

Name of the Subject: Industrial Management													
Course Code: FPT			Semester: Sixth					Credits: 3C					
Duration: 6 Semesters			Maximum Marks: 100					Subject Code: FPT/T601					
<p>Objective: This subject provides the students of polytechnics with an exposure to the art and science of management principles, functions, techniques and skills that are essential for maximising attainment of the organisational goals with the available manpower and resources. Upon successful completion of this subject, the students shall be equipped with the fundamental knowledge of management which should make them confident in facing the challenges of their responsibilities in the different organisational scenarios.</p>													
Teaching Scheme				Examination Scheme									
Theory	3Hours / Week		Internal Scheme	End Semester Examination									
Tutorial	Nil			Group	Unit	Objective Questions (Only MCQ/Fill in the Blanks/ True or False)				Subjective Questions			
Total Contact Periods	17 Weeks or 51 Hours		30	A		To Be Set	To be Answered	Marks Per Question	Total Marks	To Be Set	To be Answered	Marks Per Question	Total Marks
	Class Test	Contact Periods			1	3	Any 20	One	1 x 20 = 20	2	Any 5 at least 2 from each group	Ten	10 x 5 = 50
	3	48		2	6	2							
				3	6	2							
				B	4	6	2						
			5	4	2								
Detail Contents											Total Periods		
Unit – 1	INTRODUCTION TO MANAGEMENT SCIENCE Principles & functions of management — Contributions of F.W. Taylor, Henry Fayol, Max Weber and Elton Mayo & Roethlisburger in development of the theories of management science.										8		

Unit – 2	<p>ORGANISATIONAL BEHAVIOUR</p> <p>Objectives — Brief introduction to: Motivation & Morale – Perception – Leadership & Leadership Styles – Communication – Team Building – Work Culture.</p>	8
Unit – 3	<p>HUMAN RESOURCES MANAGEMENT</p> <p>Scope & Functions – Human Resources Planning – Selection & Recruitment – Training & Development – Performance Appraisal – Industrial Safety.</p>	8
Unit – 4	<p>PRODUCTION MANAGEMENT</p> <p>PRODUCTION PLANNING: Routing – Loading – Scheduling — PRODUCTION CONTROL: Expediting – Dispatching — Materials Handling — Work Study — Productivity — QUALITY MANAGEMENT: Tools & Techniques – Quality Management System.</p>	8
Unit - 5	<p>MATERIALS MANAGEMENT</p> <p>OBJECTIVES & FUNCTIONS: Purchase function – Stores function — INVENTORY MANAGEMENT: ABC, VED analyses.</p> <p>FINANCIAL MANAGEMENT</p> <p>Financial Ratios — Elements of Costing — Auditing</p>	8
Unit - 6	<p>MARKETING & SALES MANAGEMENT</p> <p>Objectives & Functions — Marketing of products & Services — Advertising & Sales Promotion — Consumer Behaviour</p> <p>QUANTITATIVE TECHNIQUES</p> <p>Linear programming (graphical method only) — NETWORK ANALYSIS: PERT – CPM</p>	8
	<p>REFERENCE BOOKS</p> <ol style="list-style-type: none"> 1. Essentials of Management / Kontz / McGraw-Hill of India 2. Organization & Behaviour / M. Banerjee / Allied Publishers 3. Human Behaviour at Work: Organizational Behaviour / Keith Davis & Newstrom / McGraw-Hill of India 4. Human Resources Management / Mirza Saiyatin / Tata McGraw-Hill 5. Production Management & Control / Nikhil Barat / U.N. Dhar & Co. 6. Production Management / Keith Lockyer / ELBS 7. Marketing Management / Philip Kotler / Prentice Hall of India 8. Lectures on Management Accounting / Dr. B.K. Basu / Basuri Bookstall, Kolkata 	

