Experimental Learning

Practical learning, alternatively referred to as experiential education, represents an instructional method that underscores active involvement in tangible encounters as a pathway to gaining knowledge, competencies, and insight. This approach entails actively immersing learners in occurrences that stimulate discerning analysis, solution-finding, and contemplation. The categorization of practical learning may differ contingent upon the circumstances or structure being employed. A typical grouping is contingent on the extent of arrangement and direction furnished to learners amid the firsthand process. Presented below are three comprehensive divisions of practical learning derived from this categorization:

Systematized Experiential Education: Within this classification, educational encounters are meticulously crafted and organized to attain precise learning objectives. The undertakings, assignments, and settings are pre-established, and learners adhere to a predetermined progression of phases. Instances of methodical experiential learning approaches encompass laboratory trials, simulations, case analyses, and interactive role-playing sessions.
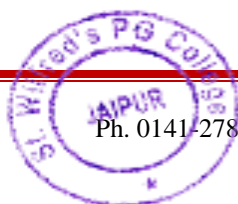
Semi-Organized Experiential Education: Positioned between methodical and unstructured learning methodologies, this grouping maintains a balance. Learners possess a certain level of authority and adaptability in molding their educational occurrences. While a broad structure or aim might exist, learners enjoy greater independence in investigating and unearthing wisdom. Problem-oriented learning, educational excursions, collaborative assignments, and inquiry-driven learning are encompassed within this division.

Open-Ended Experiential Learning: This categorization pertains to educational encounters with reduced guidance and minimal prearranged framework. Learners possess substantial liberty to mold their encounters, delve into their passions, and gather knowledge through experimentation and mistake. Instances encompass internships, apprenticeships, entrepreneurial undertakings, and self-initiated assignments. The emphasis lies in the application within authentic settings and drawing lessons from firsthand involvement.

It's vital to recognize that these categorizations are not rigidly separate, and there can be intersections among them. The fundamental element of experiential learning is the dynamic involvement of learners in substantial encounters, facilitating them to construct wisdom and hone abilities via introspection and implementation.

Experimental learnings are used in our college, listed below-

Department	Experimental Activities Performed
BOTANY	Cell structure from Onion, Hydrilla and Spirogyra
BOTANY	Plastid for pigment distribution in lycopersicon, cassia and capsicum

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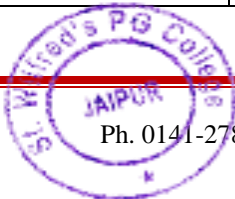Where the mind is without fear! Where the head is held high!!

BOTANY	Electron microphotographs of Eukaryotic cells for various cell organelles
BOTANY	Electron microphotographs Virus, Bacteria and Eukaryotic cell of comparative study of cellular organization
BOTANY	Different stages of Mitosis and Mitosis in root tip cells and flower bud respectively of Onion
BOTANY	Solve genetic problem based upon mendal's law if inheritance: Monohybrid cross, Dihybrid, Back cross and Test cross.
BOTANY	Permanent slide/ Photographs of different stages of Meiosis and Mitosis, Sex chromosome, Polytene Chromosomes, Salivary Glands.
BOTANY	Emusculation, Bagging and Tagging Techniques, Cross Pollination Techniques
BOTANY	Bacteria using curd or any other suitable material, "Gram staining" of Bacteria
BOTANY	Mycoplasma, TMV, Pox Virus, Bacteriophage (Photographs/ 3-D Models).
BOTANY	Symptoms of plants disease- Downy Mildew of Bajra, Green ear of Bajra, Powdery mildew, Mosaic of Bhindi
BOTANY	Specimen, permanent slides and by making suitable temporary slides Albugo-white rust, Schlerospora- downy mildew, green ear, Claviceps Ergot, Ustilago-Loose smut of wheat, covered smut of barley, Puccinia Black rust of Wheat, Agaricus, Peziza and Alternaria- Early blight of potato
BOTANY	Culture techniques of fungi and bacteria.
BOTANY	Media preparation, Potato Dextrose Agar, Nutrient Agar
BOTANY	Visit local gardens/ Field study of plants in farmers field, agricultural station
BOTANY	Classwork material by making temporary slides and study of permanent slides of Oscillatoria, Nostoc, Volvox, Chara, Vaucheria, Ectocarpus, Polysiphonia
BOTANY	External morphology and preparation of suitable section of vegetative and reproductive part of Riccia, Marchentia, Anthoceros and Funaria.
BOTANY	Lichens
BOTANY	Elementry knowledge of principles and uses of various instruments in Molecular biology and Biotechnology- Laminar Air Flow, Centrifuge, autoclave, Incubator, Spectrophotometer, ph meter, Gel electrophoresis unit
BOTANY	Media preparation
BOTANY	Aseptic culture techniques
BOTANY	Explant culture Shoot tip, Nodal segment
BOTANY	Gel electrosis techniques
BOTANY	Separate chloroplast method by solvent method
BOTANY	Separate chloroplast pigment using paper Chromatography
BOTANY	Separate amino acids in a mixture by paper Chromatography
BOTANY	Demonstrate the test of protein in the unknown sample
BOTANY	Demonstrate the phenomenon of osmosis by use of Potato osmometer

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BOTANY	Demonstrate rate of Transpiration by use of potometers
BOTANY	R.Q. by Ganong's Respirometer
BOTANY	Measurement of growth using Auxanometer
BOTANY	External morphology, anatomy of vegetative and reproductive parts of Psilotum, Selaginella, Equisetum and marsillea
BOTANY	External morphology, anatomy of vegetative and reproductive parts of Cycas, Pinus and Ephedra
BOTANY	Fossils and slides of Fossils
BOTANY	Any commonly occurring Dicotyledons plant to understand the Body plan 7 Modul type of growth
BOTANY	Life forms exhibited by flowering plant (by visit to a forest and garden)
BOTANY	Monopodial and Sympodial types of branching in monocot and dicot plants
BOTANY	Anatomy of primary and secondary growth in monocot and dicot using hand out sections of Sunflower, Maize, Cucurbita stem and roots
BOTANY	Anomalous secondary growth in stem; Salvadora, Bignonia, Bougainvillia, Bauhinia, Nyctanthus, leptadenia, Dracena
BOTANY	Examination of Seed (monocot and dicot) Structure, Seed viability Test
BOTANY	Specimen study of medication of plant parts for vegetative reproduction
BOTANY	Frequency and Density, Abundance of plant species of campus vegetation by Quadrate method
BOTANY	Variation in Soil Moisture in relation to depth
BOTANY	The Water Holding Capacity of the soil
BOTANY	Dissolve Oxygen content in polluted and unpolluted water
BOTANY	Find out ph indicator of soil sample by universal indicator method
BOTANY	Find out transparency of a water body by Sachhi Disk
BOTANY	Morphology (external and internal) of hydrophytes (Hydrilla stem, Typha leaf and Nymphea/ Eichhornia petiole) and Xerophytes (Calotropis, Capparis and casuarina stem , Nerium leaf) with special reference to Adaptation
BOTANY	Following specimen with special reference to- Botany of the economically important part Processing if any involved Specimen of Cereals, Pulses, Spices, Beverages, Beans, Sugar, Oil see (mustard and groundnut) Starch grain in Potato and Pea. Histochemical test Cellulose, Lignin, Starch, Fat
BOTANY	Submit 5 specimen of locally importance of Medicinal plant
BOTANY	Study of families- • Ranunculacae- Renunculus, Delphinium • Fabaceae- Pisum sativum, Cassia, Acacia • Apiaceae- Coriandrum • Convolvulaceae- Ipomea, Jacqumontia • Apocynaceae- Catharanthus, Thevetia • Asclepiadaceae- Calotropis • Lamiaceae- Ocimum, Salvia • Euphorbiaceae- Euphorbia pulcherrima, Ricinus • Acanthaceae- Adhatoda • Asteraceae- Helianthus • Rubiaceae- Hamelia • Poaceae- Triticum

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	• Types of Inflorescence and Fruits
BOTANY	Embyology- T.S of Anther, to study the wall layers of Pollen sac with Pollen Grains. Study the various type of Ovule, draw the diagrams. Study the various types of Placentation. Study the Germination of Pollen Grains in situ and observe the path of pollen tube. Study the various stage of Embryo (Raphanus fruit)
BOTANY	To analyse the Ligated sample by Agrose Gel Electrophoresis
BOTANY	Analyse Protein Purity by SDS-PAGE Profile
BOTANY	Isolation of DNA and preparation of "cot" curve
BOTANY	Restriction digestion of plant DNA, its separation by Agrose Electrophoresis and visualization by Ethidium Bromide Staining.
BOTANY	Perform Sandwich Dot ELISA for antigen
BOTANY	General Cytological Techniques- I
BOTANY	General Cytological Techniques- I
BOTANY	Isolate the Crude DNA from Allium cepa
BOTANY	Study the various stages of Mitosis in Onion Root Tipisolate the Crude DNA from Allium cepa
BOTANY	Lampbrush Chromosome
BOTANY	Polytene Chromosome
BOTANY	Disorders- Edward's Syndrome Patau's Syndrome Down's Syndrome Klinefelter's Syndrome Turner's Syndrome Super Males Super Females
BOTANY	Mitotic index in given root tip cells of Onion
BOTANY	Morphological study of respective members of Algae, Fungi, Bacteria, Bryophyte and Pteridophytes.
BOTANY	Algae- Microcystis, Hydrodictyon, Ulva, Cosmarium, Chara and Drapranaldiposis.
BOTANY	Fungi- Pilobolus, Mucor, Albugo, Morchella, Melamspora, Polyporus, Dreshlera, Phoma, Aspergillus and colleotrichum
BOTANY	Bryophytes- Polytrichum, Anthoceros, Marchentia
BOTANY	Pteridophytes- Psilotum, Lycopodium, Selaginella, Equisetum, Ophioglossum, Isoetes and Gleichenia.
BOTANY	Symptomology of some diseased specimens- White rust, Downy Mildew, Rust, Powdery Mildew, Smut, Red Rot of Sugarcane, Citrus Canker, TMV, Little Leaf of Brinjal, Mango Malformation
BOTANY	Gram Staining of Bacteria
BOTANY	Identificaion of Fungal Culture- Rhizopus, Mucor, Aspergillus, Fusarium, Phoma and colleotrichum Sterilization methods, Preparation of media and stains.
BOTANY	Gymnosperm- Comarative study of the anatomy of vegetative and reproductive parts of Cycas, Ginkgo, Cedrus, Abies, Araucaria, Ephedra and Gnetum.
BOTANY	Important Fossil Gymnosperms from prepared slides and specimen
BOTANY	Angiosperms- Description of a specimen from representative, locally available families.
BOTANY	Ranunculaceae (ii) Fabaceae (iii) Apiaceae (iv) Rubiaceae (v) Asteraceae (vi)asclepiadaceae (vi)Apocynaceae (viii)Convolvulaceae (ix) Solanaceae (x)

