MUGBERIA GANGADHAR MAHAVIDYALAYA
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NAAC Re-Accredited B+Level Govt. aided College
CPE (Under UGC XII Plan) & NCTE Approved Institutions
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Syllabus distribution of 2018-2019

Mughberia Gangadhar Mahavidyalaya

Dept. of Nutrition

Programme: B.Voc (Food Processing)

SEM	COURSE	COURSE CONTENT & SYLLABUS	DETAILS SYLLABUS	ALLOTTED TEACHER	CREDIT MARKS	CLASS ALLOTTED PER WEEK	TOTAL CLASS
Sem 1	BVFPS101T&P	**BASIC PRINCIPLE OF FOOD PROCESSING AND PRESERVATION**	**THEORY** **Unit I** **Food Processing**: Scope and importance of food processing; historical developments in food processing, classification of food on basis of shelf life, pH and origin **Unit II** **Food spoilage**: microbial, physical, chemical & miscellaneous. **Unit III** **Thermal processing methods and preservation**: heat resistance of microorganisms, thermal death curve. Blanching, pasteurization, sterilization, Canning of foods, heat penetration **Unit IV** **Preservation by low temperature** Refrigeration, refrigeration load, refrigeration systems, Freezing and frozen storage: freezing curves, slow and quick freezing, factors determining freezing rate, freezing methods, advantages and disadvantages, changes in food during freezing, freeze drying in food processing **Unit V** **Moisture removal**: Evaporation, drying, dehydration and concentration, Principle, Methods, equipment and effect on quality: Drying curve, drying methods and type of dryers; physical and chemical changes in food during drying. Need and principle of concentration, methods of concentration (thermal concentration, freeze concentration, memberane concentration) changes in food quality by concentration **Unit VI** **Preservation by salt and sugar**: Pickling, fermentation, intermediate moisture foods **Unit VII** **Food Additives**: Different types of food additives (preservatives, acidulants, emulsifiers, antioxidant, leavening agents etc.) and its application in food industry **Unit VIII** **New and unconventional methods of preservation:** pulse electric field processing, high pressure processing, ohmic and infrared, microwave heating. **PRACTICALS** 1. Demonstration of various machineries used in food processing. 2. To study the effect of enzymatic browning in fruits and vegetables and its prevention. 3. To study different types of blanching of fruits and vegetables. 4. Preservation of food by canning. 5. To perform cut out analysis of caned product.	Sucheta Sahoo	3(Class test-30+attendence +assignment-10+theory-30practical-30)	5	15x5=75

			6. Preservation of food by high concentration of sugar i.e. jam. 7. Preservation of food by high concentration of salt/acid i.e. pickle. 8. Preservation of food by addition of chemicals i.e. tomato ketchup. 9. Preservation of food by drying in a cabinet drier. 10. Preservation of fruits & vegetables by freezing. 11. Preservation of milk by pasteurization and sterilization. 12. Preservation of food by using acidulants i.e. pickling by acid, vinegar or acetic acid 13. Demonstration on drying of green leafy vegetables				
	BVFPS102T&P	CEREAL AND PULSE PROCESSING TECHNOLOGY	**UNIT I** Present status and future prospects of cereals and millets; Morphology: physico-chemical properties; Chemical composition and nutritive value Rice: Paddy processing and rice milling: conventional milling, modern milling, milling operations, millingmachines, milling efficiency, byproducts of rice milling. Quality characteristics influencing final milled products. Parboiling: rice bran stabilization and its methods; Aging of rice; Enrichment – need, methods; processed foods from rice – breakfast cereals, flakes, puffing, canning and instant rice. Wheat: break system, purification system and reduction system; extraction rate and its effect on flour composition; Quality characteristics of flour and their suitability forbaking. Corn: Corn milling – dry and wet milling, starch and gluten separation, milling fractions and modified starches.Barley: Malting and milling Sorghum: milling, Malting, Pearling and industrial utilization Millets: Importance of Millet, composition, processing of millets for food uses, major and minor millets Products and Byproduct of cereal and millets: infant foods from cereals and millets, breakfast cereal foods –flaked, puffed, expanded, extruded and shredded products, etc. **UNIT II** Present status and future prospects of legumes; Morphology of legumes; Classification and types of legumes, Anti-nutritional compounds in legumes; Methods of removal of anti-nutritional compounds, Milling of legumes: home scale, cottage scale and modern milling methods, milling quality, efficiency and factors affecting milling; problems in dhal milling industry, Soaking and germination of pulses, Cooking quality of legumes – factors affecting cooking quality, Byproduct of pulses and their value addition. **PRACTICALS** 1. Determination of physical properties of cereal grains 2. Determination of chemical properties of cereal grains 3. Germination of grains 4. Studies on cooking quality of cereals (cooking time, grain elongation, etc) 5. Functional properties of different cereal flour 6. Determination of starch content of cereal 7. Study on gelatinization of starch 8. Determination of amylase content of rice 9. Determination of fat acidity of cereals 10. Phenol test for cereals Determination of sedimentation value 11. Milling of cereal grains 12. Visit to milling industry 13. Determination of physical properties of legumes 14. Determination of anti nutritional factors in legumes 15. Cooking quality of dhal 16. Puffing of legumes 17. Milling of legumes 18. Preparation of composite legume flour 19. Preparation of soy milk and soy paneer	Sucheta Sahoo	3(Class test-30+attendence +assignment-10+theory-30practical-30	6	6x15=90

