Ordinary Meeting of BOS of CES, held on 18-01-2016

MINUTES

An ordinary meeting of the Board of Studies (BOS) of Civil Engineering, Section, University Polytechnic, was held on 18-01-2016 at 02.30 P.M. in the conference room of University Polytechnic AMU.

The following Faculty members were present.

1. Prof. S.Iqbal Ali, (in the chair)
2. Mr. Mohd. Rizwan R. Khan (Incharge, Civil Engg. Sec.)
3. Mr. Azhar Jameel
4. Mr. Mohd. Kafi
5. Mr. Mohd. Israil
6. Mr. Mazhar Ali
7. Mr. Suhail A. Khan
8. Dr. Syed Kaleem A. Zaidi
9. Dr. Arshad Husain
10. Dr. Ahmad Ashfaq
11. Mr. Mohd. Idrees
12. Mr. Jan Nisar Akhtar.

RECOMMENDATIONS OF THE BOS MEETING

1. The minutes of meeting of the BOS, held on 19.05.2015, were confirmed by the members.
2. The revised syllabi for Advance Diploma in Food Technology and Advance Diploma in Environmental Engineering were approved (Annexure I & II). It was also decided that admission intake in ADFT will be 25 and in ADEE will be 20.
3. The students of I Semester of ADEE who have not appeared in End Semester Exam, due to long absence, their names should be removed from rolls of the University.
4. Passed with dissent note of Mr. M.R.R. Khan and Mr. Azhar Jameel, regarding it.

The BOS considered and recommended merging of the Civil Engineering Section with Department of Civil Engineering; Z.H.C.E&T. This may be done similar to women's college whose BOS of the respective department allocates teaching load in women's college as well as in the Department.

5. The Examiners, Moderators & Scrutinizers for II, IV & VI semester examinations 2015-2016 have already been approved in previous B.O.S., held on 19.05.2015. The Principal is authorized to make minor changes, in consultation with the Incharge, Civil Engineering Section.

Approved the examiners and moderators for annual system old courses & continuation cases of annual system, studying along with semester system students, for the session 2015-16.

(Annexure III) Confidential

Note: Moderators of the courses are recommended as examiners for Re-evaluation.

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Incharge
Civil Engg. Section
University Polytechnic
A.M.U., Aligarh
Revised Syllabus of Advance Diploma in Food Technology (ADFT)

Food Microbiology
Course No: ADFT-5101
Sessional Marks: 25
Pds/Week-03
Total Marks: 100

I- Semester

Unit-I: Introduction to microbiology: Cell theory, difference between prokaryotic and eukaryotic cells, Haeckel’s Kingdom protista, Whittaker five kingdom classification, Germ theory and Koch’s postulates, Structures and types of microbial cells (bacteria, yeast and mold). Working principle of light microscopes (Dark-field, Bright-field, Fluorescence and Phase contrast microscopes) and electron microscopes, Simple and differential staining techniques.

Unit-II: Microbial Growth: Growth curve and its different phases, Factors affecting microbial growth, Generation time, Synchronous and Asynchronous growth, Culture maintenance and preservation.

Unit-III: Microbial Spoilage of foods: Contamination of foods, Microbial spoilage of milk & milk products, meat, fish, poultry & egg products, fruits & vegetable products, Cereal grains, bakery and confectionery products, fermented and canned foods.

Unit-IV: Food borne diseases: Food intoxications (Botulism, Staphylococcal Gastroenteritis) and infections (Salmonella, Shigella, Clostridium perfringens, Bacillus cereus and E.Coli infections), Mycotoxins (Aflatoxin, Patulin, Ochratoxin) and their causative agents

Unit-V: Control of micro-organisms: Concept of TDT, F, z and D-value, Microbial spores, Physical & chemical anti-microbial agents - Temperature, Osmotic pressure, Radiations, Surface tension, Filtration, Phenols, Alcohols, Halogens (iodine and chlorine), Heavy metals, Detergents, Quaternary Ammonium compounds, Aldehydes, Ethylene oxide.

Recommended Books:

Food Chemistry and Nutrition
Course No: ADFT-5102
Sessional Marks: 25
Pds/Week-03
Total Marks: 100

Unit-I: Introduction to food chemistry: Scope of food chemistry. Introduction to different food groups: their classification and importance. Importance of nutrition and determination of nutritional value.