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	Euphorbiaceae (xi) Labiatae (xii) Chenopodiaceae (xiii) Amaranthaceae (xiv) Cucurbitaceae (xv) Tiliaceae
BOTANY	Description of various species of genus , location of key characters and preparation of key at generic level
BOTANY	Field trip within and around the campus, compilation of field notes and preparation of Herbarium Sheets of such plants Wild or Cultivated as are abundant
BOTANY	Training in using Floras and Herbaria for identification of specimens described in the class
BOTANY	Demonstration of the utility of the Secondary Metabolites in the taxonomy of some appropriate genera
BOTANY	Permeability of living tissues using different concentration of organic solvent
BOTANY	The effect of temperature on permeability of Plasma Membrane
BOTANY	Demonstrate the activity of Peroxidase in plant material
BOTANY	Determine osmotic potential of cell by Plasmolytic method
BOTANY	Measure the rate of Transpiration by using Farmer's potometer
BOTANY	Measure the rate of Transpiration by using Ganong's potometer
BOTANY	Determine RQ value of following Respiratory Substrate using Ganong's Respirometer
BOTANY	Measure and compare rate of respiration of various plant parts by volume methods by Pettinkoff's tube
BOTANY	Extract free Amino Acid from germinating seeds by using Chromatography anf RF Value
BOTANY	Separate Amino Acid in a mixture by paper strip chromatography
BOTANY	Separate the leaf pigment by paper strip chromatography
BOTANY	Separate the chlorophyll pigment by using thin layer chromatography
BOTANY	Carbohydrate (Reducing sugar) Carbohydrate (non-reducing sugar)
BOTANY	Color test for lipid
BOTANY	Test the presence of cellulose
BOTANY	Test presence of latex
BOTANY	Test the presence of Hemi-cellulose
BOTANY	Presence of Phenol
BOTANY	Determine the action of Catalase
BOTANY	Test the presence of cutin
BOTANY	Basic requirement of microbiological laboratory
BOTANY	Basic preparation of various culture media
BOTANY	Techniques for pure culture of microorganism
BOTANY	Isolation of antibiotic resistant colonies by antibiotic disc methods gradient plate and replicate plating technique.
BOTANY	Identification of Bacterial and fungal culture
BOTANY	Green ear diseaseof bajra
BOTANY	Ergot of Bajra
BOTANY	White Rust of Crucifers

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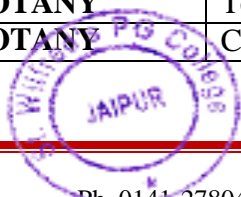Where the mind is without fear! Where the head is held high!!

BOTANY	Black stem rust of Wheat
BOTANY	Paddy blast disease
BOTANY	Citrus Canker
BOTANY	Bacterial blight of Rice
BOTANY	Rust wart of Sugarcane
BOTANY	Loose smut of Wheat
BOTANY	Root –Knot of Vegetables
BOTANY	Pollen viability in the given flower
BOTANY	The slides showing T.S. of Anther
BOTANY	Pollen grains of some common plants
BOTANY	Determine rate of carbon dioxide Evalution from different soils using Soda Lime or Alkali absorption method
BOTANY	Determine percent of Organic Carbon and Organic matter in the soils of crop and Grassland and Forest
BOTANY	Determine the Water holding Capacity of soils collected from different location
BOTANY	Determine Soil Moisture Content Porosity and Bulk Density of soils collected from varying depths at different locations
BOTANY	Determine Gross and Net Phytoplankton productivity by light and dark bottle method
BOTANY	Determine minimum size and number of Quardates required for reliable estimate of biomass in Grassland
BOTANY	The L.S. Of shoot tip for Cytohistological
BOTANY	Various types of ovules
BOTANY	The pollen grains of some Dicotyledonous plants
BOTANY	Different type of stomata in Monocot and Dicot leaves
BOTANY	The pollen grains of some plants belonging Monocotyledons
BOTANY	Hanging drop methods of pollen germination
BOTANY	The development stages of stometa
BOTANY	Pollen vibility by histochemical test in Laboratory
BOTANY	Endospore
BOTANY	Pollen vibility by histochemical test in Laboratory
BOTANY	Section cutting dicot root (Tinospora)
BOTANY	Monocot embryo
BOTANY	Dicot stem (Sunflower)
BOTANY	Monocot root (Maize)
BOTANY	Monocot stem (Maize)
BOTANY	Leaf anatomy (Neerium , Ficus, Triticum, Zea mays)
BOTANY	Food Crops: Wheat, Rice, Maize, Chickpea, Potato, Sugarcane, Sweet potato, Morphology, Anatomy and Microchemical test for stored food material.
BOTANY	Forage/ Fodder Crops- Sorghum, Bajra, Gram, Clove, Guar Bean
BOTANY	Textile Fibers: Cotton, Jute, Cannabis, Linen, Sunn hemp
BOTANY	Cordage fibers: Coir

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BOTANY	Fibre for stuffing: Silk, Cotton
BOTANY	Morphology, Anatomy, Microscopic study of whole fibres using appropriate staining procedures
BOTANY	Medicinal and Aromatic Plants: Papaver somniferum, Withania somnifera, Allium sativum, Adhatoda ceylanica, Aloe barbadens
BOTANY	Vegetable Oils- Mustard, Ground nut, Sunflower, Castor. Morphology, Microscopic structure of oil yielding tisses, test of oil and iodine number Gum, Resin, Tenins and Dye- Perform simple test for Gum or Resin. Prepare a water extract of Vegetable tanins(Acacia Terminalia, tea) and dyes (turmeric, indigo, Butea monosperma, Lawsonia inermis) and perform tests to understand their chemical nature
BOTANY	Field Survey- A survey of a part of the town or city should be carried out by the entire class in batch. Individual students will select one avenue road and locate the tree planted on a graph paper
BOTANY	Scientific Survey- The student should be taken to National park and century
BOTANY	Elementry knowledge of principles and uses of various instruments in Biotechnology- Laminar Air Flow, Centrifuge, autoclave, Incubator, Spectrophotometer, ph meter, Gel electrophoresis unit
BOTANY	Aseptic culture techniques
BOTANY	Explant culture Shoot tip, Nodal segment
BOTANY	Gel electrosis techniques
BOTANY	Media preparation
BOTANY	Organogenesis and Somatic Embryogenesis using appropriate Explant and preparation of Artificial Seeds
BOTANY	Demonstration of androgenesis in Datura
BOTANY	Salinity of soil sample
BOTANY	Find out Stomatal index of xerophyte (Calotropis, Nerium and Zizyphus)
BOTANY	To study ecological adaptation of Halophytes
BOTANY	Seed viability by T.T.C method
BOTANY	To study spread of root system of a perennial species in the soil
BOTANY	To estimate ph, EC and Sacchi Disk transparency for polluted and unpolluted water bodies
BOTANY	To estimate chemical oxygen demand of polluted water sample
BOTANY	To estimate Biological oxygen demand of polluted water sample
BOTANY	To estimate chemical oxygen demand of polluted water sample
BOTANY	To estimate inorganic phosphorus content in water sample collected from polluted and unpolluted water bodies
BOTANY	To estimate total hardness, calcium and magnesium content in water sample collected from polluted and unpolluted water bodies
BOTANY	To estimate chloride content in water sample collected from polluted and unpolluted water bodies
BOTANY	To estimate alkalinity in water sample collected from polluted and unpolluted water bodies
CHEMISTRY	Separation and identification of 6 radicals (3 cations and 3 anions) in the given inorganic mixture. [anion-Cl^-,NO_3^-,SO_4^{2-} & cation– Fe^{+3} ,Mn^{+2} ,Ca^{+2}]

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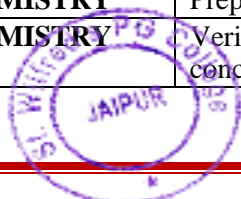Where the mind is without fear! Where the head is held high!!

