriber

To
The Principal
Vijaygarh Jyotish Ray College
8/2, Bijoygarh
Kolkata
West Bengal - 700032

SR. No.	Membership Fee	Period of Membership	Amount In Rs
1	N-LIST Annual Membership Fee	April 2022 to March 2023	5,000.00
		CGST@0.00%	0.00
		SGST@0.00%	0.00
		IGST@18.00%	900.00
		Total	**5,900.00**

Rupees Five Thousand Nine Hundred Only

GSTIN: 24AAATI1480J1ZS
TDS is not applicable on annual membership fee.

Sincerely Yours

Ashok Kumar Rai
Scientist-E(CS)

---------- Cut Here ----------

N-LIST MEMBERSHIP FEE RECEIPT

Receipt Date: 2022-02-18

Receipt No: 53891

Received with thanks from Vijaygarh Jyotish Ray College, Kolkata, West Bengal

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Rs. 5900

Sincerely Yours

For Administrative Officer(Finance)

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Minutes

The minutes of the meeting of the library committee held on **07.12.2021 (Tuesday)**.

The meeting started at 2.30 P.M. in library Dr. Rajyasri Neogy, on the chair. The following resolutions were adopted unanimously. Present members in the following,

1. Dr. Rajyasri Neogy, Principal, (Chairman)
2. Sudipta Shee, Librarian, (Convenor)
3. Dr. Mrinal Birbansi, HOD Begnali, (Member)
4. Dr. Amalendu Mazumder, HOD Education (Member)
5. Dr. Arnab kr. Banerjee, HOD Journalism & Mass.com. (Member)
6. Sri. Prabir Bhattacharya, HOD Commerce (Member)
7. Dr. Swarnali Sharma, HOD Mathematics (Member)
8. Sri Debashis Chatterjee, HOD Physics (Member)
9. Dr. Sumita Roy, HOD Chemistry (Member)
10. Dr. Prasenjit Das, HOD Microbiology (Member)
11. Dr. Urmi Roy, HOD Botany (Member)
12. Dr. Abhijit Das, HOD Economics (Member)
13. Soma Mazumber, HOD Physiology (Member)
14. Dr. Mahua Bhattacharya, HOD Envs. (Member)
15. Dr. Pinakiranjan Chakraborty, HOD Zoology (Member)
16. Dr. Laxmi Saha, representative of dept. of Philosophy on behalf of HOD
17. Dr. Isita Mukherjee, representative of dept. of economics
18. Dr. Swati Roy Chowdhury, representative of dept. of English on behalf of HOD.

LIBRARIAN
VIJAYGARH JYOTISH RAY COLLEGE
LIBRARY

R. Neogy

Principal
Vijaygarh Jyotish Ray College
Kolkata -700 032

Resolution No. 1:

The resolution of the previous meeting taken on dated 08.02.2021 is confirmed.

Resolution No. 2: Book purchase from RUSA fund:

Dr. Prasenjit Das, Coordinator of IQAC said that all department may be allocated funds to purchase new books from RUSA fund of 12 lakhs. All departments may prepare lists of books to be purchased from the fund.

Resolution No. 3: The library up gradation for upcoming NAAC.

3.i. The library needed a very much up gradation of library management software (LMS) KOHA. Library runs version 16.11.00 but now stable version of koha 21.11.00 has been launched. Web OPAC (Online public access catalogue) must be introduced for current need of user accessibility. The library membership card is also made by koha.

3.ii. Library server: Library needs a good server machine with AC server room and high bandwidth network for better service and smooth running of LMS.

3.iii. Library website: Proposed content management software is to be bought for better performance of library website (like, Wordpress, Drupal). Google site not fulfill the actual need properly, like user statistics report, documentation process etc.

3.iv. Space management: Library needs a store room and a server room for unused or less used books. Proposed that the proper utilization of the small room at the back of the library. Room no. 203 may be used as the server room for the library.

3.v. Digital library: The library should introduce a digital library. Requirements

- ✓ User interface
- ✓ Purchase e-resources, like databases, e-books, e-journals etc.
- ✓ Own digital repository
- ✓ Build up e-modules for degree courses by the teachers of VJRC,

Resolution No. 4: Braille section: The library introduces a Braille section, Requirements

- ✓ Dedicated place for setup
- ✓ Purchase Braille books and audiobooks.
- ✓ Dedicated computer system with screen reading software and head phone setup.