			20. Preparation of protein isolate 21. Preparation of quick cooking dhal 22. Visit to dhal mill				
	BVFPS103T&P	LIQUID MILK PROCESSING TECHNOLOGY	**UNIT I** Milk Production Management - Distinguishing characteristics of Indian and exotic breeds of dairy animals and their performance; feed resources for milk production and their nutritive values; structure and function of mammary system; milk secretion and milk let-down; milking procedure and practices for quality milk production (clean milk production) **UNIT II** History and status of dairy in India, Annual milk production and per capita availability, Five year plans and dairy development, public sector milk supply schemes, co-operative dairy organizations, Anand pattern and perspectives, milk products manufacture in private sector, National Dairy Development Board - aim and objectives, Operation Flood, Dairy problems and policies. Contribution of Verghese Kurien in Indian dairy. **UNIT III** Milk - Definition, Composition, factors affecting composition of milk, nutritive value, Physico-chemical properties of milk constituents, Physico-chemical properties of milk, microbiology of milk. **UNIT IV** Importance of market milk, Collection and transportation of milk-Organization of milk collection routes, Practices for collection of milk, preservation at farm, refrigeration, natural microbial inhibitors, lactoperoxidase system., Adulterations in milk and its detection, processing, packaging and storage. UHT sterilization, Aseptic packaging, Judging and grading of milk, Flavour defects in milk, their causes and prevention, Effect of thermal treatment on milk constituents. **Unit V** Special milk: manufacture, packaging, storage of sterilized milk, homogenized milk, soft-curd milk, flavoured milk, vitaminized milk, frozen concentrated milk, fermented milk (natural butter milk, cultured butter milk, acidophilus milk, bulgarian butter milk, Kumiss, Kefir, yoghurt), standardized milk, reconstituted milk, recombined milk, toned milk, double tonned milk, humanized milk, filled milk, imitation milk, vegetable tonned milk, soya milk **Unit VI** Liquid milk collection, processing, packaging and storage systems and equipment - bulk milk coolers, milk chilling units, milk reception equipment, milk tanks/silos, centrifuges, clarifiers, filtration units, cream separator, homogenizers, pasteurizers, sterilizers, packaging and filling machines **Unit VII** Cleaning and sanitization of dairy equipments, CIP units, etc.; Hygienic design concepts, sanitary pipes and fittings, corrosion process and their control. **PRACTICALS** 1. Method for milking of dairy animals 2. Cleaning and sanitation of milking equipments 3. Method for sampling of milk 4. Microbiological tests for grading raw milk - MBRT 5. Chemical tests for grading raw milk- Platform tests of raw milk. 6. Detection of adulterants in milk 7. Determination of physical properties of milk - pH, titratable acidity of milk. 8. Determination of Moisture, fat, SNF, casein, whey proteins, total milk proteins, lactose, ash 9. Determination of phosphorus and calcium, chloride in milk.	Apurba Giri	5(Class test-30+attendence +assignment-10+theory-30practical-30	6	6x15=90

