Sem I Paper 1
BvFt 101: Food Science (3 Credits-45 Lectures)

S.No	Title	Lectures (45L)
1	**Unit I : Introduction of food Science**	**8**
	Introduction & definition of Food Science; Palatability of food and measurement of acceptance by :I)testing ii)appearance iii)smell iv)test; Five Food Groups and Food guide, relationship between food and nutrition, functions of food, classification of nutrients, factors affecting food consumption and food acceptance. Food Preparation- Reasons for cooking, pre-preparation of foods, methods of cooking, medium of cooking, changes during cooking.	
2	**Unit II: Basics of Food Requirement**	**10**
	Food requirements - Consumer safety – Objectives of food science – Constituents of food – Food as a source of energy – Energy requirement in human body – Food health and disease.	
	Water – Role of water – Dietary requirements and sources – Important Physical properties of water – Concept of water activity	
3	**Unit III: Composition and nutritive value of plant foods**	**12**
	Cereals: General outline, Composition & Nutritive value, Structure of wheat and Rice	
	Pulses & Legumes: Composition, Nutritive value, Anti nutritional factors Changes during cooking, Factors affecting cooking time, Germination, Changes during germination.	
	Nuts & Oilseeds: Composition, sources of proteins and oil, Processing of oil seeds - Soya bean, coconut, Protein isolates, Texturized vegetable protein.	
	Fruits & Vegetables: Composition, Classification, Nutritive value, Vegetable Cookery, Changes during cooking, Ripening, Climacteric, Non Climacteric fruits, Changes during ripening.	
	Spices: Definition, Classification, Chemical composition, use of spices	
4	**Unit IV: Composition and Nutritive Value of Animal Foods**	**10**
	Eggs: Structure, Composition, Nutritive value, Grading Changes during storage.	
	Fish: Composition, Nutritive value	
	Meat: Structure, Composition, Nutritive value	
	Milk & milk products; Classification & properties of sugar; fats, oil & nuts; Spice & beverages & their roles.	
5	**Unit IV: Health Foods**	**5**
	Functional foods, Prebiotics, Probiotics, Nutraceuticals, organic foods, GM foods	

REFERENCES BOOKS

1) B. Sivasankar "Food processing and preservation", Prentice – Hall of India Pvt. Ltd. 2002.
2) Potter, N. N. and Joseph, H. Hotchkiss, "Food Science", CBS Publishers and distributors, New Delhi, 1996.
3) Fox, B. A. and Cameron, A.G., "Food Science, Nutrition and Health", 5th ed., Edward Arnold, London
4) Charley, H., Food Science, John Wiley and Sons Inc., New York, 1982.
5) Birch, G.G., Brennan, J. G. and Parker, K. J., The Sensory Properties of Foods, Applied Science Pub., London, 1977.-
6) Robinson, D. S., Food – Biochemistry and Nutritional Value, Longman Scientific and Technical, London, 1987.
7) Foods: Facts and Principles - N Shakuntalamanay M Shadakshara Swamy
8) Food Science - B Srilakshmi
9) Food science, Chemistry & Experimental Foods - M Swaminathan, Kukude, S and others.
10) Food Science, Sheth Publications.
11) Mudambi and Sheela Rao: Food science
12) Marion Benion & Hughes: Introductory Foods, Macmillan 'ew YORK
13) Thangam Phillip: Modern Cookery
14) Srilaxmi: Food Science, New Age International
15) Usha Raina: Basic Food Preparation
16) Shakuntala Manay: Foods Facts and Principles, Wiley Eastern

Sem I Paper 2
BvFt 102 : Fundamentals of Microbiology (3 Credit)