Unit-II: Water and Carbohydrates: Water- Structure, types and properties of water, water activity and its importance. Carbohydrates- Definition, classification, sources, chemical make-up, biological functions, nutritional and industrial importance.

Unit-III: Proteins and Fats: Proteins- Sources, chemical make-up, biological functions, nutritional aspects, industrial importance, essential amino acids, biological values, PER (Protein Efficiency Ratio).
Efficiency Ratio). Fats: Sources, chemical make-up, biological functions, nutritional aspects, essential fatty acids, hydrogenation, rancidity and industrial importance.

**Unit-IV: Minerals and Vitamins:** Importance and sources of minerals & vitamins with special emphasis on calcium, iodine, zinc, iron, fluorine. Fat and water-soluble vitamins, effect of processing and storage on vitamins. Deficiency disorders and requirements of different vitamins and minerals.

**Unit-V: Food Pigments and Enzymes:** Pigments- Types & sources, changes during processing & storage. Enzymes- Nomenclature, classification, enzyme kinetics, enzyme inhibitions, application of enzymes in food processing.

**Recommended Books:**

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**REFRIGERATION AND COLD STORAGE**

Course No: ADFT-5103  
Sessional Marks: 25  
Total Marks: 100  

**Pds/Week-03**

**Unit-I Principles of Refrigeration:** Refrigeration cycles, Vapour compression and vapour absorption cycles, refrigerants, characteristics of different refrigeration’s, ozone-depletion potentials, green house potential refrigerants, use of non polluting refrigerants, net refrigerating effect, ton of refrigeration - Components of a Refrigeration system: Compressor, condenser, Evaporator, Expansion valves piping and different controls. Atmospheric air and its properties, Psychometrics.

**Unit-II Cold Storage Design and Construction:** Small and large commercial storages, Cold Room temperatures, Insulation, Properties of insulating materials, Air diffusion equipment, Doors and other openings, prefabricated systems, walkin- coolers and refrigerated container truck: Freezer Storages, Freezer room temperatures, insulation of freezer rooms: Pre-cooling and pre freezing. Cold storage practice, Stacking and handling of material in and around cold rooms, Optimum temperatures of storage for different food materials-meat and poultry products, marine products, fruits and vegetables, spices and food grains, determination of cooling load for a cold storage.

**Unit-III Operations and maintenance – Controlled atmosphere and modified atmosphere storages:** Operation and maintenance, cleanliness, defrosting practices, preventive maintenance, safety measures, Controlled atmosphere and modified atmosphere storages, Principles and basics of their construction.


**Unit-V Freezing of Foods:** Freezing equipment, Freezing rates, growth rate of ice crystals size and its effect of texture and quality of foods, Freezer types, blast freezers, contact plate freezers, conveyORIZED quick freezers, Individual quick freezing, Freezing practice as applied to marine foods, meat and poultry, fruits and vegetables.
Recommended Books:

Basic Chemical Engineering
Course No: BKE-501
Sessional Marks: 25
Pds/Week-03 Total Marks: 100

Unit-I: Introduction – Classification of Unit Operations, Examples and applications of key unit operations. Working principles of centrifugal and screw pumps. Description of conveyors and belts.


Unit-III: Law of Conservation of Mass - fundamentals of material balance, material balance in batch and continuous process without chemical reactions, Batch, semi continuous and stirrer tank reactor.

Unit-IV: Heat Exchangers - Concept of heat exchanger, types of heat exchanger by flow design: counter flow and parallel flow and their graphical representations, heat transfer coefficient and overall heat transfer coefficient.

Unit-V: Evaporation and Drying: Types and description of fundamental mass transfer operations - Evaporation and drying – single effect and multiple effect evaporators, Description of natural and forced draft tray dryer, fluidized bed dryer, rotary dryer, vacuum dryer and freeze dryer. Drying curve.

Recommended Books:
1. Introduction to food process Engineering by Peter G Smith.