CHEMISTRY	Separation and identification of 6 radicals (3 cations and 3 anions) in the given inorganic mixture [anion-CO_3^{-2} ,Br^- ,SO_4^{-2} & Cation - Zn^{+2} ,Ba^{+2},Mg^{+2}]
CHEMISTRY	Separation and identification of 6 radicals (3 cations and 3 anions) in the given inorganic mixture. [anion-$CH3COO^-$,Cl^-,SO_4^{-2} & cation-Cu^{+2} ,Al^{+3} ,Mg^{+2}]
CHEMISTRY	Separation and identification of 6 radicals (3 cations and 3 anions) in the given Inorganic mixture. [anion-NO_2^-,Br^-,CO_3^{-2} & cation-Cd^{+2},Sr^{+2},Mg^{+2}]
CHEMISTRY	Determination of melting point of given organic compound
CHEMISTRY	Purify and crystallize the given organic compound by sublimation method
CHEMISTRY	Determine the boiling point of the given organic compound
CHEMISTRY	Carboxylic group ,carbonyl group,Alcoholic group,Nitro group,Aldehydic group, Hydrocarbon,Carbohydrate,Amido group,Amino group,Ester group,Ether group
CHEMISTRY	To determine the viscosity of pure liquid at room temperature by using Ostwald viscometer
CHEMISTRY	To determine the surface tension of pure liquid at room temperature by using stalagmometer
CHEMISTRY	Estimation of hardness of water by EDTA using Eriochrom black-T indicator
CHEMISTRY	To find the amount of copper in the impure sample of copper sulphate using sodium thiosulphate (Hypo)
CHEMISTRY	Estimation of Nickel as Nickel dimethylglyoxime gravimetrically
CHEMISTRY	Identification of organic compound through the functional group analysis, determination of melting point , boiling point and preparation of suitable derivatives
CHEMISTRY	Oxalic acid ,Resorcinol,Alpha Naphthol, Beta Naphtol,Benzophenone,Acetone, Urea,Aniline,Nitro benzene,Acetamide, Glucose,Benzamide,Naphthalene, Thin layer chromatography, Separation of green leaf pigments using spinach leaves
CHEMISTRY	Determination of transition temperature of Manganese chloride tetrahydrate by thermometric method.
CHEMISTRY	Determination of critical solution temperature of two partially miscible liquids and to determine the concentration of that solute . (Phenol-Water system)
CHEMISTRY	Separation and identification of organic compound By using Sodium bicarbonate as solvent:- (Anthracene and benzoic acid)
CHEMISTRY	Preparation of cis-potassium diaqua dioxalato chromate (III) ion
CHEMISTRY	Preparation of sodium trioxalato ferrate (III) Ion
CHEMISTRY	Separation and identification of organic compound By using Sodium Hydroxide as solvent (Anthracene and b-Napthol)
CHEMISTRY	Separation and identification of organic compound By using Water as solvent:- (Alpha Nephthol and Oxalic acid)
CHEMISTRY	Separation and identification of organic compound by using Water as solvent (Benzophenone and urea)
CHEMISTRY	Preparation of p-nitroacetanilide from acetanilide
CHEMISTRY	Preparation of iodoform from ethanol and acetone
CHEMISTRY	Verify the Beer-Lambert law for potassium permanganate and determine the concentration of unknown given solution of $KmNO_4$ using spectrophotometer

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CHEMISTRY	Determine the strength of given strong acid (Hcl) conductometrically by using standard strong alkali solution (NaOH) by using conductivity meter
CHEMISTRY	Determine the strength of given strong acid (Hcl) potentiometrically using standard strong alkali solution (NaOH) by ph metre
CHEMISTRY	To prepare Tetra amine CU(II) sulphate [$CU(NH_3)]SO_4.H_2O$]
CHEMISTRY	To prepare Bis- Dimethyl glyoxime Nickel [$Ni(DMG)_2$]
CHEMISTRY	To prepare trans -potassium trioxalato Chromate(III).$K_3[Cr(C_2O_4)_3].3H_2O$
CHEMISTRY	Preparation of sodium trioxalato feric(III)
CHEMISTRY	Preparation of Cis-Potassium diaqua dioxalato chromate(III) Ion $K_3[Cr(C_2O_4)_2(H_2O)_2]$
CHEMISTRY	To identify the 4 anion and 4 cation including rare Earth Elements [anion-CO_3^{2-},CH_3COO^-,Cl^-,NO_3^{2-} & cation-NH^{4+},Pb^{+2},Ni^{+2},Cd^{+2}]
CHEMISTRY	To determine anion/acidic radical and cation/basic radical from the mixture. [anion-CO_3^{2-},CH_3COO^-,NO_3^-,Cl^- & cation- NH_4^+,Cu^{2+},Zn^{+2},Zr^{+2}]
CHEMISTRY	Separation and identification of organic compound by using water as solvent :- (Urea and beta Naphthol)
CHEMISTRY	Separation and identification of organic compound by using Sodium bicarbonate as solvent :-(Benzoic Acid Anthracene)
CHEMISTRY	Separation and identification of organic compound by using Sodium Hydroxide (NaOH) as solvent :-(Anthracene and beta Naphthol)
CHEMISTRY	Separation and identification of organic compound by using water as solvent :- (beta Naphthol and Benzoic Acid)
CHEMISTRY	Separation and identification of organic compound by using water as solvent :- (Starch and Oxalic acid)
CHEMISTRY	Preparation of Benzylic Acid from Benzoin.
CHEMISTRY	To prepare Dibenzyl Acetone from Benzaldehyde
CHEMISTRY	Preparation of Benzanilide from Aniline
CHEMISTRY	To determine the strength of unknown solution of strong acid by titrating it against strong base and then prepare 0.1 N solution of hcl by dilution.
CHEMISTRY	To determine the strength of unknown solution of a strong acid (HCl) by titrating it against standard strong base (NaOH) conductometrically.
CHEMISTRY	To obtain phase diagram of Water , Acetic Acid and Chloroform.
CHEMISTRY	To obtain phase diagram of Water Acetic Acid and Benzene.
CHEMISTRY	To determine the strength of unknown solution of a strong acid (HCl) solution by titrating it against standard strong base (NaOH) potentiometrically using ph-meter.
CHEMISTRY	Investigate the adsorption of oxalic acid for aqueous solution by activated charcoal and examine the validity of classical and langmuir adsorption isotherm.
CHEMISTRY	To determine the strength of unknown solution of a weak acid (Acetic Acid) solution by titrating it against standard strong base (NaOH) conductometrically using conductivity meter.
CHEMISTRY	Investigate the adsorption of Acetic Acid for aqueous solution by activated charcoal and examine the validity of classical and langmuir adsorption isotherm.
CHEMISTRY	To determine the strength of unknown solution of a strong acid (HCl) solution by titrating it against standard weak base (Ammonium Hydroxide) potentiometrically using ph-meter

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CHEMISTRY	To prepare tri-acetylacetonato chromium (III)Complex and study its IR spectra.
CHEMISTRY	To prepare Sodium dioxalatocuprate (II) Complex and study its IR spectra.
CHEMISTRY	Estimation of Cu and Ni by Gravimetric method
CHEMISTRY	Estimation of Cu and Zn by Gravimetric method
CHEMISTRY	To study paper chromatographic separation of Ni(II),Co(II) and Zn(II) ions
CHEMISTRY	Determine the maximum wavelength for formation of complex in between Fe(III) and thiocynate ion by job's method
CHEMISTRY	Qualitative Analysis :- Separation , Purification and Identification of components of Three organic compounds (three solids, or two liquid and one solid, or two solid and one liquid) using, checking the purity of the separated compounds by chemical analysis. Oxalic acid, Starch and m-dinitrobenzene Acetaldehyde ,Anthracene and Oxalic acid Ethyl Acetate , Glucose and Beta-nephthol Urea , Naphthalene and beta-Naphthol Starch , Aniline and Bromine
CHEMISTRY	Organic Synthesis :- Preparation of Benzylic Acid from Benzoin. Preparation of Benzophenole from Benzophenone by thermal method
CHEMISTRY	Extraction of organic compounds from Natural sources:- Isolation of Casein from milk (by typical colour reactions of proteins). Isolation of Lactose from Milk.
CHEMISTRY	Paper Chromatography :- Separation and Identification of the Sugars present in the given mixture of Glucose, Fructose ,and Sucrose by Paper Chromatography and determination of Rf-values.
CHEMISTRY	Spectroscopy :- Determine the organic compound with a molecular formula from the given spectra. N-hexanol 2-Pentanone Pentanoic Acid Pentanal Malonic Ester
CHEMISTRY	Proton NMR :- Identify a compound by analysis of H-NMR spectrum and determination of number of equivalent Proton at each signal. 1,2-dibromo-2-methylpropane Benzyl Alcohol P-tertiarybutyltoluene
CHEMISTRY	To verify Beer's law for aqueous solution of Potassium Permanganate and determine the concentration of unknown aqueous solution of the same spectrophotometrically.
CHEMISTRY	To verify Beer's law for acidic solution of Potassium Permanganate and determine the concentration of unknown acidic solution of the same spectrophotometrically
CHEMISTRY	Titrate ph-metrically Phosphoric acid solution against alkali solution of sodium hydroxide calculate first , second and third ionization constant of the acid

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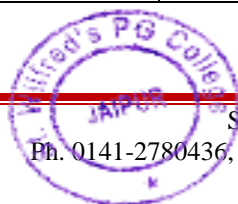Where the mind is without fear! Where the head is held high!!

CHEMISTRY	Study the Kinetics of bleaching of malachite Green by Basic medium (NaOH) spectrophotometrically and calculate it's rate constant
CHEMISTRY	Determine the maximum wavelength for formation of complex between Fe(III) and thiocyanate Ion by Job's method
CHEMISTRY	To determine the stability constant of Iron Thiocyanate Complex Ion, keeping ionic strength constant by the addition of salt sodium nitrate
CHEMISTRY	To determine the stability constant of Iron Thiocyanate Complex iron keeping ionic strength constant by Job's method with variation of concentration of sodium nitrate salt
CHEMISTRY	To determine the ph of the solution employing methyl orange indicator spectrophotometrically
PHYSICS	The variation of power transfer to different loads by a D. C. Source and to verify maximum power transfer theorem
PHYSICS	The variation of charge and current in a RC circuits with different time constant using a D. C. Source (charging and discharging characteristic)
PHYSICS	Behavior of R-C circuit with varying resistance and capacitance using AC mains as a power source and also to determine the impedance and phase relations
PHYSICS	The voltage and current behavior of an L-R circuit with an alternating current (A. C.) Power source and also determine impedance, phase relation and power factor
PHYSICS	The forward and reverse bias characteristics of a semiconductor junction diode and to determine its forward & reverse bias resistances (static and dynamic)
PHYSICS	To determine the specific resistance of material and determine difference between two small resistance using Carry-Foster's Bridge
PHYSICS	To convert Galvanometer into Ammeter of given range (1A)
PHYSICS	To convert Galvanometer into Voltmeter of given range (1V)
PHYSICS	Plot the forward and reverse bias characteristics of a Zener diode and to determine forward and reverse resistance (static and dynamic) also show the breakdown characteristics
PHYSICS	The Random Decay phenomena and determine the decay constant using the statistical board
PHYSICS	Using Compound Pendulum study the variation of time period with amplitude in large angle oscillations
PHYSICS	The excitation of normal modes and measure frequency splitting using two coupled oscillators
PHYSICS	The frequency of energy transfer as a function of coupling strength using coupled oscillators
PHYSICS	Normal modes of a coupled pendulum system. Study of oscillations in mixed modes and find the period of energy exchange between the two oscillators.
PHYSICS	Determine Youngs Modulas by bending of beam
PHYSICS	To ensure Curie temperature of Monal alloy using Curie temperature kit.