Sr. No	Content	Lectures (45L)
1	**Introduction to Microbiology** History and Development of Microbiology, Definition and Scope of food microbiology, Inter-relationship of microbiology with other sciences	**5**
	Methods in microbiology.: a) Introduction to instruments and equipments needed in Microbial studies., b) Colony formation patterns, Biofilm formation. Wet mount and dry mount. Staining Techniques (Monochrome, Negative, Differential, Special staining) c) Cultivation – *In vitro and in Vivo* Concept of Pure culture, co-culture and Mixed, culture. Design of media : Composition, Sterlisation.Preservation and Maintenance, Methods for microbial cultures.	**15**
2	**Microbial Growth** Growing Microorganisms in laboratory. Factors affecting microbial growth. Isolation and purification of Microorganisms.	**10**
3	**Microbial Food Spoilage** Sources of Microorganisms in foods Some important food spoilage bacteria Changes caused by micro-organisms during spoilage (breakdown of proteins, carbohydrates, fats and other constituents) Spoilage of specific food groups- Milk and dairy products, Meat, poultry and seafoods, Cereal and cereal products, Fruits and vegetables and Canned products.	**7**
4	**Control of Microbial growth in Food** Principles and methods of preservation Physical Methods of Food Preservation- Dehydration, Freezing, Cool Storage, Heat Treatment (esp. thermobacteriology), Irradiation, Chemical Preservatives Biopreservatives esp. Bacteriocins New Non Thermal methods Introduction to Hurdle concept and Predictive Microbiology	**8**

References

1) General Microbiology - Stanier, 5th ed.
2) Introduction to Microbiology - Ingraham, 2th ed.
3) Brock Biology of Microorganisms - Madigan et al, 9 th ed.
4) Industrial Microbiology - An introduction, Waites, M.J.

Sem I Paper 3
BvFt 103: Food Chemistry and Nutrition (3 credits)

S. No	Title	Lectures (45L)
1	**Unit I**	5
	Carbodydrates: Monosaccharides: **C**lassification and properties - Glucose, Fructose, ribulose, ribose	
	Disaccharides: Maltose, Lactose, Sucrose Polysacharides: Starch, Cellulose,Glycogen, Gums, Pectin	
2	**Unit II**	8
	Amino acids - Classification , properties and identification	
	techniques, Isoelectric points of amino acids, Amino acids - Classification and structure, properties and identification techniques, Isoelectric points of amino acids,	
	Formation of peptide linkages, biological activity,	
	Qualitative analysis of protein, Protein estimation-Kjeldahl's method	
3.	**Unit III**	10
	Lipids: Classification, Fatty acids: Saturated, Unsaturated, Polyunsaturated fatty acids, Rancidity, Characteristics,Physical properties-melting point, softening point, specific gravity, refractive index, smoke, flash and fire point, turbidity point. Chemical properties-reichert meissel value, polenske value, iodine value, peroxide value, saponification value. Effect of frying on fats, Changes in fats and oils- rancidity, lipolysis, flavor reversion, Auto-oxidation and its prevention Technology of edible fats and oils- Refining, Hydrogenation and Interesterification	
4.	**Unit IV**	16
	Concept of Nutrition Definition of terms Nutrition, Under nutrition, Mal nutrition and balanced diet, Basic food groups, Digestion and absorption of basic nutrients Energy: Definition of calorie & Joule Measurement of calorific value of food Basic nutrients: Source, requirements and deficiencies of carbohydrates , lipids Protein, Evaluation of protein quality Vitamins & Minerals: Structure ,Importance and Stability, Water soluble vitamins, Fat soluble vitamins, Classification, sources, function, requirements and deficiency	
5	**Flavour:** Definition and basic tastes, Chemical structure and taste, Description of food flavours, Flavour enhancers	6

References

1. Food and Nutrition M. Swaminathan
2. Fundamentals of Food & Nutrition S R. Mudambi, M.V. Rajagopal
3. A text book of foods, Nutrition and Dietetics M. Raheena Begum
4. Handbook of Food and Nutrition M Swaminathan
5. Food Chemistry O R. Fennema
6. Food Chemistry L H Meyer
7. Foods Facts and Principles N. Shakuntalamanay & M. Shadaksharaswamy
8. Food Science Norman N. Potter
9. Hand book of Analysis and Quality Control of Fruits & Vegetable Products S. Ranganna
10. Fats in Food Technology K K Rajah