	<p>9. An Insight into Auditing: A Multi-dimensional Approach / Dr. B.K. Basu / Basusri Bookstall, Kolkata</p> <p>10. Business Strategies, Financial Management & Management Accounting / S.K. Poddar / The Association of Engineers (India)</p>	
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Name of the Subject: Food Packaging Technology													
Course Code: FPT		Semester: Sixth					Credits: 4C						
Duration: 6 Semesters		Maximum Marks: 100					Subject Code: FPT/T602						
Objective:													
This paper provides the safety of the product and preserves it in good condition for the anticipated shelf life. The package should also minimize product losses (waste) throughout the food handling and distribution chain. Food packaging is to hold the food quality – ideally in the condition in which it was prepared by the food manufacturer – until it is ready to be consumed. The quality of food is to be retained as much as possible during the time between period of release and time of use. It requires a combination of properties and/or characteristics and although each recognized packaging material possesses some of these, sadly no one material possesses them all. With a planned schedule of food production, storage and shipping time, the manufacturer have to design packaging method systems capable of delivering the food to the consumer with the level of acceptable quality expected by the consumer.													
Teaching Scheme			Examination Scheme										
Theory	4Hours / Week		End Semester Examination										
Tutorial	Nil		Internal Scheme	Group	Unit	Objective Questions (Only MCQ/Fill in the Blanks/ True or False)				Subjective Questions			
Total Contact Periods	17 Weeks or 68Hours					30	A	To Be Set	To be Answered	Marks Per Question	Total Marks	To Be Set	To be Answered
Class Test	Contact Periods	3	65	B	1			3	Any 20	One	1	Any 5 at least 2 from each group	Ten
					2		6	3					
				3	6		2						
				4	6		2						
				5	4	2							
Detail Contents											Total Periods		
Unit – 1	Introduction Introduction to Food Packaging: Definitions, types of packaging materials, manufacturing processes, Importance and scope functions of packaging, Factors responsible for the selection of Packaging materials for fresh and processed food products.										10		
Unit – 2	Packaging Materials and Properties Types, properties, advantages and disadvantages - <i>Primary Packaging Materials</i> (Paper and paper based packaging materials, Plastic as packaging materials); <i>Secondary Packaging Material</i> (Folding carton); <i>Transport packaging materials</i> (corrugated fiber board boxes, wooden boxes); <i>Ancillary Packaging Materials</i> (Printing inks, varnishes, lacquers and adhesives); <i>Glass packaging materials</i> Composition, structure, properties, Aluminium foil. <i>Metal packaging materials</i> . (Manufacture of tin plate, TFS, fabrication, corrosion and remedial measures)										15		
Unit – 3	Packaging Requirements										12		

	Packaging requirements of different types of foods : fruits and vegetables, meat, fish, poultry, dairy products, edible oils and spice products, bakery products, confectioneries, Instant foods, extruded foods, snack foods, alcoholic and non alcoholic, carbonated beverages.	
Unit – 4	<p>Machineries & Evaluation</p> <p>Packaging Machineries: Bottling, canning, capping, labeling, form- fill sealing, strapping, cartooning machineries. Package Evaluation: evaluation of mechanical, optical and barrier properties like WVTR, GTR, bursting strength, tensile strength, tearing strength, drop test.</p>	14
Unit - 5	<p>Packaging Systems and Regulations</p> <p>Packaging Systems: Vacuum and gas packaging, aseptic packaging, retort packaging, CAP and MAP, intelligent packaging, active packaging, shrink packaging, lined cartonning system, PET, TTI, Preform, tetrapack. Flash 18 processes. Biocomposite and alternative packaging.</p> <p>Packaging standards and regulations- laws, specifications and quality control; collection, separation, disposal and recycling of packaging materials.</p>	14
	<p>Reference Books:</p> <ol style="list-style-type: none"> 1. A Handbook of Food Packaging, Frank A. Paine, published by Blackie Academic 2. Food Packaging Materials, N.T.Crosby, published by Applied Science 3. Plastic Films for Packaging Technology, Calvin J. Bening, published by Technomic 4. Food Packaging Technology, Richard Coles, Derek McDowell, Mark J. Kirwan, Published by August 15, 2003 by Blackwell 5. Packaging of Food Beverages- F.T.Day 6. Food Packaging- Sacharow & Griffin 7. Flexible Packaging of Foods- A.L. Brody 8. Principle of food packaging- R. Heiss 	