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PHYSICS	Determine the modulus of rigidity (η) of material of wire using Maxwell`s needle method.
PHYSICS	The specific-rotation of sugar solution by polarimeter.
PHYSICS	Verify the laws of series and parallel combination of resistances in an electrical circuit
PHYSICS	Using Micheloson's interferometer find out the wavelength of given monochromatic source (Sodium Light).
PHYSICS	Determine the dispersive power of a prism by spectrometer.
PHYSICS	Determine the wave-length of sodium light using transmission grating.
PHYSICS	Study and verify Thevenin`s Theorem.
PHYSICS	Study and verify different theorems of Boolean Algebra.
PHYSICS	Study the operation and characteristics of OR, AND, NOT, NOR, NAND, X-OR, X-NOR Logic gates.
PHYSICS	The full wave rectifier (power supply) using two diodes and application of
	L and π section filters.
PHYSICS	The half wave rectifier using single diode and application of L and π section filters.
PHYSICS	Input and output characteristics of a given PNP\NPN transistor in common emitter mode.
PHYSICS	Study input and output characteristics a given of PNP\NPN transistor in common base mode.
PHYSICS	Determine the band gap of a Semiconductor P-N junction diode.
PHYSICS	To design & study of single stage transistor audio amplifier (variation of gain with frequency).
PHYSICS	To determine the capacitance and dielectric constant of a liquid and gang condenser using De-Sauty bridge.
PHYSICS	To determine the h-parameters of a given PNP/NPN transistor.
PHYSICS	Determination of power factor ($\cos \theta$) of a given coil using CRO.
PHYSICS	Determination of velocity of sound in air by standing wave method using speaker, microwave & CRO.
PHYSICS	Measurement of inductance of a coil by Andeson's bridge.
PHYSICS	To determine the Plank's Constant using Solar Cell.
PHYSICS	Study of the temperature dependence of resistance of a semiconductor and determine band gap using Four Probe method.
PHYSICS	To study the variations of count rate with applied voltage and thereby determine the *platue*, operating voltage and slope of platue.
PHYSICS	Study of characteristics of a G. M. Counter, verify inverse square law for β particles in air and calculate the gradient of the slope.
PHYSICS	Study of β absorption in Al foils, calculate linear attenuation coefficient using G. M. counter.
PHYSICS	Determination of Plank's constant using Light Emitting Diode (LED).

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PHYSICS	To study behavior of L-R circuit using alternative current (A. C.) source and hence to determine impedance of the circuit, phase relation, power factor of the circuit.
PHYSICS	To study the operation and characteristics of BCD to 7-segment decoder.
PHYSICS	Study of LC transmission line at fixed frequency.
PHYSICS	Study of LC transmission line at Variable frequency.
PHYSICS	To study the frequency response characteristics of series resonance circuit (L-C-R), prove relation between frequency, inductance and capacitance.
PHYSICS	To study and plot the forward and reverse bias characteristics of a Zener diode and to determine forward and reverse resistance also show the breakdown characteristics.
PHYSICS	To study and plot the forward and reverse bias characteristics of a semiconductor/junction diode and determine forward and reverse bias resistances.
PHYSICS	To design Zener regulated power supply and study the regulation with various loads.
PHYSICS	To study the characteristics of Field Effect Transistor (FET) and design/study of finite gain & operational constants.
PHYSICS	To study the frequency response of single stage transistor amplifier.
PHYSICS	To study the operation of OR, AND, NOT, NOR, NAND, X-OR and X-NOR logic gates.
PHYSICS	To study the characteristics of operational amplifier (Op-amp) as Inverting amplifier, Non-inverting amplifier.
PHYSICS	Obtained differential amplifier (subtractor) and summing amplifier using operational amplifier.
PHYSICS	To design and study of single stage transistor amplifier and determine its voltage gain, cut-off frequency and frequency response (variation of gain with frequency).
PHYSICS	To design and study the frequency response of two stage R-C coupled transistor amplifier & determine its input, output impedance and voltage gain.
PHYSICS	To study the transistor bias stability hence obtained effect of temperature on leakage current variation and stability of amplifier.
PHYSICS	To design and study the operation of astable, monostable and bistable multivibrator with different values of RC (time-constant).
PHYSICS	To Study the characteristics of FET, use it to design relaxation oscillator hence measure its frequency, mutual conductance, amplification factor and operational constants.
PHYSICS	To study the characteristics of operational amplifier (OP-Amp) as Inverting amplifier and Non-inverting amplifier.
PHYSICS	Obtained buffer amplifier (voltage follower \ unit gain amplifier), Differential amplifier (subtractor), Summing amplifier, Differentiator and Integrator using operation amplifier.
PHYSICS	To design and study the percentage regulation and variation on ripple-factor for full wave rectifier, shunt capacitor filters, L and π filters.

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PHYSICS	To design and study of various pass filters (Low pass, High pass, Band pass, Band stop filters) calculate the frequency and compare with experimental values.
PHYSICS	To study the percentage regulation and variation on ripple-factor for half wave rectifier, shunt capacitor filters, L and π filters.
PHYSICS	To study the frequency response of non-inverting AC operational amplifier and high input impedance of inverting amplifier & non-inverting amplifier.
PHYSICS	To study the clamping and clipping of sine- wave and square-wave using diode circuit.
PHYSICS	To study the characteristics of Unipolar junction transistor (UJT), use it to design relaxation oscillator and measure its frequency.
PHYSICS	To determine the Plank`s constant using Solar cell.
PHYSICS	To study the regulated power supply (voltage stabilization) using Zener diode.
PHYSICS	To design the conversion of analog voltage to digital signal and digital signal to analog voltage hence compare the theoretical and experimental values.
PHYSICS	To Study the Michelson Interferometer.
PHYSICS	To Determination of the variation of refractive index of the material of the Prism with wave-length and to verify Cauchy's dispersion formula
PHYSICS	To study the DC-gate control characteristics and anode current characteristics of silicon control rectifier (SCR)
PHYSICS	To study J-K flip-flop and master slave J-K flip-flop hence verify their truth table.
PHYSICS	To study digital signal addition and subtraction using 4-bit full adder and subtract.
PHYSICS	To study D flip-flop and T flip-flop hence verify their truth table.
PHYSICS	To study the operation and characteristics of BCD to 7-segment decoder
PHYSICS	To study the operation of decade counter using IC-7490 and binary to decimal decoder/driver using IC-7490
PHYSICS	To study the absorption of particles using Aluminum (Al) foils and determine linear attenuation coefficient, mass attenuation coefficient and half thickness.
PHYSICS	To study the characteristics of GM counter, study the statistical nature of radioactive decay and calculate mean variance and standard deviation decay.
PHYSICS	To study and verify inverse square law for β - particles in air.
PHYSICS	To illustrate that if no of measurements are quite high, the Poison distribution in nuclear decay phenomena fellows closely normal and Gaussian distribution.
PHYSICS	To study the variations of count rate with applied voltage and there by determine the operating voltage, plateau and slope of plateau.
PHYSICS	To study the mode characteristics of reflex klystron and determine mode number, transit time, electronic tuning range (E.T.R.) & electronic tuning sensitivity (E.T.S.)

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PHYSICS	To study the frequency characteristics of reflex klystron hence determine its frequency and compare with theoretical value.
PHYSICS	To determine the voltage standing wave ratio using basic technique of microwave measurement, also compute VSWR.
PHYSICS	To study the attenuation characteristics of variable attenuator using microwave bench.
PHYSICS	To study the simulated L-C-R transmission line (audio frequency) and to find out the value of frequency & impedance (Z_0) from graph.
PHYSICS	To study the variation of resistivity with temperature of a given semi conductor material and obtain its band gap using Four Probe method.
PHYSICS	To study the Hall effect in a given semi conductor material and determine its Hall coefficient, carrier density and Mobility.
PHYSICS	To study of the dispersion relation for the mono-atomic lattice. Determination of cut off frequency of the mono-atomic lattice.
PHYSICS	To study of the dispersion relation for the di-atomic lattice, acoustical and optical mode, energy gap.
PHYSICS	Study of heat capacity of solids.
PHYSICS	Determination of the variation of refractive index of the material of the Prism with wave-length and to verify Cauchy's dispersion formula.
PHYSICS	To study the operation and characteristics of 1:16 multiplexer and 16:1 de-multiplexer hence verify their truth table.
PHYSICS	To demonstrate the use of 555 timing IC to design astable, monostable and bistable multivibrators and voltage to frequency converter.
ZOOLOGY	Optical Microscope: Dissecting and compound microscopes
ZOOLOGY	microscopic slide preparations: Narcotization; fixing and Preservation; washing; staining; destaining; dehydration; clearing and mounting.
ZOOLOGY	Collection of animals from their natural habitat during field trips such as Amoeba, Paramecium, Euglena, Daphnia, Cyclops, etc.
ZOOLOGY	Culture of Paramecium in the laboratory and study of its structure, life-Processes and behavior in live state.
ZOOLOGY	Protozoa: Amoeba, Euglena Trypanosoma, Giardia, Entamoeba. Elphidium (Polystomella), Foraminiferous shells, Monocystis, Plasmodium, Paramecium, leishmania, Paramecium showing binary fission and conjugation, Opalina, Nyctotherus, Balantidium, Vorticella.
ZOOLOGY	Porifera: Leucosolenia, Euplectella, Spongilla, T. S. Sycon, Spicules, Spongin fibers, Gemmules. Coelenterata :Millepora, Physalia, Velella, Aurelia, Alcyonium, Gorgonia, Pennatula, Sea anemone, Stone corals, Obelia colony and medusa.
ZOOLOGY	Ctenophora: Any Ctenophore
ZOOLOGY	Platyhelminthes: Taenia, Planaria Fasciola (WM), T. S. body of Fasciola, Miracidium, Sporocyst, Redia and CercariaLarvae of Fasciola, Scolex, T. S. mature proglottid of Taenia, gravid Proglottid, Cysticercus larva.
ZOOLOGY	Aschelminthes : Ascaris, Wuchereria, Dracunculus