Sem I Paper 4
BvFt 104: Food Processing and engineering (3 Credits)

S.No	Title	Lectures 45L
1	**Unit I: Introduction and Processing methods**	**5**
	Basic Principles of food processing, Dimensions and units, Dimensional Consistency, Conservation of mass and energy.	
	Heating, Blanching and Pasteurization. Freezing, Dehydration, canning, additives, fermentation, extrusion cooking, hydrostatic pressure cooking	
2	**Unit II: Drying**	**8**
	Moisture content, definition, methods of determination, Direct and indirect methods. Equilibrium moisture content, properties of air, water, vapour mixer.	
	Drying, mechanisms, constant rate period and falling rate period, methods and equipment used, factors affecting rate of drying.	
3	**Unit III: Food Conversion Operation**	**7**
	Size reduction, Fibrous foods, dry foods and liquid foods, Theory and equipment, membrane separation filtration, equipment and application.	
4	**Unit IV: Food Preservation by Cooling**	**5**
	Refrigeration, Freezing, freezing time, methods of freezing, freezing equipment, freeze drying, freeze concentration, thawing, effect of low temperature on food.	
5	**Unit V: Vessels& Agitators**	**5**
	Brief design and drawing of enclosures, supports and standard flanges	
	Brief design and drawing of various types of agitators used in Food process equipment.	
6	**Unit VI: Heat Exchangers& Evaporators**	**5**
	Brief design and drawing of various types of heat exchangers & Evaporators employed in Food processoperation.	
7	**Unit VII: Dryers**	**5**
	Brief design and drawing of dryers used in Food process operation.	
8	**Unit VIII: Crystallizers**	**5**
	Brief design and drawing of crystallizers used in Food process operation.	

References:

1. Introduction to food engineering. R. Paul Singh. 2000. Academic Press. B.
2. P.Fellows.1988. Food Processing Technology.Principles and practice.Ellis Horwood International publishers, Chichester, England.
3. Sinnott, R.K., Coulson & Richardson's "Chemical Engineering", Volume 6, 3rd Edn., Butterworth Heinemann, New Delhi, 1999.
4. Food Process Engineering by Dennis,R.H.
5. Engineering properties of foods by Rao, M.A. and Rizvi, S.S.H.40 FP – 07,08 – SRM – E&T
6. Perry, R.H., et al., Perry's "Chemical Engineers Handbook", 7th Edn., McGraw Hill, NewYork, 1997.
7. Joshi, M.V., and Mahajani, V.V., "Process Equipment Design", 3rd Edn., Macmillan India Limited, NewDelhi, 1996.
8. Bownell, L.E., and Young, E.M., "Process Equipment Design", Wiley Eastern, 1968.

Sem I Paper 5
BvFt 105: Value Education (1 Credit)

Sr. No.	Value Education (1 credit)	Lectures (15L)
1	Value Education—Introduction – Definition of values – Why values? – Need for Inculcation of values – Object of Value Education – Sources of Values – Types Values: Personal values, Social values, Professional values Moral and spiritual values, Behavioral (common) values	3
2	Personal values – Definition of person – Self confidence – Self discipline – Self Assessment – Self restraint – Self motivation – Determination – Ambition – Contentment – Humility and Simplicity - Sympathy and Compassion – Gratitude -Forgiveness – Honesty – Courtesy.	3
3	Social values – Definition of Society – Units of Society - Individual, family, different groups – Community – Social consciousness – Equality and Brotherhood – Dialogue – Tolerance – Sharing – Responsibility – Cooperation Freedom – Repentance and Magnanimity.	3
4	Professional values – Definition – Competence – Confidence – Devotion to duty –Efficiency – Accountability – Respect for learning /learned – Willingness to learn-Open and balanced mind – Team spirit – Professional Ethic – Willingness for Discussion – Aims – Effort – Avoidance of Procrastination and slothfulness –Alertness.	3
5	Behavioral values – Individual values and group values – Good manners at home and outside – Equality – Purity of thought, speech and action – Understanding the role of religion – Faith – Understanding the commonness of religions – respect for other faiths – unity in diversity – Living together – Tolerance – Nonviolence – Truthfulness – Common aim – Unified effort towards peace – Patriotism	3