Name of the Subject: Food Safety & Quality Control														
Course Code: FPT		Semester: Sixth					Credits: 4C							
Duration: 6 Semesters		Maximum Marks: 100					Subject Code: FPT/T603							
Objective: This paper provides a target for operational food safety management, leaving flexibility in the way equivalent food safety levels are achieved by different food chains. The concept helps to better relate operational food safety management to public health goals, i.e. to an appropriate level of protection. All concepts give guidance to food chains about the expected safety of food products and at the same time help food chains to design their food production and food safety management systems such that there is compliance with this expectation.														
Teaching Scheme			Examination Scheme											
Theory	4Hours / Week		Internal Scheme	End Semester Examination										
Tutorial	Nil			Group	Unit	Objective Questions (Only MCQ/Fill in the Blanks/ True or False)				Subjective Questions				
Total Contact Periods	17 Weeks or 68Hours		30	A		To Be Set	To be Answered	Marks Per Question	Total Marks	To Be Set	To be Answered	Marks Per Question	Total Marks	
	Class Test	Contact Periods				1	5	Any 20	One	1 x 20 = 20	2	Any 5 at least 2 from each group	Ten	10 x 5 = 50
	3	65			2	5	3				2			
				B	3	5	2							
					4	5								
			5		5									
Detail Contents											Total Periods			
Unit – 1	Introduction to Food Safety Definition, food safety issues and strategies [concept of food safety and standards (FSSAI)], factors affecting food safety, importance of safe foods, factors affecting shelf life and methods to check the shelf life. Food hazards and contaminations - biological (bacteria, fungus and parasites), chemical (toxic constituents / hazardous materials) pesticides residues / environmental pollution / chemicals) and physical factors. Prevention and control of microbiological and chemical hazards. Recent concerns on food safety: Genetically Modified Foods.										10			
Unit – 2	Food Analysis & Quality Evaluation Food Analysis: Objective and purpose of food analysis; food adulteration; Simple and quick method of adulteration detection. Sensory Evaluation: Definition, objectives, panel selection, sensory techniques, pros & cons, Sensory evaluation of food by subjective method- Difference tests, Sensitivity test, Rating test, Objective method- colour (Theory of spectrophotometer & colorimeter, selection of filter, Colour measurement , Colour specification), Brookefield Viscometer (Principle), Rheological properties of fruit juice and concentrate, Different textural attributes of food, Texture measurement instruments and unit of measurement, Instron testing machine), Chromatographic principle (HPLC), Atomic absorption spectrophotometer principle for measurement of heavy metals .										15			

<p>Unit – 3</p>	<p>Statistical Quality Control Basic concepts, uses, limitations, applications of statistics in food quality control. Types of data, data collection methods. <i>Data presentation</i> (tables, frequency distributions), <i>Graphical presentation of data</i> (histogram, bar diagrams, line diagram, frequency polygon), <i>Measures of central tendency</i> (Mean, Median, Mode.), <i>Measures of dispersion</i> (range, quartile deviation, mean absolute deviation, standard deviation, coefficient of variation), <i>Measures of skewness & Kurtosis. Control Charts. Sampling</i> (Definition of sampling, purpose, sampling techniques, requirements and sampling procedures). <i>Hypothesis testing</i> [Concepts of Hypothesis, Degrees of freedom, Level of significance, confidence level, Type I and Type II errors. Applications of t-test, z-test, F-test, Chi square test.</p>	<p>20</p>
<p>Unit – 4</p>	<p>Food Legislations & Standards National Food Legislations: PFA, FPO, MPO, BIS, AGMARK, ISI, Misbranding, Enforcement, Essential Commodities Act, 1954; Consumer Protection Act, 1986. International Food Legislations: FAO, WHO Codex Alimentarius, Codex India, JECFA (Joint FAO/WHO Expert Committee on Food Additives), WTO, SPS (Sanitary and Phytosanitary Measures), TBT (Technical Barriers to Trade), ISO (International Organization for standard)</p>	<p>15</p>
<p>Unit - 5</p>	<p>Quality Standards GMP, GHP, HACCP, GAP, ISO Series (9000, 22000, 14000 & 17025.)</p>	<p>5</p>
	<p>Reference Books: 1. Food Safety and Quality Assurance: Foods of Animal Origin, William T. Hubbert , Wiley-Blackwell; 2nd Edition Edition (1 January 1996) 2. Food Quality Assurance: Principles and Practices, <u>Inteaz Alli</u>, CRC Press, 27-Aug-2003 3. Quality Assurance for the Food Industry: A Practical Approach , <u>J. Andres Vasconcellos</u>, CRC Press, 29-Dec 2003</p>	