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ZOOLOGY	Annelida: Neries, Heteroneries, Arenicola, Aphrodite, Chaetopterus, Tubifix, Glossiphonia, Pontobdella, Polygordius.
ZOOLOGY	Earthworm: External features, general viscera, alimentary canal, reproductive system and nervous system.
ZOOLOGY	Leech: External features, alimentary canal, reproductive and nervous system.
ZOOLOGY	Study of the Following Through Permanent Slide Preparation: Paramecium, Euglena, Foraminiferous shells, Sponge spicules, Spongin fibres, Gemmule, Hydra Obelia colony and Medusa: Parapodium of Nereis and Heteronereis.
ZOOLOGY	Squash preparation for the study of mitosis in onion root tip, permanent slides of mitosis (all stages).
ZOOLOGY	Squash preparation for the study of meiosis in grasshopper or cockroach testes, permanent slice of meiosis (all stages).
ZOOLOGY	Study of giant chromosomes in salivary glands of Chironomous or Drosophila larva.
ZOOLOGY	Study of cell permeability using mammalian R.B.C.
ZOOLOGY	Study of Drosophila: 1. Life cycle and an idea about its culture 2. Identification of male and female 3. Identification of wild and mutants (yellow body, ebony, vestigial wing and white eye) 4. Study of permanent prepared slides: Sex comb and salivary gland chromosomes.
ZOOLOGY	Numerical problems based on monohybrid and dihybrid cross
ZOOLOGY	Identification of blood groups (A, B, AB, O & Rh factor)
ZOOLOGY	Study of development of frog/toad with the help of Charts/Slides/Models Eggs, cleavage, blastula, gastrula, neurula, tail-bud, hatching, mature tadpole Larvae, metamorphic stages, toadlet/froglet
ZOOLOGY	Histological slides: Cleavage, blastula, gastrula, neurula and tail-bud stage.
ZOOLOGY	Study of development of chick with the help of whole Mounts/Charts/Slides/Models a. 18 hrs, 21 hrs, 24 hrs, 33 hrs, 48 hrs, 72 hrs and 96 hrs of incubation. b. Primitive streak stage in living embryo, if possible, after removal of the blastoderm from the egg. c. Study of the embryo at various stages of incubation in vivo by making a window in the egg-shell may also be demonstrated. Study of various foetal membranes in a 10-12 day old chick embryo.

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ZOOLOGY	Study of Museum Specimens: Onychophora- Peripatus, Arthropoda - Limulus, Spider, Scorpion, Centipede, Millipede, Lepas, Balanus, Squilla, Eupagurus, Crab, Mantis, Honey-bee, (queen, king, worker) Locust, Silkworm Moth, Beetle, White grub. Mollusca -Chiton, Aplysia, Cypraea, Mytilus, Pearl Oyster,Denialium, Loligo, Nautilus. Echinodermata- Pentaceros, Cucumaria, Antendon. Echinus, Ophiothrix, Hemichordata - Balanoglossus
ZOOLOGY	Study of Microscopic Slides: Arthropoda V.S. of integument (cuticle): Pediculus, Bedbug, Termite and its castes, Cyclops, Daphnia, crustacean larvae (Nauplius, Metanauplius, Zoea, Mysis, Megalopa, Phyllosoma), statocyst of prawn. Mollusca V.S. of shell, T.S. gill of Pila, T.S of gill of Unio, Glochidium larva. Echinodermata- Larval forms
ZOOLOGY	Anatomy: Prawn/Squilla External features, appendages, alimentary canal and nervous system; Hastate Plate Pila External features, pallial organs and nervous system; osphradium, radula.
ZOOLOGY	Study of the Following through Permanent Slide Preparation: (i) Study of different cell types -Blood smears (Wrights or Leishman stain). (ii) Ospharadium, gill lamella and radula of pila. (iii) Statocyst and Hastate plate of Prawn/Squilla
ZOOLOGY	Microbiology Immunology and Biotechnology:
	1. Preparation and use of culture media for microbes. 2. Study of microbes in food materials like curd,etc (Gram +ve& Gram-ve bacteria, Aspergilius, Mucor, Rhizopus, Penicillium, Alternaria and Fusarium). 3. Educational tour to any Microbiology laboratory/ Dairy/ Food processing factory/ Distillery. Collection of material may also be encouraged wherever possible. Candidates are required to submit a detailed report of the visit. 4. Antigen-antibody reactions-precipitation, agglutination.

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ZOOLOGY	Animal Physiology: 1. Counting of red and white blood cells in the given blood sample. 2. Estimation of hemoglobin in the given blood sample. 3. Estimation of haematocrit value (PCV) in the given blood sample. 4. Demonstration of enzyme activity (catalase) in liver. 5. Study of salivary digestion of starch and the effect of heat and alcohol on salivary Digestion of starch. 6. Study of histological structure of major endocrine glands of mammals.
ZOOLOGY	Biochemistry: A. Detection of protein, carbohydrate and lipid in the animal tissue/food samples. B. Identification of different kinds of mona-, di- and poly-saccharide in the given Food samples. C. Circular Paper chromatography of dyes/amino acids.
ZOOLOGY	Anatomy: Any edible fish (Wallago, Labeo): External features, general viscera, afferent and efferent branchial blood vessels, eye muscles and their innervations, brain, cranial nerves and internal ear.
ZOOLOGY	Study of the following through Permanent Slide preparations: Striped muscle fibers; Smooth muscle fibers, scales of edible fish, hair of man, blood film of any vertebrate.
ZOOLOGY	Study of Microscopic Slides: Whole mounts of oral hood, velum and pharyngeal wall of Amphioxus; T. S. of Amphioxus through various regions; tadpole larva of Ascidia, whole mounts of Salpa, Doliolum and Oikopleura, V. S. of skin of fish, T. S. body of fish through various regions, V. S. of skin of bird, V. S. mammalian skin, T. S. mammalian liver, kidney, stomach, intestine, bone, spinal cord, lung, duodenum, pancreas, testis and ovary.
ZOOLOGY	Study of Museum Specimens: Ascidia, Ciona, Botryllus, Ammocoete larva, Petromyzon, Myxine or Bdellostoma, Zygaena (Sphyrna), Torpedo, Chimaera, Acipenser, Amia or Lepidosteus, Labeo, Clarias, Anguilla, Hippocampus, Exocoetus, Echeneis, any flat-fish, Protopterus, Icthyophis or any blind-worm, Proteus, Ambystoma, Axolotl, Siren. Alytes, Hyla, Testudo, Chelone, and Fresh Water Tortoise, Sphenodon, Hemidactylus Phrynosoma, Draco, Chameleon; Eryx, Hydrophis, Naja, Viper, Crocodilus, Alligator, Archaeopteryx, any Running Bird, Pavo cristatus, Choriotis nigriceps, Ornithorhynchus, Tachyglossus, Didelphys, Macropus, Bat, Loris, Scaly anteater.
ZOOLOGY	Osteology: A comparative study of articulated and disarticulated bones of skull, vertebrae, limb bones and girdles of any amphibian, reptile, bird and mammal with the help of models/charts/artificial skeleton/bones.

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ZOOLOGY	Environmental Biology: Analysis of Environment: 1. Soil pH 2. Water analysis: pH, alkalinity, acidity, dissolved O_2 and free CO_2, Salinity (Chloride). 3. Qualitative estimation of zoo-plankton in given sample of water.
ZOOLOGY	Ethology: 1. Study of any stored insect pest (food preference and response to light) 2. Antennal grooming in cockroach. 3. Chemical communication: Ants/earthworm.
ZOOLOGY	Biostatistics: 1. Construction of frequency table, bar diagram, line diagram, histogram, frequency Polygon and pie chart. 2. Exercises on mean, median and mode (direct, short-cut and step-deviation Methods). 3. Standard deviation and standard error.
ZOOLOGY	Biosystematics and Taxonomy: 1. Identification, Classification and study of the animals from major invertebrate Group (Protozoa to Hemichordate including minor phyla) using museum Specimens, microscopic slides, models or charts or photographs. 2. Problems based on Shannon weiner index, Dominance index. Estimation of Population density of given sample by Mark recognition recapture method. Determination of population density by quadrate method.

ZOOLOGY	Anatomy:
	 a. Major:
	   1. Leech:Reproductive, excretory, nervous and haemocoelomic system
	   2. Crab: Nervous system.
	   3. Scorpion: Nervous and reproductive systems.
	   4. Mollusca: General anatomy and Nervous systems of Patella,Lamelli
	   5. Mytilus, Sepia andAplysia.
	 b. Minor:
	   6. C.S. of arm of Starfish.
	   7. General anatomy of Holothurians.
	   8. Aristotle's lantern of Sea urchin.

ZOOLOGY	Museum Specimens: Identification, classification and distinguishing features of important representatives from various groups (Protozoa to Hemichordata).