REFERENCE BOOKS:

1. Dr. S. Ignacimuthu S. J., *"Values for life"*, Better yourself Books, Bandra Mumbai-600 050 (1999).
2. *"Values(Collection of Essays)"*., Published by : Sri Ramakrishna Math., Chennai—4.,(1996)
3. Prof. R.P.Dhokalia., "*Eternal Human Values*", NCRT –Campus Sri Aurobindo Marg., New Delhi - 110 11.
4. Swami Vivekananda., "*Education*", Sri Ramakrishna Math., Chennai-4(1957)
5. "*Tirukural*" (English Translation by Dr.G.U.Pope).
6. "*The Bible*"
7. "*The Kuran*"
8. "*The Bagavath Geetha*"

Sem I Practical 1
BvFt 106: Practicals of Food Science (3 Credits)

Sr. No.	Practicals of Food Science (3 Credits)	Lectures (15L)
1	Microscopic structure of food starches (raw and cooked)	1
2	Gelatinization properties of food starches	1
3	Determination of relative density of milk at different temperatures	1
4	Effect of salt, acid, sugar and fat on the stability of egg white foam	1
5	Effect of preparation techniques on meat tenderization	1
6	Effect of roasting on nuts and oilseeds	1
7	Inversion, Melting and caramelization of sugar	1
8	Determination of smoking point, absorption of oil and changes in physical parameters of fats and oils.	1
9	Preparation of brix solution and checking by hand refractometer	1
10	Estimation of reducing sugar by Fehlings procedure	1
11	Estimation of salt content in butter	1
12	Estimation of protein content by formol titration Qualitative test for Protein – Ninhydrine reaction, Xanthoproteic test, Biuret test.	1
13	Determination of acidity of water and alkalinity/ hardness of water	1
14	Determination of Moisture using) Hot air oven b) . Distillation method c). Infrared method	1
15	Qualitative test for carbohydrates – Molisch's test, Benedict's test, Iodine test, Anthrone test, Selivanoff's test.	1

REFERENCE

1.MohiniSethi and Eram S. Rao (2005) Food Science Experiments and Applications, CBS Publishers & Distributors, New Delhi.

2. Pomeranz, Y.(Ed), (1991), Functional properties of food components, (2nd edition),Academic press, New Delhi

3. Bowers, J. (1992): Food theory and applications, (2nd edition), Macmillan Publishing co., New Delhi

Sem I Practical 2
BvFt 107: Practical of Microbiology (3 Credits)

Sr.No	Content	Practical (15P)
1	Introduction to the Basic Microbiology Laboratory and Equipments	1P
2	Handling of compound microscope	1P
3	Cleaning and sterilization of glassware	1P
4	Aseptic transfer Techniques	1P
5	Cultivation and sub-culturing of microbes p reparation and sterilization of nutrient medium	2P
6	Morphological study of bacteria and fungi using permanent slides	2P
7	Monochrome staining	1P
8	Gram's staining	1P
9	Endospore staining	1P
10	Isolation and characterization of Microorganism from food sample	2P
11	.Enumeration of Microorganism from different food samples Direct Microscopic count, Spread plate technique , Pour plate technique	2P

Sem I Practical 3

BvFt 108: Practical for in Food Chemistry and Nutrition (3 Credits)