Name of the Subject: Food Industries Waste Management													
Course Code: FPT			Semester: Sixth					Credits: 4C					
Duration: 6 Semesters			Maximum Marks: 100					Subject Code: FPT/T6041					
Objective:													
<ul style="list-style-type: none"> ➤ Waste reducing in the targeted food industry sectors ➤ Improving water quality of receiving water bodies (lakes and rivers) through better treatment performance in the WWTPs ➤ Reducing the “ecological footprint” of the complete wastewater treatment process in the food industry ➤ Facilitating access of SMEs to innovative "green" knowledge, increasing awareness and promoting networking ➤ Reducing disposal costs for sewage sludge ➤ Reducing costs for polymers for sludge dewatering ➤ Reducing energy costs ➤ Reducing pollution fees 													
Teaching Scheme			Examination Scheme										
Theory	4Hours / Week		End Semester Examination										
Tutorial	Nil		Internal Scheme	Group	Unit	Objective Questions (Only MCQ/Fill in the Blanks/ True or False)				Subjective Questions			
Total Contact Periods	17 Weeks or 68 Hours		30	A		To Be Set	To be Answered	Marks Per Question	Total Marks	To Be Set	To be Answered	Marks Per Question	Total Marks
	Class Test	Contact Periods			1	3			1 x 20	2	Any 5 at least 2		10 x 5
	3	65		B	2	6	Any 20	One	=	2	from each	Ten	=
					3	6			20	2	group		50
					4	6				2			
					5	4				2			
Detail Contents												Total Periods	
Unit – 1	Waste Treatment Parameters Constituents of suspended solids, volatile suspended solids, MLVSS, BOD, COD, Dissolve oxygen, Analytical determination of BOD, COD and DO, Mathematical model for BOD, BOD curve Stream Pollution & Measurement Nature of stream pollution, Oxygen sag curve, Oxygen sag equation and industrial problems based on oxygen sag equation											6	
Unit – 2	Fundamental of physical treatment Objective of physical treatments, screening, flow equalization, mixing and flocculation, gravity separation, grit removal, sedimentation, Ideal sedimentation tank concept, high-rate clarification, flotation, aeration system. (no design principle only) Fundamental of Chemical treatment											16	

	<p>Objective of chemical treatments, chemical coagulation, chemical precipitation, chemical oxidation, chemical neutralization and stabilization.(no design principle only)</p> <p>Fundamentals of biological treatment</p> <p>Objective of biological treatment, Types of biological process, Microbial growth kinetics, Substrate utilization kinetics, Aerobic biological oxidation, Biological nitrification and denitrification, Biological phosphorous removal, Anaerobic biological oxidation, Biological removal of toxic, recalcitrant organic compound and heavy metals. (no design principle only)</p>	
Unit – 3	<p>Biological Treatment unit</p> <ul style="list-style-type: none"> ➤ Activated sludge process and advantage (No design model) ➤ Rotating biological contractors and its advantage and disadvantage (No design model) ➤ Aerated lagoon – principle, application, advantage, residence time in aerated lagoon, brief discussion on stabilization pond(no problem) ➤ Trickling filter (only principle, application, advantage) ➤ Facultative pond, Oxidation ditch, aerobic pond, Biofilters and Bioclarifiers ➤ Anaerobic suspended and attached growth biological treatment process- Anaerobic contact process, anaerobic sludge blanket process, attached growth anaerobic process, (only principle, application,) 	20
Unit – 4	<p>Industrial Waste Treatment</p> <p>Classification and characterization of food industrial wastes from Fruit and Vegetable processing industry, Beverage industry; Fish, Meat & Poultry industry, Sugar industry and Dairy industry; Waste disposal methods – Physical, Chemical & Biological; Economical aspects of waste treatment, reuse and recycling. (only principle, application,)</p>	15
Unit - 5	<p>Solid Waste Treatment</p> <p>Source and characteristics of solid wastes, Preliminary operation, thickening, stabilization, anaerobic digestion, aerobic digestion, composting, Vermicomposting conditioning, dewatering, heat drying, incineration, disposal and landfilling. (only principle, application,)</p>	8
	<p>Reference Books</p> <ol style="list-style-type: none"> 1. Waste treatment engineering / H.J. Hammer 2. Waste treatment / Eddy & Metcafe 3. Environmental Science / J. Turk & A. Turk 	