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ZOOLOGY	Study of Permanent Preparations (Protozoa toHemichordata): Amoeba, Entamoeba, Polystomella, Actinophryx, Euglena, Noctiluca, Volvox colony, Trypanosoma, Giardia, Opalina, Nyciotherus, Balantidium, Vorticella, Monocystis, Plasmodium, SyconT.S. and L.S.,Gemmule, Obelia colony, Obelia medusa, Aurelia tentaculocytes, T.S. Fasciola hepatica sectionsthrough variousregionsof the body, Hirundinaria body sections through various regions, Daphnia, Cypris, Cyclops, T.S. Peripatus. Larva: Aurelia-planula, Redia, Cercaria, Metacercaria, Onchosphere, Cysticercus, Trochophore, Nauplius,Zoea, Mysis, MegalopaPhyllosoma, Veliger, Glochidium, Bipinnaria, Ophioplutcus, Echinopluteus, Auricularia, Tomaria.
ZOOLOGY	.Biological Chemistry: I. Verification of Beer-Lambert's Law. II. Quantitative estimation of the following in various tissues: a) Carbohydrates: Glycogen, glucose. b) Proteins: Total proteins – Lowry et al method c) Lipids: Phospholipids and cholesterol. d) Nucleic acid: DNA and RNA. Enzymes: Acid and alkaline phosphatases
ZOOLOGY	VI. Physiology: (i) Study of the following with the help of Computer Assisted Learning (CAL) (please see E-pharm programme). A. The effect of K, Ca acetylcholine and epinephrine on the isolated heart of frog and conclude your data with the graphic representation Computer Assisted Learning (CAL) be included. B. The effect of various doses of acetylcholine arid Nor-epinephrine on blood pressure, heart rate and respiratory rate of the rabbit. C. The effects of Atropine, Epinephrine, Ephedrine and Escrine on Rabbit's Eyes. Other such exercises can be framed from the E-Phram software. (ii) Determination of blood pressure, pulse rate, heart beat and respiration rate. (iii) Photometric determination of hemoglobin in blood sample. (iv) Determine of MCV, MCH, MCHC and colour index of the given sample of blood. (v) Demonstration of the following in blood: Clotting time, erythrocyte Sedimentation rate, haemolysis and crenation. (vi) Determination of the urea in urine/blood. (vii) Determination of the glucose in urine. (viii) Tests of digestive enzymes in different parts of the alimentary canal.

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ZOOLOGY	Cell & Molecular Biology & Biotechnology:
	  Squash and smear preparations of testis of cockroach and grasshopper using aceto-orecin, Fuelgen and Giemsa stains.
	  Study of mitosis in onion root tip.
	   Study of giant chromosomes in the salivary gland of Chironomus or Drosophila Larva.
	  Vital and supravital staining (with Neutral Red and Janus Green B) of cells of the Testis of any insect or mammal to study the mitochondria.
	  Chromosome study in cells of the testis of an insect / mammal / cells of the bone marrow of a mammal.
	  Paper chromatography: Unidimensional chromatography, using amino acids from purified samples and biological materials (Ascending and Descending).
	  Electrophoresis: Paper/Horizontal/Vertical-Proteins/DNA/RNA.
	   Study of prepared microscopic slides, including those showing various cell Types, mitosis, meiosis and giant chromosomes.
	Note: It is compulsory to submit prepared slides from each exercise for examination.

ZOOLOGY	Population Genetics: Numerical problem based on Hardy Weimberg's law, calculation of allelic frequencies, inbreeding genotypic frequencies and estimation of beritability, Problems based on syllabus

ZOOLOGY	Biostatistics:
	  Preparation of frequency diagrams/bardiagrams/histogram/Pie charts. Tables And Graphs/line
	  Exercises on Arithmetic mean, Harmonic mean Geometric mean, Median, Mode (Direct, short-cut and step-deviation).
	  Calculation of standard deviation, variance and standard error of mean.
	  Calculation of probability and significance between means using Students t-test And Chi-square test.
	   Plotting the slope of a lineon a graph; calculations of the slope of a line, coefficient correlation and regression.

ZOOLOGY	Anatomy (a) Major Cranial nerves of Wallago attu. (ii) Cervical nerves of Rat. (iii) Reproductive organs of Rat. (b) Minor (i) Accessory respiratory organs of Heteropneustes fossilis. (ii) Labrinth organs of Anabas testudens.

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Sector-10, Meera Marg, Madhyam Marg, Mansarovar, Jaipur-302020
Ph. 0141-2780436, 2780904 E-mail: stwilfredscollege@gmail.com Website: www.stwilfredscollege.com
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ZOOLOGY	Lower Chordates
	Salpa: asexual and sexual stages, Doliolum-oozoid, Botrylus, Herdmania, Amphioxus.
	Pisces
	Petromyzon, Myxine, Rhinobatus, Pristis, Trygon, Chimaera, Polydon,
	Acipenser, Amia, Lepidosteus, Protopterus, Lepidosiren, Neoceratodus, Notopterus, Exocoetus, Echeneis, Pleuronectes, Mestacembelus, Diodon, Tetradon, Ostracion, Lophis, Syngnathus, Hippocampus, Anguilla, Labeo, Ophiocephalus.
	Amphibian
	Ichthyophis, Necturus, Proteus, Ambystoma, Axolotal, Salamander, Siren, Alytes, Pipa, Bufo, Hyla, Rhacophorus, Rana.
	Reptilian
	Testudo, Chelone, Sphenodon, Calotes, Hemidactylus, Phrynosoma, Draco, Varanus, Chameleon, Cobra, Hydrophis, Rattle snake, Viper, Pit, Viper, Krait, Eryx, Gavialis.
	Aves
	Archaeopteryx Tailor Bird, Indian Koel, Jungle fowl, Peacock, Columba, Parrot, Wood Pecker, Owl, Flamingo, Great Indian Bustard.
	Mammals
	Ornithorhynchus, Echidna, Marcropus, Hedgehog, Manis, Loris, But, Mongoose, Hystrix, Otter.
ZOOLOGY	Lower Chordates
	Herdmania spicules, Herdmania tadpole larva, Amphioxus- T.S. passing through oral hood, pharynx, Testes and ovary, intestine and caudal regions. Ammocoeie larva (whole mount).
	Pisces
	Placoid scale, cycloid scale, ctenoid scale.
	Amphibia
	V.S. skin of frog. T.S. passing through stomach, Duodenum, intestine, liver, pancreas, lung, kidney, testis, Ovary, spinal cord, bone.
	Reptilia
	V.S. skin of lizard.
	Aves
	V.S. skin of bird, contour feather, down feather.
	Mammals
	V.S. skin of mammal. T. S. passing through stomach, intestine, liver, pancreas, kidney, testes, ovary, thyroid gland, adrenal gland, lung, bone and spinal cords L.S./T.S. of pituitary gland, T. S. of simple cuboidal epithelium, simple columnar epithelium, simple squamous epithelium, adipose tissue and reticular tissues, Blood smear-identification of various cell types

Principal
(Dr. FARFEDA HASANI)
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ZOOLOGY	Comparative Osteology (Models/Charts/Diagrams): Comparative account of axial and appendicular skeletons of Frog, Varanus, Fowl and Rabbit (both articulated and disarticulated with the help of models, artificial skeleton and bones).
ZOOLOGY	Tools and Techniques (i) Operations of various types of microscopes. (ii) Use of Phase-contrast microscope. (iii) Use of Flourescence microscope and demonstration of nucleic acid by acridine Orange or ethidium bromide. (iv) Preparation of tissue for TEM. (v) Tissue homogenization and fractionation by differential centrifugation for isolation of mitochondria, nucleic acids and cytosol and use of marker enzymes For assessment of the purity of the components. (vi) Demonstration of GLC, atomic absorption spectrophotometer, CASA etc. (vii) Standardization of oculometer and measurements of tubular diameter cell heights. Nuclear diameters, etc.
ZOOLOGY	Environment Biology (i) Analysis of pond stagnant water for: pH, Acidity, Alkalinity, Dissolved oxygen, CO, Salinity, Phosphates, COD and BOD. (ii) Map (World/India/Rajasthan) Estuaries, oceans. To localize biodiversity, Major rivers, (iii) Collection, isolation and identification of Planktons. (Phyto- and Zoo-planktons).
ZOOLOGY	Ethology (i) Study of the food preference in Tribolium or any other grain/ pulse pest). (ii) Study of communication in Earthworm by Pheromones. (iii) Effect of toxicants on movement of Fish. (iv) Study Learning by Trial and Error in Rat using Hebb- William Maze. (v) Imprinting study using Chick. (vi) Listing of all the animals and recording of behaviour in Zoo Sanctuary/National Park.
ZOOLOGY	Development Biology (i) Frog: Egg, Cleavage (2-, 4-, & 8-celled), Morula, Blastula(including Yolk Plug stage) and neurala stages (Slides as well as preserved materials) (ii) Chick: 16 hrs, 21hrs, 24 hrs, 28hrs, 33hrs, 38 hrs, 48hrs, 70hrs and 96 hrs. (iii) Chick development: Appearance of eyes, hair, beak and limbs. (iv) Window making: To study development of chick and blastoderm mounting.