S.No	Title	Practical (15P)
1.	Colour reactions of carbohydrates	1
2.	Estimation of reducing sugar	1
3.	Colour reactions of proteins	1
4	Determination of acid value and free fatty acid in oils.	2
5	Determination of pH and acidity of different fruit juices.	1
6	Estimation of ascorbic acid	1
7	Estimation of protein by Lowry method.	1
8	Determination of Ash content.	2
9	Determination of Gluten content in wheat flour.	1
10	Determination of Water absorption power of Maida	1
11	Estimation of moisture content	1
12	Estimation of reducing and non-reducing sugars using potassium ferricyanide method.	1

References

1. FoodChemistry Owen R Fennema

2. Food Chemistry Lillian Hoagland Meyer

3. Foods Facts and Principles N Shakuntalamanay, M Shadaksharaswamy

4. Food science Norman N. Po

Sem I Practical 4
BvFt 109: Practicals in Food Processing and Engineering (3 Credit)

S.No	Title	Practical (15P)
1	Determination of physical properties of foods.	1
2	Determination of mechanical properties of foods.	1
3	Determination of texture properties of foods	1
4	Experiments on centrifugal separation (cream separator)	1
5	Experiments on oil extraction by soxhlet apparatus	2
6	Experiments of microwave heating of food materials	2
7	Experiments on hygroscopic properties of food materials	1
8	Experiments on biochemical properties of foods.	1
9	Experiments on determination of drying rate of given food materials	1
10	Experiments on microwave cooking	1
11	Experiments on freezing of foods	1
12	Experiments on determination of firmness of foods	1
13	Experiments on determination of physical properties of foods.	1

REFERENCE BOOKS

1. Earle R.L., "Unit operations in Food Processing", Pergamon Press.
2. Unit Operations in food engineering. Gustavo.V. 2003. CRC Press
3. McCabe, W.L. and Smith.J.C. "Unit Operations of Chemical Engineering", McGraw-Hill, 1976.
4. Magnard Joslyn, "Food Processing Operations", AVI Publishing Company.Food Process Design. Zacharias.B. 2003. CRC Press.

Sem II Paper 1
BvFt 201: Food Biochemistry (3 Credits)

Sr. No	Title	Lectures (45L)
1.	**Unit I : Carbohydrates**	**12**
	Chemistry of carbohydrates - Definition, classification, importance,	
	Monosaccharides-glucose, fructose,ribose, ribulose; functions and properties-Disaccharides-maltose, lactose, sucrose. Oligo saccharides-raffinose.	
	Polysaccharides-starch, cellulose, pectins, seed gum, sea weed and algal polysaccharides (application only).	
	Dietary sources – Functional properties of dietary carbohydrates.	
2.	**Unit II: Fats and Oils**	10
	Definition and classification –biological role and uses of lipids, Fat group. classification – Dietary sources	
	Fatty acids in foods nomenclature – Triglycerides – composition and functions. Physical properties of triglycerides – Polymorphism of triglycerides. Properties of fats – Rancidity and reversion of fats.	
3.	**Unit III: Proteins and Enzymes**	**10**
	Classification and functions – Role of proteins and requirements. Amino acids : Definition, classification, properties. Functions of proteins in foods – physical and chemical properties of proteins.	
	Important protein sources– Milk, Meat, Fish, Egg and Cereal proteins	
4.	**Unit IV: Vitamins and Minerals**	**10**
	Definition –Classification, general sources, properties, functions and dietary requirements Deficiency symptoms of vitamins A,D,E,K,C thiamins, riboflavin, niacin and biotin , role of minerals	
5	FIBRE- definition, types, sources, functions, importance in disease prevention.	3

REFERENCES

1. B. Sivasankar, "Food processing and preservation", Prentice – Hall of India Pvt. Ltd. 2002.
2. Potter, N. N. and Joseph, H. Hotchkiss, "Food Science", CBS Publishers and distributors, New Delhi,1996.
3. Fox, B. A. and Cameron, A.G., "Food Science, Nutrition and Health", 5th ed., Edward Arnold, London

1. Charley, H., Food Science, John Wiley and Sons Inc., New York, 1982.
2. Birch, G.G., Brennan, J. G. and Parker, K. J., The Sensory Properties of Foods, Applied Science Pub., London, 1977.
3. Robinson, D. S., Food – Biochemistry and Nutritional Value, Longman Scientific and Technical, London, 1987.