	<ol style="list-style-type: none">4. Environmental Pollution / Dix Pollution Control Acts, Rules and Notification / Central Pollution Control Board, New Delhi5. Water supply and wastewater engineering- B.S.Raju6. wastewater engineering- Jain and Jain7. Water supply and sanitary engineering- Birdie and birdie	
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Name of the Subject: Fermentation Technology													
Course Code: FPT			Semester: Sixth					Credits: 4C					
Duration: 6 Semesters			Maximum Marks: 100					Subject Code: FPT/T6042					
Objective:													
This paper provides the knowledge of basic principle of fermentation process, which helps students to design, develop and operate industrial level fermentation process. This fundamental knowledge is essential for the students to make their career in industry based on bioprocess.													
Teaching Scheme			Examination Scheme										
Theory	4Hours / Week		End Semester Examination										
Tutorial	Nil		Internal Scheme	Group	Unit	Objective Questions (Only MCQ/Fill in the Blanks/ True or False)				Subjective Questions			
Total Contact Periods	17 Weeks or 68 Hours		30	A		To Be Set	To be Answered	Marks Per Question	Total Marks	To Be Set	To be Answered	Marks Per Question	Total Marks
	Class Test	Contact Periods			1	3			1 x 20	2	Any 5 at least 2	Ten	10 x 5
	3	65		B	2	6	Any 20	One	=	2	from each group		=
					3	6			20	2			50
					4	6				2			
					5	4				2			
Detail Contents												Total Periods	
Unit – 1	Introduction to Fermentation Technology Concepts about fermentation, Culture preservation, Criteria used for the selection of microorganisms for fermentation; Methods of culture maintenance, Cultures maintenance by storage with limited metabolic activity.											5	
Unit – 2	Fermenter Design Basic functions of Fermenters, Types of Fermenters (or Bioreactor) – Fluidized Bed Bioreactor, Loop or Air Lift Bioreactor, Membrane Bioreactor, Pulsed Column Bioreactor, Bubble Column Bioreactor, Photo Bioreactor, Packed Tower Bioreactor; Construction of Fermenters, Design and Operation of Fermenters.											12	
Unit – 3	Fermentation Process Types, Model of Batch (Stoichiometry of cell growth. Monod's Growth kinetics, Specific growth rate, growth yield, production yield, Y _g , Y _{o2} , Y _{atp} , Saturation constant, maintenance energy, Transient growth); Model of Fed-Batch and Model of Continuous (chemostat, chemostat with recycle, turbidostat), Scale-up of Fermentations. Overview of aerobic and anaerobic fermentation processes and their application in food processing industry, Solid substrate and submerged fermentation and its application.											20	

Unit – 4	Fermentative Production of Different Products Fruits & Vegetable products, Cereal Based Products, Primary & Secondary Metabolites, Alcoholic Beverages	13
Unit - 5	Down stream processing Pretreatment (cell disruption and flocculation); Solid liquid separation (filtration, sedimentation and centrifugation); Concentration (membranes, salt and solvent precipitation, evaporation, liquid – liquid extraction, distillation); Purification (precipitation, chromatography, adsorption and elution); Formulation (drying, extrusion, granulating and tableting.)	15
	Reference Books: 1. Principles of Fermentation Technology, P F Stanbury Dr. A Whitaker 2. Fermentation Technology, <u>M. L. Srivastava</u> , Alpha Science Intl Ltd (October 24, 2007) 3. Fermentation Microbiology and Biotechnology, Second Edition, E. M. T. El-Mansi, C. F. A. Bryce, Arnold L. Demain, A.R. Allman, CRC Press, 25-Oct-2006	