			10. Estimation of alkaline phosphatase and lipase in milk. 11. Identification and demonstration of liquid milk processing equipment, pipes and fittings 12. Preparing standardized milk as per requirement 13. Separation of fat from milk 14. Pasteurization and homogenization of milk 15. Packaging of liquid milk 16. Preparation of sterilized flavored milk, reconstituted milk/rehydrated milk, buttermilk, yogurt, Lassi 17. Campaign on clean milk production in rural area 18. Visit to chilling center and dairy plant				
	BVFPS104T&P	FOOD ADDITIVES AND INGREDIENT	**UNIT I** Food additives- definitions, classification and functions, Preservatives, antioxidants, colours and flavours (synthetic and natural), emulsifiers, sequesterants, humectants, hydrocolloids, sweeteners, acidulants, buffering salts, anticaking agents, etc. - chemistry, food uses and functions in formulations; indirect food additives; toxicological evaluation of food additives. Food additives as toxicants - Artificial colours, preservatives, sweeteners; toxicants formed during food processing such as nitrosamines, maillard reaction products acrylamide, benzene, heterocyclic amines and aromatic hydrocarbons; risk of genetically modified food, food supplements, persistent organic pollutants, toxicity implications of nanotechnology in food. **UNIT II** Scope of spice processing industry in India. Spices -definition. Chemical composition, uses and processing of different spices-pepper, cinnamon, turmeric, fennel, chilli, cardmom (small and big), cumin, mint, ginger cloves and fenugreek. Condiments- definition. Spice oleoresins, spice essential oils, encapsulated spices (Brief). Packaging of spices and spice products. Microbial contamination and insect infestation in spices and its control. **UNIT III** Food flavours- natural and synthetic flavourings. Flavour enhancers their properties and toxicity. Flavours from vegetables, cocoa, chocolate, coffee, vanilla beans. Evaluation tests for flavours. stability of flavours during food processing, analysis of flavours, extraction techniques of flavours, flavour emulsions; essential oils and oleoresins; authentication of flavours etc. **UNIT IV** Proteins, starches and lipids as functional ingredient; isolation, modification, specifications, functional properties and applications in foods and as nutraceuticals **PRACTICAL** 1. Determination of moisture in whole and ground spices. 2. Determination of total ash in spices. 3. Sampling and determination of extraneous matter in spices. 4. Determination of pungency rating (Scoville method) in red pepper. 5. Adulteration tests for different spices. 6. Organoleptic evaluation of flavours. 7. Identification of saffron by sulphuric – diphenylamine test. 8. Determination of cold water extract. 9. Determination of alcohol soluble extract. 10. Determination of calcium oxide. 11. Determination of volatile oil. 12. Microscopic examination of spices. 13. Detection of Argemone seeds in mustard. 14. Detection of oil soluble color. 15. Extraction of oleoresins from spices. 16. Analysis of different types of flavours such as essential oils,	Sucheta Sahoo	3(Class test-30+attendence +assignment-10+theory-30practical-30	5	5x15=75