Sem II Paper 2
BvFt 202: Food processing operation (3 credits)

Sr. No.	Food processing operation (3 credits)	Lectures (45L)
1	**Cold preservation :** Freezing: requirements of refrigerated storage - controlled low temperature, air circulation and humidity, changes in food during refrigerated storage, progressive freezing, changes during freezing – concentration effect and ice crystal damage, freezer burn. Refrigeration load, factors determining freezing rate-food composition and non compositional influences	4
2	**Freezing- Mechanism and freezers:** Freezing methods -direct and indirect, still air sharp freezer, blast freezer, fluidized freezer, plate freezer, spiral freezer and cryogenic freezing**.**	6
3	**Dehydration :** Normal drying curve , effect of food properties on dehydration , change in food during drying ,drying methods and equipments air convection dryer, tray dryer, tunnel dryer continuous belt dryer , fluidized bed dryer, dryer, drum dryer, vacuum dryer ,freeze drying ,foam mat drying**.**	9
4	**Food Irradiation and Microwave Heating:** Ionizing radiation and sources, unit of radiations, direct and indirect radiation effects, safety and wholesomeness of irradiated food. Microwave heating and application**.**	6
5	**Packaging of foods:** Packaging: Properties of packaging material, factors determining the packaging requirements of various foods and brief description of packaging of frozen products, dried products, fats and oils and thermally processed foods	8
6	**Material handling:** Elementary concept of material handling in food industry, equipment and functioning of belt conveyor, screw conveyor, bucket elevator and pneumaticconveyor	2
7	**Thermal processing :** Introduction, classification of Thermal Processes, Principles of thermal processing, Thermal resistance of microorganisms, Thermal Death Time, Lethality concept, characterization of heat penetration data, Thermal process Calculations	5
8	**Separation processes** : Principles and methods of: distillation, extraction, washing, filtration, sedimentation, sieving and centrifugation	5

Reference

1. Desrosier NW and Desrosier JN, The Technology of Food Preservation, CBS Publication, New Delhi, 1998
2. Paine FA and Paine HY, Handbook of Food Packaging, Thomson Press India PvtLtd, New Delhi- 1992
3. Potter NH, Food Science, CBS Publication, New Delhi, 1998
4. Ramaswamy H and Marcott M, Food Processing Principles and ApplicationsCRC Press, 2006
5. Rao PG, Fundamentals of Food Engineering, PHI Learning Pvt Ltd, New Delhi,2010
6. Toledo Romeo T, Fundamentals of Food Process Engineering, AspenPublishers, 1999

Sem II Paper 3
BvFt 203: Food Safety and Hygiene (3Credit)

Sr. No	Content	Lectures (45L)
1	**Introduction to Food Safety** • Definition • Types of hazards, biological, chemical, physical hazards • Factors affecting Food Safety • Importance of Safe Foods	**5**
2	**Food Hazards of Physical and Chemical Origin** • Introduction • Physical Hazards with common examples • Chemical Hazards (naturally occurring ,environmental and intentionally added) • Impact on health • Control measures	**8**
3	**. Food Hazards of Biological Origin** • Introduction • Indicator Organisms • Food borne pathogens: bacteria • Food borne pathogens: viruses • Food borne pathogens: eukaryotes • Seafood and Shell fish poisoning • Mycotoxins	**12**
4	**. Management of hazards** • Need • Control of parameters • Temperature control • Food storage • Product design	**8**
5	**Hygiene and Sanitation in Food Service Establishments** • Introduction • Sources of contamination • Control methods using physical and chemical agents • Waste Disposal • Pest and Rodent Control • Personnel Hygiene • Food Safety Measures	**12**