Name of the Subject: Food Analysis & Quality Control Laboratory - II			
Course Code: FPT	Semester: Sixth	Credits: 2C	
Duration: 6 Semesters	Maximum Marks: 100	Subject Code: FPT/P605	
Objective:			
Teaching Scheme		Examination Scheme	
Practical	4 Hrs/Week	Internal Scheme	External Scheme
Tutorial	Nil	Continuous Internal Assessment of 50 marks is to be carried out by the teachers throughout the Second Year First Semester. Distribution of marks: Performance of Job – 35, Notebook – 15.	External Assessment of 50 marks shall be held at the end of the Second Year First Semester on the entire syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by lottery system. Distribution of marks: On Spot Job – 25, Viva-voce – 25.
Total Periods	15 Weeks or 60 Hrs		
Sl.No.	Detail Contents		
1.	Analysis of cereals and pulses product		
2.	Analysis of tea and coffee		
3.	Analysis of tomato product		
4.	Analysis of species product		
5.	Identification of Coal-Tar dyes (Acidic) in food sample by Dyeing wool method		
6.	Identification of Caramel, Cochineal, Turmeric, Annatto dye in fruit/vegetable or their products.		
7.	Analysis of lysine content in animal /vegetable sources.		
8.	Qualitative identification of adulteration in dairy products		
9.	Qualitative identification of adulteration in edible oils and fats		
10.	Qualitative identification of adulteration in cereals, pulses and species		

Name of the Subject: Food Processing Laboratory - II			
Course Code: FPT		Semester: Sixth	Credits: 2C
Duration: 6 Semesters		Maximum Marks: 100	Subject Code: FPT/P606
Objective:			
Teaching Scheme		Examination Scheme	
Practical	4 Hrs/Week	Internal Scheme	External Scheme
Tutorial	Nil	Continuous Internal Assessment of 50 marks is to be carried out by the teachers throughout the Second Year First Semester. Distribution of marks: Performance of Job – 35, Notebook – 15.	External Assessment of 50 marks shall be held at the end of the Second Year First Semester on the entire syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by lottery system. Distribution of marks: On Spot Job – 25, Viva-voce – 25.
Total Periods	15 Weeks or 60 Hrs		
Sl.No.	Detail Contents		
1.	Development of orange squash and marmalade.		
2.	Development of different types of Tomato product (sauce, ketchup, puree etc)		
3.	Development of Fermented fruits and vegetable product		
4.	Development of oyster mushroom and mushroom pickle		
5.	Development of Fermented cereal and pulses products		
6.	Examine the milling characteristic of parboiled rice		
7.	Development of wheat milling product		
8.	Extraction of oils from oilseed and soybean seed		
9.	Development of dry species powder		
10.	Development of carbonated beverage		

Name of the Subject: Elective Laboratory (Food Industries Waste Management Lab)			
Course Code: FPT		Semester: Sixth	
Duration: 6 Semesters		Maximum Marks: 100	
		Credits: 2C	
		Subject Code: FPT/P607	
Objective:			
Teaching Scheme		Examination Scheme	
Practical	4 Hrs/Week	Internal Scheme	External Scheme
Tutorial	Nil	Continuous Internal Assessment of 50 marks is to be carried out by the teachers throughout the Second Year First Semester. Distribution of marks: Performance of Job – 35, Notebook – 15.	External Assessment of 50 marks shall be held at the end of the Second Year First Semester on the entire syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by lottery system. Distribution of marks: On Spot Job – 25, Viva-voce – 25.
Total Periods	15 Weeks or 60 Hrs		
Sl.No.	Detail Contents		
1.	To determine the turbidity of wastewater by turbidity meter.		
2.	To determine the electrical conductivity of wastewater		
3.	To determine the solid content of wastewater		
4.	To determine the acidity and alkalinity of wastewater		
5.	To determine the chloride and sulphate content of wastewater		
6.	To determine BOD and COD of wastewater		
7.	To determine total nitrogen content (TKN) of wastewater		
8.	To determine phosphate content of wastewater		
9.	To determine coliform group and fecal coliform group in wastewater by MPN method		
10.	To determine hardness of water sample		