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ZOOLOGY	Visit to at least 3 biomes of India for the detail study: Student should submit the report on the study covering major fauna, flora and geography.
ZOOLOGY	Determination of population density
ZOOLOGY	Collection of flora (herbarium) & fauna (insect)
ZOOLOGY	Visit to some of the few following natural habitats and wildlife sanctuaries desert, mountain range, wetland, coastal habitat, forest wildlife sanctuaries of India and especially Rajasthan. (students are required to submit the joint report on the field visits Undertaken by them)
ZOOLOGY	Identification of mammalian species using hair imprinting, electrophoresis to identify the species of wildlife, collection of molts of birds
ZOOLOGY	Determination of population density of small mammals using transect method
ZOOLOGY	Collection and identification of insect fauna of wildlife habitats
ZOOLOGY	Collection of fecal matter samples of herbivore from wildlife habitat to study the Parasitic load
ZOOLOGY	Determination of home range of birds/mammals
ZOOLOGY	Study of herd structure of herbivore population
ZOOLOGY	Study of hierarchy in monkey population
ZOOLOGY	Water analysis for fresh and waste water for physicochemical properties and planktons
ZOOLOGY	Air quality monitoring
ZOOLOGY	Bioassay of polluted water using microbes or any other higher animal (fish)
ZOOLOGY	Pesticide residue analysis using GC and TLC techniques
ZOOLOGY	Water pollution detection (microbial)
ZOOLOGY	Trips to natural habitat and manmade habitats to study the human impact on Environment. Project work
ZOOLOGY	Electrophoretic analysis of proteins.
ZOOLOGY	Enumeration and isolation of soil microorganisms agar plate technique, bacteria, fungi And protozoa
ZOOLOGY	Bacterial examination of water for portability, microorganism, E-coli, staphylococci Faccalis as indicators of pollution. MPN index- IMVIC test- Endo agar
ZOOLOGY	Testing of water/soil/sweage for physicochemical parameters including COD and BOD
ZOOLOGY	Field trip to ponds/coastal/other treatment (water or industrial water) plants. Report to be submitted.
MATHS	Ploting the graphs of the following functions- ax , √ax+b, (ax+b), x 1/n, e ax+b, log(ax+b), Sin(ax+b), Cos(ax+b), |Sin(ax+b)|, |Cos(ax+b)| observe and discuss the effects of change in the real constant a, b and c on the graphs
MATHS	Graphs of hyperbolic functions and inverse trigonometric functions.

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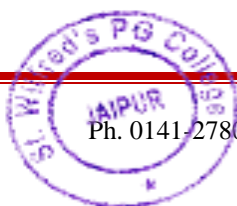Where the mind is without fear! Where the head is held high!!

MATHS	Plotting and analyzing the graphs of polynomials and their derivaties
MATHS	Complex numbers, operations like addition, subtraction, multiplication, division, modules and inbuilt functions conj, imag, imult, isreal, real
MATHS	Matrix Operations: Addition, Multiplication, Inverse, Transpose, Determinant, Rank and inbuilt functions eye, ones, zeros, solving the system of linear equations
MATHS	Solution of linear programming problems by using inbuilt functions of scilab
MATHS	Printing n terms of Fibonacci sequence
MATHS	Finding n! $\sum n$, $\sum n2$ etc
MATHS	Defining a function and finding sym of n terms of a series\ Sequence whose general term is given
MATHS	Printing pascal's triangle
MATHS	Finding gcd and |cm of two numbers by Euclid's algorithm
MATHS	Checking prime \composite number
MATHS	Finding number of primes less than n,n.∈z
MATHS	Finding mean , standard deviation and npr,ncr for different n and r
MATHS	Numerical integration using trapezoidal
MATHS	Numerical integration using simpson's 1/3 Rule
MATHS	Numerical integration using simpson's 3/8 Rule
MATHS	Numerical integration using waddle Rule
MATHS	Solution of algebric and transcendental equation by Bisection method
MATHS	Solution of algebraic and trascendetal equation By Regula – falsi methods
MATHS	Solution of algebraic and transcendental equation By Newton- Raphson method.
MATHS	Solutions of Initial value problem by Euler's method
MATHS	Solutions of Initial value problem by Runga method (third and fourth order method)
MATHS	Matrix operations: Addition
MATHS	Matrix operations: Subtraction
MATHS	Matrix operations: MultiplicationMatrix operations: Rank of a matrix
MATHS	Matrix operations: Inverse of a matrix
MATHS	Solution of linear algebric equation by Gauss eliminational method.
MATHS	Solution of linear algebric equation by matrix method.
MATHS	Solution of linear algebraic equation by Gauss Jordan method.
PSYCHOLOGY	Measurement of Attitude
PSYCHOLOGY	Measurement of Emotions by Facial Expression (Experiment)
PSYCHOLOGY	Measurement of Leadership
PSYCHOLOGY	Measurement of Aggression
PSYCHOLOGY	Measurement of Social Support
PSYCHOLOGY	Measurement of Altruism
PSYCHOLOGY	Measurement of Intelligence (Performance test)
PSYCHOLOGY	Experiment on Human Maze Learning

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PSYCHOLOGY	Experiment on Memory (Meaningful & Non-sense syllables through memory drum)
PSYCHOLOGY	Assessment of State & Trait Anxiety
PSYCHOLOGY	Measurement of Coping Styles
PSYCHOLOGY	Measurement of Depression
PSYCHOLOGY	Measurement of Family Pathology
PSYCHOLOGY	Eight State questionnaire
PSYCHOLOGY	Assessment of Mental Health
PSYCHOLOGY	Word Association Test
PSYCHOLOGY	Neuropsychological Assessment
PSYCHOLOGY	Stress: Measurement and analysis of Group Data (Mean and Median)
PSYCHOLOGY	Stress: Measurement and analysis of Group Data (t-test)
PSYCHOLOGY	Measurement of Intelligence (SPM)
PSYCHOLOGY	Personality Assessment through HSPQ
PSYCHOLOGY	Measurement of Subjective Well-being
PSYCHOLOGY	Measurement of Forgiveness
PSYCHOLOGY	Measurement of Emotional Intelligence
PSYCHOLOGY	Measurement of Resilience
PSYCHOLOGY	Measurement of Level of Aspiration
PSYCHOLOGY	Incidental vs Intentional learning
PSYCHOLOGY	Problem Solving
PSYCHOLOGY	Experiment on Short Term Memory
PSYCHOLOGY	Zeigarnik Effect
PSYCHOLOGY	Semantic Differential Scale
PSYCHOLOGY	Need Hierarchy by Ranking method
PSYCHOLOGY	Set in Thinking
PSYCHOLOGY	Effect of knowledge of result on performance
PSYCHOLOGY	Verbal learning – Intraserial
PSYCHOLOGY	Psychophysical experiments on RL and DL
PSYCHOLOGY	Study of Home Environment
PSYCHOLOGY	Social Perception
PSYCHOLOGY	Leadership
PSYCHOLOGY	Attribution Style
PSYCHOLOGY	Educational Aspiration
PSYCHOLOGY	Assessment of Mental Health
PSYCHOLOGY	16 PF
PSYCHOLOGY	Eyeseneck Personality Questionnaire
PSYCHOLOGY	Crisis Intervention
PSYCHOLOGY	Rorschach Test
GEOGRAPHY	Definition of Scales and Types:- a. Plain Scale b. Comparative Scale c. Diagonal Scale

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GEOGRAPHY	Graphs:- a. Climatograph b. Hythergraph c.Wind Diagram
GEOGRAPHY	Weather Maps a. Wind Symbols b. Cloud Symbols c. Forms of Metrological Aprossed by International d. Metrological organization e. Symbols of cloud types f. Wheather Instruments
GEOGRAPHY	Methods of Representation of Relief Hachore, Hill shading (vertical illumination, Oblique illumination) Benchmark, Spot height,Contours, farm lines, drawing of cross section (i) Conical hills (ii) Plataue (iii) Types of Slopes- Valleys, cliff, concave slope, convex slope, uniform slope, non uniform slope, terraced slop, undulating slope.
GEOGRAPHY	Profiles- Serial profile, Superimposed profile, Projected profile, Composite profile
GEOGRAPHY	Surveying- Meaning, Classification, Chain and type surveying
GEOGRAPHY	Sample bar diagram
GEOGRAPHY	Multiple bar digram
GEOGRAPHY	Compound bar diagram
GEOGRAPHY	Duo Dixctonal bar diagram
GEOGRAPHY	Age & Sex wise population of Rajasthan
GEOGRAPHY	Divided rectangle diagram
GEOGRAPHY	Square block diagram
GEOGRAPHY	Unit square block diagram
GEOGRAPHY	Unit square diagram
GEOGRAPHY	Wheel diagram
GEOGRAPHY	Ring diagram
GEOGRAPHY	Spherical diagram
GEOGRAPHY	DOT map
GEOGRAPHY	Choropleth
GEOGRAPHY	Traffic Flow
GEOGRAPHY	Pictorial methods
GEOGRAPHY	Isotherm
GEOGRAPHY	Isohyte
GEOGRAPHY	Isobar
GEOGRAPHY	Chromatic map
GEOGRAPHY	Bar diagram
GEOGRAPHY	Prismatic compass
GEOGRAPHY	Conventional signs
GEOGRAPHY	Topographical sheets