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- ✓ Library can prepare its own audiobooks with the help of voluntary services by the students and also teachers of college.

Resolution No. 5: Community service:

The library can provide access to outside students only for reading purposes for a particular time. Purchase more books for competitive examination.

Resolution No. 6: The library needs pest control on a regular basis like thrice a year and also dusting.

Resolution No. 7: Stock verification as an urgent need before NAAC.

Resolution No. 8: The library can introduce inter-library loan (ILL) facility.

Resolution No. 9: The library needs to bind the back-volume journal year-wise.

Resolution No. 10: The library should promote its digital accessibility. All departments also promote digital accessibility and may organize orientation programmes.

Resolution No. 11: Interior decoration of Library:

There should be need a discussion about the Interior decoration of Library so that it looks spacious and users can get a pleasant ambience for reading. It also needs more space for the stack area and internal work of the library.

Resolution No. 12: Librarian produces a report on expenditure for financial year 2020-21. All present members discuss about library fund and how to utilize the fund.

Convener

LIBRARIAN
VIJAYGARH JYOTISH RAY COLLEGE
LIBRARY

Chairman

Principal
Vijaygarh Jyotish Ray College
Kolkata -700 032

Vijaygarh Jyotish Ray College
Kolkata 700 032

Audited Statement of Expenditure for infrastructure Development & Augmentation and Maintenance of Physical facilities & Academic support facilities excluding Salary component during the last five years

Financial Years 2017 - 18 to 2021 - 22

Head of Expenditure	Item of Expenditure	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	Total Outlay	Percentage
	Infrastructure Development & Augmentation							
Expenditure for Infrastructure Augmentation	Building	3,31,193.00	53,51,621.00	7,70,062.00	3,19,582.00	1,31,306.00	69,03,764.00	
	Electrical Goods	4,29,206.00	2,97,277.00	1,94,048.00	1,41,512.00	52,137.00	11,14,180.00	
	Computer Purchased	7,53,764.00	5,58,177.00	3,14,066.00	31,710.00	10,93,729.00	27,51,446.00	
	Furniture & Fixtures	7,62,758.00	2,37,254.00	1,47,800.00	51,750.00	55,321.00	12,54,883.00	
	Black Board	18,210.00	15,780.00	36,970.00	-	-	70,960.00	
	Virtual Class room	3,29,558.00	-	-	-	-	3,29,558.00	
	Other Equipment	50,420.00	-	-	-	9,300.00	59,720.00	
	Biometric Attendace System	14,500.00	-	-	-	-	14,500.00	
	Laboratory equipment's	1,14,364.00	81,428.00	26,72,704.00	23,498.00	28,475.00	29,20,469.00	
	SUB TOTAL	**28,03,973.00**	**65,41,537.00**	**41,35,650.00**	**5,68,052.00**	**13,70,268.00**	**1,54,19,480.00**	**51.67%**
Expenditure on Physical Facilities	**Maintenance of Faculutues & Academic Support Facilities**							
	Building repair and renewals	2575882	17,96,095.00	7,56,847.00	2,70,131.00	1,52,556.00	55,51,511.00	
	Computer maintenance	75300	71,543.00	1,42,853.00	36,945.00	15,623.00	3,42,264.00	
	Security	122000	1,49,000.00	1,42,000.00	1,49,600.00	1,47,400.00	7,10,000.00	
	Charge for web-based facilities (ICT)	0	56,294.00	4,000.00	0.00	0.00	60,294.00	
	CCTV	0	4,720.00	-	0.00	0.00	4,720.00	
	Electric Bill	150872	49,560.00	72,231.00	0.00	0.00	2,72,663.00	
	Internet charges	6618	-	8,050.00	26,306.00	95,197.00	1,36,171.00	
	Fire extinguisher	27904	-	7,493.00	0.00	0.00	35,397.00	
	Gardening & Beautification	121800	-	6,820.00	0.00	0.00	1,28,620.00	
	Estimation Charges	0	31,000.00	10,000.00	12,500.00	0.00	53,500.00	
	Generator maintenance	0	-	-	4,300.00	0.00	4,300.00	