Name of the Subject: Elective Laboratory (Fermentation Technology)			
Course Code: FPT		Semester: Sixth	
Duration: 6 Semesters		Maximum Marks: 100	
		Credits: 2C	
		Subject Code: FPT/P607	
Objective:			
Teaching Scheme		Examination Scheme	
Practical	4 Hrs/Week	Internal Scheme	External Scheme
Tutorial	Nil	Continuous Internal Assessment of 50 marks is to be carried out by the teachers throughout the Second Year First Semester. Distribution of marks: Performance of Job – 35, Notebook – 15.	External Assessment of 50 marks shall be held at the end of the Second Year First Semester on the entire syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by lottery system. Distribution of marks: On Spot Job – 25, Viva-voce – 25.
Total Periods	15 Weeks or 60 Hrs		
Sl.No.	Detail Contents		
1.	Fermentative production and purification of alcohol from molasses		
2.	Fermentative production and purification of lactic acid		
3.	Fermentative production and purification of L-glutamic acid		
4.	Fermentative production and purification of enzyme		
5.	Fermentative production and purification of antibiotics		
6.	Fermentative production of alcoholic beverage		

Name of the Subject: Food Processing Project Work - II			
Course Code: FPT		Semester: Sixth	
Credits: 2C			
Duration: 6 Semesters		Maximum Marks: 100	
		Subject Code: FPT/P608	
<p>Objective: Project Work-II is intended to provide opportunity for students to develop understanding of the interrelationship between different courses learnt in the entire diploma programme and to apply the knowledge gained in a way that enables them to develop & demonstrate higher order skills. The basic objective of a project class would be to ignite the potential of students' creative ability by enabling them to develop something which has social relevance, aging, it should provide a taste of real life problem that a diploma-holder may encounter as a professional. The course further includes preparation of a Project Report which, among other things, consists of technical description of the project. The Report should be submitted in two copies, one to be retained in the library of the institute. The Report needs to be prepared in computer using Word and CADD software wherever necessary.</p> <p>Seminar on Project Work-II is intended to provide opportunity for students to present the Project Work in front of a technical gathering with the help of different oral, aural and visual communication aids.</p>			
Teaching Scheme		Examination Scheme	
Practical	4 Hrs/Week	Internal Scheme	External Scheme
Tutorial	Nil	Continuous Internal Assessment of 50 marks is to be carried out by the teachers throughout the Second Year First Semester. Distribution of marks: Performance of Job – 35, Notebook – 15.	External Assessment of 50 marks shall be held at the end of the Second Year First Semester on the entire syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by lottery system. Distribution of marks: On Spot Job – 25, Viva-voce – 25.
Total Periods	15 Weeks or 60 Hrs		
Sl.No.	Detail Contents		
1.	Development of meat and fish product.		
2.	Quality enhancement in frozen food.		
3.	Quality enhancement in dried and osmo-dried food products.		
4.	Design of waste treatment process for waste handling in different food industries.		
5.	Up gradation of local dairy unit under quality perception.		
6.	Development of quality enriched Sweetmeat product.		
7.	Up gradation of local rice mill unit under quality perception.		
8.	Up gradation of local oil mill unit under quality perception.		

Name of the Subject: Professional Practice – IV (Food Plant Layout & Design)		
Course Code: FPT	Semester: Sixth	Credits: 1C
Duration: 6 Semesters	Maximum Marks: 50	Subject Code: FPT/P609
Objective:		
Teaching Scheme		Examination Scheme
Term Work	2 Hrs/Week	Term Work (Internal Scheme)
Tutorial	Nil	Continuous Internal Assessment of 50 marks is to be carried out by the teachers throughout the Second Year First Semester. Distribution of marks: Performance of Job – 35, Assignments – 15.
Total Contact Periods	15 Weeks or 30 Hrs	
Sl.No.	Detail Contents	
	To developed layout and design of plant machineries required in different types of food processing industries.	

Name of the Subject: Grand Viva Voce		
Course Code: FPT	Semester: Sixth	Credits: 2C
Duration: 6 Semesters	Maximum Marks: 100	Subject Code: FPT/P609
Objective:		
Teaching Scheme		Examination Scheme
Term Work	Nil	
Tutorial	Nil	The Final Viva-Voce Examination shall take place at the end of the Part – III Second Semester. It is to be taken by one External and one Internal Examiner. The External Examiner is to be from industry / engineering college / university / government organisation and he / she should give credit out of 50 marks ; whereas, the Internal Examiner should normally be the Head of the Department and he / she should give credit of 50 marks . In the absence of the Head of the Department the senior most lecturer will act as the Internal Examiner.
Total Contact Periods	Nil	
Detail Contents		
Sl.No.	The syllabi of all the theoretical and sessional subjects taught in the three years of diploma education.	