			oleoresins, synthetic flavours, plated anddispersed spices-general tests. 17. Sensory analysis of flavours; monitoring flavours during food processing 18. Preparation of flavour emulsions and their stability 19. Study of off-flavours in different foods. 20. Extraction of flavors from various fruits and vegetables				
	BVFPS105T&P	FOOD CHEMISTRY	**UNIT I:** **Water-** Introduction to food chemistry- Definition, scope and importance, structure of water molecule, hydrogen bonding, effect of hydrogen bonding on the properties of water, moisture in foods, free water, bound water, water activity, estimation of moisture in foods, determination of moisture and water activity. **UNIT II** **Carbohydrates** Nomenclature, composition, sources, structure, reactions, functions, classification - monosaccharide, disaccharides, oligosaccharides and polysaccharides. Properties of Starch – gelatinisation, gel formation, syneresis**,** starch degradation, dextrinisation, retrogradation, Qualitative and quantitative tests of carbohydrates. **UNIT III** **Proteins** Nomenclature, sources, structure, functions, classification - essential and non-essential amino acids, Physical and chemical properties of proteins and amino acids, functional properties - denaturation, hydrolysis, changes in proteins during processing. Enzymes - criteria for purity of enzyme, Specificity, mechanism of enzyme action, factors influencing enzymatic activity, controlling enzyme action, enzymes added to food during processing, **Browning reaction**- Enzymatic and non enzymatic browning, advantages and disadvantages, factors affecting their reaction and control. **UNIT IV** **Fats and oils** Nomenclature, composition, sources, structure, functions, classification, essential fatty acids. Physical and chemical properties - hydrolysis, hydrogenation, rancidity and flavour reversion, emulsion and emulsifiers, saponification value, acid value and iodine value, Reichert-Meissl number, Polenske value, smoke point. Lipids of biological importance like cholesterol and phospholipids **UNIT V** **Minerals and Vitamins** Minerals and Vitamins: Sources and structures of minerals & vitamins; Effect of processing and storage of vitamins, Pro vitamins A & D; Vitamins as antioxidants. **PRACTICALS** 1. Determination of water activity of different food materials 2. Determination of moisture in food sample 3. Determination of Protein in food sample 4. Determination of Fat in food sample 5. Determination of Carbohydrate in food sample 6. Determination of Acidity and pH in food sample/beverages 7. Determination of total, non-reducing and reducing sugars 8. Determination of Vitamin C in food sample 9. Estimation of crude fibre in food sample 10. Analysis of lysine content in animal /vegetable sources 11. Estimation of mineral in food products 12. Estimation of Carotenoids 13. Precipitation of proteins by acid, alkali and metals. 14. Estimation of rancidity of fats. 15. Estimation of crude fibre in food sample 16. Determination of total, non-reducing and reducing sugars Calculate activity of enzymes from various fo	Sucheta Sahoo	4(Class test-30+attendence +assignment-10+theory-30practical-30	5	5x15=75
Sem	BVFPS20	DAIRY	**UNIT I**	Apurba Giri	5(Class	6	6x1

2	1T&P	PRODUCTS PROCESSING TECHNOLOGY	Cream: Definition, classification, composition, nutritive value, Physico-chemical properties, manufacture ofdifferent types of cream, processing of cream; defects in cream and their prevention Butter: Definition, composition; nutritive value, processing and production steps, overrun, butter makingmachines, quality testing of table butter, butter-defects, causes and their prevention, packaging and storage Butter oil and ghee: Definition, composition, nutritive value, processing, equipment, quality tests; **UNIT II** Ice cream and frozen desserts: Definition, composition, nutritive value, role of the constituents in ice cream,types, Processing steps, equipment, quality testing, defects causes and prevention, packaging and storage. **UNIT III** Condensed and Dried milk: Definition, composition, role of milk constituents in condensed milk, manufacture of condensed milk, Heat stability and its control , uses, defects, causes and prevention of condensed milk. Types of standards for dried milk, Role of milk constituents, Manufacture of SMP and WMP using roller and spray drying, cyclone separation, instantization, quality testing, defects, causes and prevention, packaging and storage. malted milk powder, infant milk food **UNIT IV** Cheese: Definition, composition, standards, origin and history of cheese, status and scope in India and abroad, types, manufacture of different varieties of cheese: Cheddar, Swiss, Mozzarella, Cottage, processed cheese, cheese spread and processed cheese foods; equipment, Microbiological changes during preparation ripening in cheese. Role of milk constituents and changes during manufacture and ripening in cheese. Accelerated ripening of cheese. quality defects, causes and prevention, packaging and storage. **UNIT V** Traditional Indian Dairy Products: Definitions, compositions, processing, packaging, storage, equipment and quality testing – Desiccated milk-based products-Khoa and Khoa based sweets, Heat-acid coagulated products-Channa and Channa based sweets, Paneer, Fermented products-Srikhand, dahi, Milk-based puddings/Dessert- Kheer **UNIT-VI** By-products-manufacturing and uses of Casein, sodium and calcium caseinates, casein hydrolysates, Cooprecipitates, Whey, Whey protein concentrates, Lactose, Butter milk, Ghee residue **PRACTICALS** 1. Process of sampling of milk products 2. Cream: Different parts of cream separators, cream separation form milk, standardization, neutralization, pasteurization of cream, chemical and microbiological examination of cream 3. Butter: Study of construction and cooperation of the power operated butter churn and butter packaging machine, manufacture of butter, examination of the quality of sodium chloride for butter making, chemical and microbiological examination of butter 4. Ghee: Study and operation of continuous ghee plant. Preparation of ghee from cream and butter. Determination of melting/slip point, moisture, B.R. Index and Baudouin Test, Acidity, R.M. value and Polenske value, Saponification value, Iodine value, Peroxide value. Detection of animal body fats and vegetable oils, Helphen Test for the presence of cotton-seed oil. 5. Preparation of ice-cream and selected frozen desserts- kulfi, sherbets/ices, Compositional analysis of ice-cream. Microbiological examination of ice-cream and other frozen desserts; SPC, coliform. 6. Preparation of condensed milk, evaporated milk, spray dried milk powder, instant milk powder, tea and coffee whitener, malted milk		test-30+attendence +assignment-10+theory-30practical-30		5=90