References:

1. Handbook of food toxicology by S. S. Deshpande
2. The food safety information handbook by Cynthia A. Robert, 2009
3. Nutritional and safety aspects of food processing by Tannenbaum SR
4. Microbiological safety of food by Hobbs BC, 1973
5. Food Safety Handbook by Ronald H. Schmidt, Gary E. Rodrick
6. 1. Lawley, R., Curtis L. and Davis,J. The Food Safety Hazard Guidebook , RSC publishing, 2004
7. De Vries. Food Safety and Toxicity, CRC, New York, 1997
8. Marriott, Norman G. Principles of Food Sanitation, AVI, New York, 1985
9. Forsythe, S J. Microbiology of Safe Food, Blackwell Science, Oxford, 2000 &Sons; USA, 1987

Sem II Paper 4
BvFt 204: Food Microbiology (2 Credit)

Sr. No.	Content	Lectures (30L)
1	**Microbial Growth in Food** Microbial Growth Characteristics- Bacterial growth curve, microbial reproduction and microbial growth in food Factors affecting the growth of micro organisms in food.	4
2	**Food Fermentations** Fermentation –definition and types Microorganisms used in food fermentations Dairy Fermentations-starter cultures ,types and methods of preservation and propagation, Lactic acid and aroma compounds production, Health benefits of LAB, probiotics, prebiotics and symbiotics Fermentated Foods-types, methods of manufacture for vinegar, sauerkraut, tempeh, miso, soya sauce ,beer, wine and traditional Indian foods	12
3	**Food borne Diseases** Types – food borne infections, food borne intoxications and toxic infections Origin, symptoms and prevention of some commonly occurring food borne Diseases Emerging pathogens of concern	10
4	**Trends in Food Microbiology** Rapid Methods of Detection SCP , SCO, probiotic food Recent Advances	4

Recommended Readings

1) Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004
2) Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
3) Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997
4) Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993

Sem II Paper 5
BvFt 205 : Communication skill and Technical English (3 Credits)

Sr. No.	Communication skill and Technical English (3Credits)	Lectures (45L)
1	Communication Skills: - Structural and functional grammar; - meaning andprocess of communication, - verbal and non-verbal communication; - listeningand note taking, - writing skills, - oral presentation skills; - field diary and lab record; - indexing, - footnote and bibliographic procedures. - Reading andcomprehension of general and technical articles, precise writing, summarizing,abstracting; individual and group presentations, impromptu presentation,public speaking; Group discussion. Organizing seminars and conferences.	6
2	Reading and Study skills - Skimming/Scanning - Note making - Comprehension Skills - Notice, agenda , - Reading a passage with intonation and voice modulation	4
3	Report writing - Basics of good reporting - Different kinds of reports/ Structure of report - Reporting an event - Writing minutes of a meeting - Preparing a project report	4
4	Four basic letter patterns: Personal and professional correspondence. - Application letters - Regret letters - Appeal/Request letters - Complaint letters	4
5	Conventions of conversation - Etiquette - Asking questions/making suggestions etc - Writing a dialogue and role play	3
6	- Resume Writing - Covering letter for a job application - Resume writing with ready made formats available on computer packages.	3
7	Devising a questionnaire and interpreting facts - How to prepare a simple questionnaire - How to interpret data from surveys, tables, graphs etc,and to present	3

	the interpretation in coherent and lucid language - Transfer of information from visual into verbal	
8	Conventions of Social Interaction - Dialogue writing for formal/semi-formal situations Etc - How to Prepare for an interview - mock interview sessions	3

References :

1.M. Frank. Writing as thinking: *A guided process approach, Englewood Cliffs,* Prentice Hall Reagents.

2. L. Hamp-Lyons and B. Heasely: Study Writing; *A course in written English.* For academic and professional purposes, Cambridge Univ. Press.