R. Mondal
Principal
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Mitra Roy & Datta
Chartered Accountants
FRN-322477E
Partner
Sumanta Ghatak
Mem No. 051686
UDIN: 23051686BGYOMH8570

Head of Expenditure	Item of Expenditure	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	Total Outlay	Percentage
Expenditure for Academic Facilities	Laboratory expenses for consumables	338285	6,29,582.00	2,58,909.00	33,131.00	61,919.00	13,21,826.00	
	Diploma Course Fees	0	-	-	22,200.00	27,000.00	49,200.00	
	VJRC Add-on Certificate Course	0	-	-	17,700.00	73,450.00	91,150.00	
	Papers, magazines etc., in library	16696	65,311.00	23,374.00	10,881.00	9,604.00	1,25,866.00	
	Seminar/Webinar/Workshop/Competition, etc.	17219	13,100.00	1,58,321.00	0.00	37,782.00	2,26,422.00	
	Publication	0	-	-	0.00	74,600.00	74,600.00	
	Library Books & e-Journal	443610	79,162.00	2,67,480.00	1,71,395.00	2,60,728.00	12,22,375.00	
	Affiliation fees	41000	21,000.00	-	0.00	5,000.00	67,000.00	
	Reimbursement of Professional Fees	0.00	-	-	0.00	42,011.00	42,011.00	
	Radio Kolkata	0.00	-	-	0.00	1,37,576.00	1,37,576.00	
	SUB TOTAL	**39,37,186.00**	**29,66,367.00**	**18,58,378.00**	**7,55,089.00**	**11,40,446.00**	**1,06,57,466.00**	**35.71%**
	ELIGIBLE EXPENDITURE	**67,41,159.00**	**95,07,904.00**	**59,94,028.00**	**13,23,141.00**	**25,10,714.00**	**2,60,76,946.00**	
Administrative Expenditure	**Administrative Expenditure**							
	Excursion	-	-	-	-	**335.00**	335.00	
	IQAC	328.00	10,784.00	**36,359.00**	**300.00**	**3,674.00**	51,445.00	
	NAAC	3,81,240.00	696.00	**9,960.00**	-	**4,608.00**	3,96,504.00	
	Postage & Telegram	608.00	-	**512.00**	**40.00**	**135.00**	1,295.00	
	Bank Charges	8,037.50	16,597.00	6,775.83	7,288.91	19,447.50	58,146.74	
	Contingency for different purpose	4,48,801.00	3,55,637.40	2,43,459.12	55,919.50	1,02,483.56	12,06,300.58	
	Contingency for COVID-19	-	-	1,00,000.00	1,21,924.00	36,454.00	2,58,378.00	
	Conveyance	74,350.00	1,04,620.00	1,46,095.00	75,416.00	1,08,739.00	5,09,220.00	
	Canteen	6,000.00	6,500.00	5,500.00	5,500.00	6,000.00	29,500.00	
	Telephone bill	43,320.00	18,927.00	26,865.00	26,915.00	15,666.00	1,31,693.00	
	Corporation tax	-	2,628.00	-	-	12,178.00	14,806.00	
	Printing & Stationery	2,96,809.00	1,83,746.00	1,74,347.00	28,621.00	86,268.00	7,69,791.00	
	Outreach Programmes	30,519.00	38,577.00	93,461.00	-	-	1,62,557.00	
	Sports & Games	20,140.00	-	-	-	-	20,140.00	
	Audit fees	10,732.00	10,732.00	10,732.00	10,732.00	10,732.00	53,660.00	
	Audit certificate fees including Green Audit	8,000.00	29,500.00	1,000.00	-	65,000.00	1,03,500.00	
	SUB TOTAL	**13,28,884.50**	**7,78,944.40**	**8,55,065.95**	**3,32,656.41**	**4,71,720.06**	**37,67,271.32**	**12.62%**
	Total Expenditure without Salaries	**80,70,043.50**	**1,02,86,848.40**	**68,49,093.95**	**16,55,797.41**	**29,82,434.06**	**2,98,44,217.32**	**100.00%**

R. Mody
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COLLEGE LIBRARY LINK

https://sites.google.com/view/vjrclibrary/

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