			powder, infant milk food, Chemical and microbilogical analysis of condensed and dried milk. Evaluation of bulk density and solubility index of dried milk. 7. Cheese Technology: Familiarization with equipments, accessories and standardization numericals. Study of factors affecting rennet action. Manufacture of Cheddar cheese, Mozzarella cheese, Swiss cheese, Cottage cheese, processed cheese, processed cheese spread, processed cheese food. Analysis of cheese; proximate composition. Determination of ripening index, 8. Preparation of selected Indian dairy products – Chhana, chhana based sweets, .paneer, khoa, khoa based products, misti dahi, Shrikhand, kheer etc, their chemical and microbiological analysis 9. Dairy byproduct;Manufacture casein, sodium caseinate, calcium caseinate. co-preceinate, whey drinks, dried whey, whey protein concentrate, lactose, buttermilk, ghee residue, products of ghee residue,. Whey concentration by ultra filtration process. Chemical and microbiological analysis of casein , whey, dried whey, whey protein concentrates, co-precipitates and lactose, buttermilk. 10. Visit to milk product plant				
	BVFPS202T&P	PRINCIPLES OF FOOD ENGINEERING	UNIT I Process time calculations; Sterilizers and accessories used in canning industries; Engineering aspects ofpasteurizer; homogenizer, evaporators (basic principle and single-effect evaporator) and concentrators usedinfood industries; Seaming machine. UNIT II Construction of cold storage; Different types of freezers including plate contact freezer, air blast freezer,cryogenicfreezing and refrigerated vans. UNIT III Various types of driers (basic principle and drying time) – Tray drier, roller drier, spray drier, fluidized beddrier,freeze drier and solar drier. UNIT IV Heat exchangers (including paraflow HEs); Extruders – Basic principles and types, Difference between single-andtwin-screw extruders; Kneader; Oil expeller UNIT V Liquid transport system- pipelines and pumps for food processing plants- positive displacement pumps, air-liftpumps, propeller pumps, centrifugal pumps and jet pumps. UNIT VI Advanced separation processes: Dialysis, ultrafiltration, reverse osmosis, electro dialysis andmembraneseparation. **PRACTICALS**: 1. Determination of conductivity, calorific value and filtration properties of food& water. 2. Calculation of freezing time for some typical foods 3. Determination of Textural characteristics TPA of food product 4. Study of single effect evaporator and estimation of heat/mass balance during concentration of liquidfoods 5. Study of sterilizer / pasteurizers/ homogenizers 6. Study of dryers, and its efficiency 7. Visit to food processing plants.	Sucheta Sahoo	4(Class test-30+attendence +assignment-10+theory-30practical-30	5	5x15=75
	BVFPS203T&P	FOOD MICROBIOLOGY AND SAFETY	**UNIT -I** Microorganisms important in food industry: Types of microorganisms, their importance in foods, classification offood borne bacteria, their morphology	Sucheta Sahoo	4(Class test-30+attendence +assignment-	6	6x15=90