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GEOGRAPHY	Mean, mode, median
GEOGRAPHY	Standard deviation
GEOGRAPHY	Quartile deviation
GEOGRAPHY	Classification of projections according to the method of construction.
GEOGRAPHY	Type of zenithal projection.
GEOGRAPHY	One strandard parallel conical projection.
GEOGRAPHY	Bonnie's Projection.
GEOGRAPHY	Polyconic projection.
GEOGRAPHY	Cylindrical equidistant projection.
GEOGRAPHY	Cylindrical equal area projection.
GEOGRAPHY	Mercator's or cylindrical orthomorphic projection.
GEOGRAPHY	Gall's stereographic projection.
GEOGRAPHY	Polar zenithal equidistant projection.
GEOGRAPHY	Gnomonic polar zenithal projection.
GEOGRAPHY	Stereographic polar zenithal projection.
GEOGRAPHY	Orthographic polar zenithal projection.
GEOGRAPHY	Spherical diagram.
GEOGRAPHY	Cube diagram.
GEOGRAPHY	Block pile diagram
GEOGRAPHY	Plane table survey
GEOGRAPHY	Indian clinometer
GEOGRAPHY	Types of Projections
GEOGRAPHY	Sample conical projection with one standard parallel
GEOGRAPHY	Conical projection with two standard parallel
GEOGRAPHY	Mercator's projection
GEOGRAPHY	Polar zenithal equidistant projection
GEOGRAPHY	Gall's projection
GEOGRAPHY	Cylindrical equal area projection
GEOGRAPHY	Polar zenithal equal area projection
GEOGRAPHY	Type of Zenithal projection
GEOGRAPHY	Enlargement and reduction of map
GEOGRAPHY	Tenary Diagram
GEOGRAPHY	Climograph of Kolkata
GEOGRAPHY	Climograph of jodhpur
GEOGRAPHY	Hythergraph of meerut
GEOGRAPHY	Poly linear graph
GEOGRAPHY	Histogram
GEOGRAPHY	Isopleth map
GEOGRAPHY	Cloropleth map
GEOGRAPHY	Chromatic map
GEOGRAPHY	Choroschematic map
GEOGRAPHY	Isobar
GEOGRAPHY	Isohytes
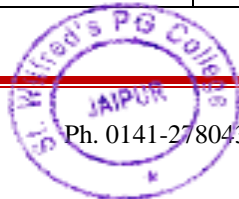
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GEOGRAPHY	Isotherm
GEOGRAPHY	Mean, mode, median
GEOGRAPHY	Simple pyramid diagram
GEOGRAPHY	Compound pyramid diagram
GEOGRAPHY	Superimposed pyramid diagram
GEOGRAPHY	Scope of cartography
GEOGRAPHY	Water budget of district Ghaziabad
GEOGRAPHY	Folded rock beds
GEOGRAPHY	Faulted rock beds
GEOGRAPHY	Ring diagram
GEOGRAPHY	Mechanical method of lettering
GEOGRAPHY	History of cartography
GEOGRAPHY	Village survey report
GEOGRAPHY	Method of representation of relief
GEOGRAPHY	Hachure method and morphological method
GEOGRAPHY	Contours
GEOGRAPHY	Contour inspection method
GEOGRAPHY	Cross section method and similar triangle
GEOGRAPHY	Gradient method
GEOGRAPHY	Profiles
GEOGRAPHY	Serial profile
GEOGRAPHY	Superimposed, projected & Composite profile
GEOGRAPHY	Method of drawing profile
GEOGRAPHY	Conventional method.
GEOGRAPHY	Square block diagram
GEOGRAPHY	One point perspective Block diagram
GEOGRAPHY	Two point perspective Block diagram
GEOGRAPHY	One & Two point perspective Block diagram
GEOGRAPHY	Multiple section method of Block Diagram
GEOGRAPHY	Sketch Block diagrams
GEOGRAPHY	Aerial photography
GEOGRAPHY	Classification aerial photography
GEOGRAPHY	Principal point fiducial marks & Overlap
GEOGRAPHY	Lens stereoscope & mirror stereoscope
GEOGRAPHY	Ergograph
GEOGRAPHY	Hypsometric Curves
GEOGRAPHY	Altimetric frequency graph
GEOGRAPHY	Dumpy level
GEOGRAPHY	Theodolite
GEOGRAPHY	Plane table, tripod stand, Alidade
GEOGRAPHY	Plumbing fork, plumb-bob, spirit level, ranging rod
GEOGRAPHY	Indian Clinometer
GEOGRAPHY	Method of using Indian Clinometer

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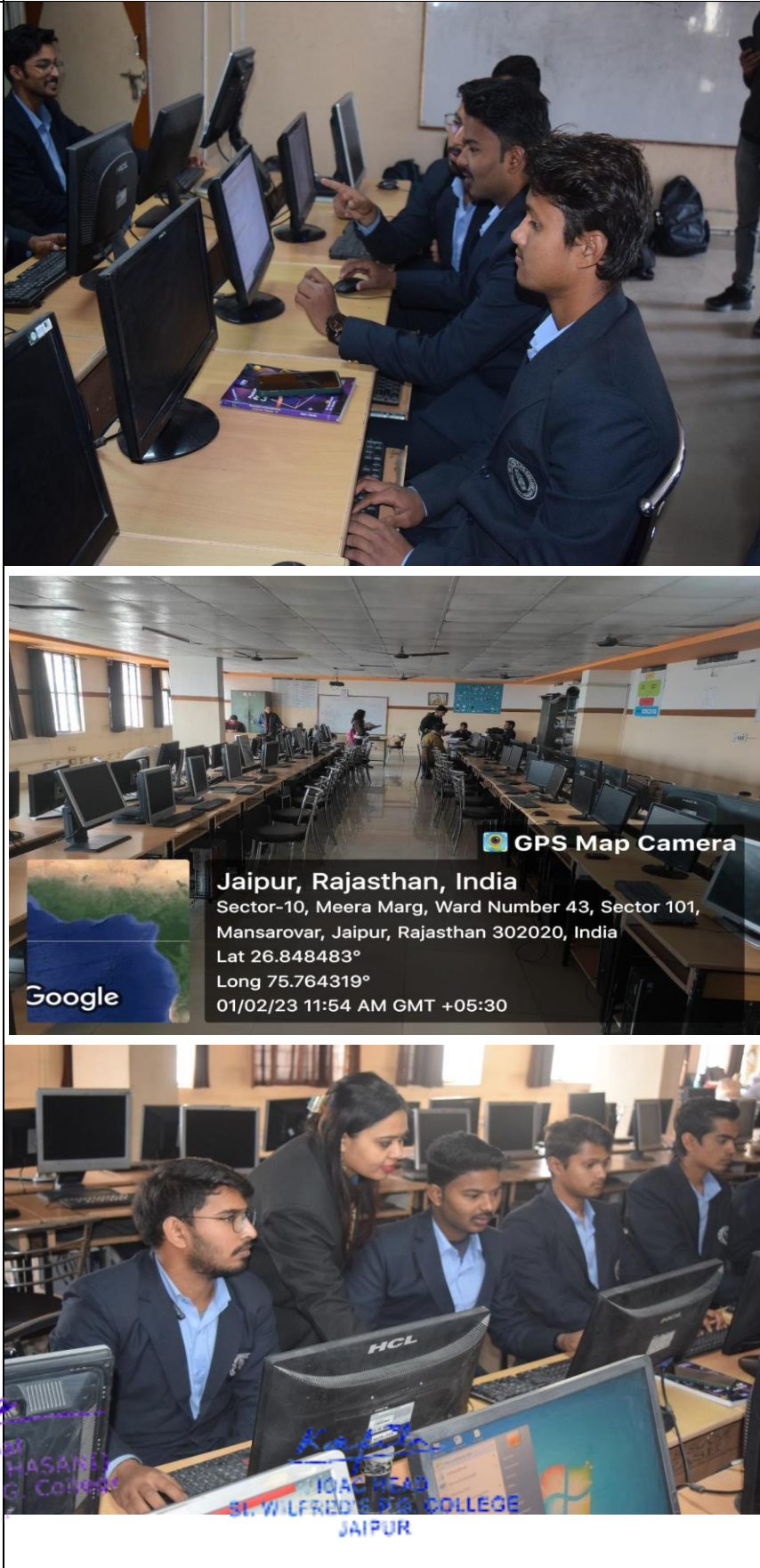Jaipur

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GEOGRAPHY	Topographical maps series of India & adjacent countries
GEOGRAPHY	Topographical sheets
GEOGRAPHY	Method of average slope determination
GEOGRAPHY	Grid
GEOGRAPHY	No. of Contour of crossing per capita
GEOGRAPHY	Average number of counter crossing per kilometer
GEOGRAPHY	Degree
GEOGRAPHY	Average Slope
GEOGRAPHY	Toposheet
MUSIC	To sing a given musical piece
MUSIC	To recognize the raga
MUSIC	To show the difference of ragas by means of characteristics Swarvistaras and to play Swar-Vistar in all the ragas.
MUSIC	Knowledge of Bolas and Thekas on Hand Palm and Tabla to recognize prescribe Talas in syllabus as – Dhamar, Tilwara, Trial, Ektal, Chautal, Kaharva and Dadra.
MUSIC	To sing Aroh, Avroh, Pakad and Swar Vistar of the following ragas – Yaman, Bageshree, Bhoopali, Bheempalasi, Alhaiyabilawal, Hindol and Desh
MUSIC	To sing and play aBadakhyal and Chhotakkhyal with sufficient varieties of Aalap – Tanas in the following three ragas 1. Yaman 2. Bageshree 3. Bheempalasi
MUSIC	With the accompaniment of table to sing Chhotakhyal with Aalap-Tanas in any three ragas of the following 1. Alhaiya-bilawal 2. Hindol 3. Bhoopali 4. Des
MUSIC	With to play a composition composed in other than Trital in any of the ragas/ One Dhruvpad and Dhamaar with Dugun in any ragas
GEOLOGY	Study different Physical Properties of Minerals
GEOLOGY	Identification of minerals on the basis of their physical properties
GEOLOGY	Determination of Specific Gravity by: a) Jolly's Spring Balance b) Walkers Steel Yard Balance
GEOLOGY	Study and identification of different types of Rocks. (Igneous, sedimentary & metamorphic rocks)
GEOLOGY	Study and sketching of various types of faults (normal, reverse, dip, shake, non - plunging and plunging faults
GEOLOGY	Study and sketching of various types of structure folds (anticline, syncline, symmetrical & asymmetrical
GEOLOGY	Determination of Dip and Strike of geological structures with a Clinometer Compass
GEOLOGY	Geological cross sections and study of geological maps

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1.	Computer Science	

2.	Botany	

| 3. | Chemistry | |

4.	Geography	

5.	Physics	

6.	Psychology	 GPS Map Camera Jaipur, Rajasthan, India Sector-10, Meera Marg, Ward Number 43, Sector 101, Mansarovar, Jaipur, Rajasthan 302020, India Lat 26.848483° Long 75.764319° 01/02/23 11:22 AM GMT +05:30

7.	Zoology	