3. R. Quirk, S. Greenbaum, G. Leech and J. Svartik: *A comprehensive grammar of the English language*, Longman, London.

4. Daniel G. Riordan & Steven A. Panley: *"Technical Report Writing Today"* - Biztaantra.

5. Daniel G. Riordan, Steven E. Pauley, Biztantra: *Technical Report Writing Today*, 8th Ed (2004).

6. Contemporary Business Communication, Scot Ober, Biztantra, 5th Edition (2004)

Sem II Practical 1
BvFt 206: Practical on Techniques in Biochemistry (3 Credit)

Sr. No	Title	Practical (15P)
1.	Preparation of solutions - normal, molar and per cent solutions and preparation of buffers**.**	3
2.	Qualitative tests for carbohydrates	2
3.	Estimation total free amino acids (Ninhydrin method)	2
4.	Biuret test for proteins	1
5.	Estimation of protein (Lowry's method)	1
6.	Detection of adulteration in fats and oils	1
7.	Thin layer chromatography of amino acids.	1
8.	Estimation of reducing sugar (Dinitrosalicylic acid method)	1
9.	Detection of adulteration in fats and oils	2
10.	Estimation of starch (Anthrone reagent method)	1

References:

(i) An Introduction to Practical Biochemistry – David T Plummer
(ii) Introductory Practical Biochemistry – Sawhney& Singh
(iii) Biochemical Methods- For Agricultural Sciences. S. Sadasivam and A. Manikam. (Wiley Eastern Limited)

Sem II Practical 2
BvFt 207: Practical on Food processing operation (3 credits)

Sr. No.	Food processing operation (3 credits)	Lectures (45L)
1	Preservation of food by the process of freezing	1
2	Preservation of food by the process of freezing	1
3	Comparison of conventional and microwave processing of food	2
4	Preservation of food by canning(Fruit/Vegetable/meat)	1
5	Cut-out analysis of canned food	2
6	Practical on Packaging of foods:	1
7	Drying of food using Tray dryer/other dryers	1
8	Osmotic dehydration	2
9	Minimal Processing	1
10	Testing of Packaging material	1
11	Practical on Thermal processing : Thermal process Calculations	1
12	Practical on Separation processes : Principles and methods of: distillation, extraction, washing, filtration, sedimentation, sieving and centrifugation	1

Sem II Practical 3
BvFt 208: Practical on food safety and hygiene (3 Credit)

Sr. No.	Food safety and hygiene (3 Credit)	Practical (15)
1	Preparation of different types of media (complex, differential and selective)	2
2	Enumeration of aerial microflora using PDA	1
3	Microbiological Examination of different food samples	2
4	Bacteriological Analysis of Water	1
5	Assessment of surface sanitation by swab/rinse method	1
6	Assessment of personal hygiene	2
7	Biochemical tests for identification of bacteria	2
8	Scheme for the detection of food borne pathogens	2
9	Implementation of FSMS – HACCP, ISO : 22000	2

Sem II Practical 4
BvFt 209: Practical of Food Microbiology (2 Credits)

Sr. No.	Food Microbiology (2 Credits)	Practical (10P)
1	Introduction to the Basic Microbiology Laboratory Practises and Equipments	1
2	Fuctioning and use of compound microscope	
3	Cleaning and sterilization of glassware	1
4	Preparation and sterilization of nutrient broth	1
5	Preparation of slant, stab and plates using nutrient agar	1
6	Cultivation and sub-culturing of microbes	1
7	Morphological study of bacteria and fungi using permanent slides	1
8	Simple staining, Gram's staining, Negative staining, Endospore staining, Standard Plate Count Method	1
9	Microbial examination of curd, Microbial examination of processed fruit and vegetable products, Microbial examination of canned foods, Microbial examination of egg	1
10	Assay of quality of milk by methylene blue reduction test.	1
11	Control of microbial growth by physical methods-heat	1