			and distinguishing features with examples. **UNIT-II** Growth of microorganisms in foods: Intrinsic (pH, moisture content, redox potential, nutrient content, antimicrobial constituents and biological structures) and extrinsic factors (temp., RH, presence and concentration of gases) governing growth of microorganisms in food. **UNIT-III** Food spoilage: Chemical changes caused by microorganisms in foods (breakdown of proteins, carbohydrates, fats and other constituents during spoilage), specific microorganisms causing spoilage of milk and milk products, meat, fish, egg, cereals, fruits, vegetables and their processed products, quality defects in canned foods, sugar andconfectionary products, Antimicrobial substances in milk: immunoglobulin, lactoferin, lysozymes, LP systems etc. **UNIT-IV** Food fermentations: General description of fermenters, parts and their functions, different types of fermentations (static, submerged, agitated, batch, continuous). Microbial culture selection by screening methods and strain improvement. Starter cultures - definition, types, Fermentation - definition, types (acid, alcohol). Fermented foods types, methods of manufacture for vinegar, ethyl alcohol, cheese, yoghurt, baker's yeast and traditional Indian foods. PRACTICAL 1. Study and experiments with different microscopes. 2. Measurement of microorganisms. 3. Simple staining and Gram staining. 4. Sterilization techniques and equipments. 5. Preparation of culture media. 6. Isolation of microorganisms and Enumeration. 7. Growth of bacteria - Colorimetric method - Plating method. 8. Purification of bacteria. 9. Purification of fungi. 10. Detection of sources of contamination: air, water, utensils, equipment and personnel line testing 11. Enumeration of coliforms, yeasts and molds and total viable bacteria in fruits and vegetables, Dairyproducts 12. Enumeration of aerobic spore forming bacteria in food sample. 13. Estimation of alcohol content in fermented product 14. Isolation and identification scheme for detection of Salmonella in foods 15. Casein hydrolysis by microorganism on SMA 16. Starch hydrolysis by microorganism using starch agar 17. Evaluation of Starter Culture by Starter Activity Test 18. Assessment of surface sanitation by swab /rinse method and assessment of personnel hygiene by handwash 19. To study the given sample (milk) using Methylene blue reduction test (MBRT) 20. To find total viable bacteria and coliforms in water by membrane filtration technique 21. Evaluation of canned products for anaerobic spore formers 22. Spoilage of milk caused by microorganisms souring, sweet curdling, gassiness, lipolysis, ropiness, proteolysis and discoloration. 23. Detection of mastits milks, pH, SLST, somatic cell count, chloride content, Hotis test, CAMP test. Detection and estimation of coliforms; presumptive test, rapid coliform count, IMVIC test. Estimation of microbial load in milk by SPC and Dye reduction tests-(MBRT, RRT).		10+theory-30practical-30		

			24. Detection of antibiotic residues using qualitative test				

			24. Detection of antibiotic residues using qualitative test				
	BVFPS204T&P	INTRODUCTION TO COMPUTER APPLICATION	**UNIT I** Components of Computers – Hardware: Hardware elements – input devices, storage devices, processing & outputdevices. Block diagram of computer. Software concept. **UNIT II** Microsoft Word and its applications (in relation with Food Industry) - Font formatting, Paragraph formatting,Inserting images, auto shapes symbols, diagrams, header & footer, References, watermarks and Hyperlinks, Style & Formatting, Mail Merge through word, Access database. Page setup, Printing a document. Concept of files and folders. **UNIT III** MS Excel and its applications (in relation with Food Industry) - Making column chart & pie chart and chart formatting. Use of general functions & formula (autosum, using basic arithmetic operators: +,-,*,/), Use of filter& sorting, Cell references, header & footer, age setup, use of page break preview, printing worksheets. **UNIT IV** MS PowerPoint and its applications (in relation with Food Industry) - Creating own design, formatting objects ona slide, Use of Slide Master to control the design & formatting of a presentation, Use of Image, audio, video in the presentation, Slide show setup, slide transition, use of animation, Use of narration in presentation, Print setup & Printing handouts of a presentation. **UNIT V** Internet & Web Applications (in relation with Food Industry) **UNIT VI** Websites, Internet applications, Google Applications (G mail, Google search, G Drive, Google Docs) and other Email Services, Industry customer approach. **UNIT VII** Statistics: Data and Data Types: Primary data and Secondary Data, Measures of Central Tendency: Mean, Median, Mode. Dispersion: Range, Standard Deviation, Standard error, Kurtosis, Skeness. Hypothesis Testing:Chi-square Test, Student't' test, One Way Analysis of Variance (ANOVA). **PRACTICAL** 1. Typing practice (ability of typing without watching keyboard) 2. Use of Microsoft word and Excel with specific problem. 3. Tabular form of data presentation in computer. 4. Graphical presentation of data. 5. PowerPoint presentation. 6. Opening e-mail account and its different uses.	Apurba Giri	3(Class test 30+attendence +assignment-10+theory-60	4	4x15=60
	BVFPS205P	EXCURSION	Industrial visit	Aprba Giri	1	2	

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