Food Microbiology and Analysis Lab
Course No: ADFT-5191
Sessional Marks: 150
PDS/Week-06 Total Marks: 250

1. Culture media preparation for different types of microorganisms
2. Sterilization of media and glassware’s using autoclave apparatus
3. Counting of microbial colonies using digital colony counter
4. Identification of bacteria using gram staining technique.
5. Study of microbial growth curves.
6. Yeast and mould count for a given sample of food
7. Preparation of standard solutions
8. Determination of moisture in a given food sample
9. Determination of protein and ash content in a given food sample
10. Determination of sugars (reducing, non-reducing and total sugars) in a given food sample by Lane-Eynon method
11. Determination of crude fat in a given food sample
12. Determination of pH and titratable acidity of a given food sample
13. Determination of ascorbic acid in a given food sample

Unit Operations Lab
Course No: ADFT-5194
Sessional Marks: 150

Pds/Week-06
Total Marks: 250

1) To determine the physical property of food grain and angle of repose (bulk and true density)
2) Working principle of laboratory scale ball mill.
3) To perform sieve analysis.
4) To determine the settling and sedimentation of particles in a fluid.
5) Working principle of plate and frame filter press or laboratory filtration system.
6) To determine the coefficient of discharge of Orifice-meter or Venturimeter.
7) Determination of efficiency, NPSH and preparation of Characteristic curves of centrifugal and reciprocating pump
8) Study of parallel flow and counter flow heat exchanger.
9) Drying of solids in a tray dryer under natural condition or forced draft condition.
10) To calculate the heat transfer coefficient of double jacketed vessel during heating or cooling.
11) To study operation of a reverse osmosis system.
12) To study working of a fluidized bed dryer.

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Principal
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II Semester

ADFT-5201 - Food Preservation Technology
Course No: ADFT-5201
Sessional Marks: 25
PdS/Week-03
Total Marks: 100


Unit-II: Low temperature Preservation: Refrigerated and cold storages. Freezing and frozen storage, freezing curve, freezing techniques, effect of freezing on quality, thawing of frozen foods

Unit-III: Preservation by High Temperature: Principles of thermal processing, Blanching, Pasteurization, Sterilization, Canning: their Definition, Method, advantages and disadvantages. Moisture Removal: Methods and equipments for evaporation/concentration (Open kettle, Flash, Thin-film and Vacuum evaporators, Freeze concentration). Drying and dehydration methods (Tray, Tunnel, Belt trough, Spray and Drum driers).

Unit-IV Non-thermal Preservation Methods: Basic principles of Irradiation, High pressure technology, Biological methods (fermentation and pickling), Pulse electric field technology and Ultrasonic treatment for food preservation.

Unit-V: Food additives: Classification, functions and uses of different food additives - Preservatives, antioxidants, emulsifiers, stabilizers, anticaking agents, buffering agents, food colors and flavors, texture modifiers (thickeners), leavening agents, low calorie sweeteners, humectants.

Books recommended:

Technology of Fermented and Baked Foods
Course No: ADFT-5202
Sessional Marks: 25
PdS/Week-03
Total Marks: 100

Unit-I: Introduction: Definition, advantages of fermentation and nutritive value of fermented food products. Type of fermentation processes; requirements for fermentation and equipment.


Unit-III: Bread Manufacture: Raw Materials for Bakery Products: their roles. Equipments used to test the rheology of dough- Farinograph, Alveograph, Extensometer, Maturograph. Technology of bread manufacture, different methods for bread making, bread defects and their causes. Quality control in bread manufacture.

Unit-IV: Biscuits, Cakes and Pastry Manufacture: Different types of biscuits and cookies, preparation of biscuits using different methods, problems in biscuit manufacture. Different types
of cakes & pastries and their preparation using different methods, Balancing cake formula, Cake defects and their causes.


Books recommended:
1. Prescott & Dunn's Industrial Microbiology by Gerald Reed; CBS Publishers.

Process Technology of Dairy products
Course No: ADFT-5203
Sessional Marks: 25
Pds/Week: 03
Total Marks: 100

Unit I: Introduction: Status and scope of dairy industry in India, definition of milk, composition, factors affecting the composition of milk, types of milks, nutritive value and healthfulness of milk.

Unit II: Physico-chemical properties of milk: color, flavor, taste, specific gravity and density, boiling and freezing points, thermal conductivity, specific heat, acidity and pH, viscosity, refractive index, surface tension. Platform tests- smell, appearance, sediment, acidity, alcohol-alizarin test, Resazurin and MBR tests.

Unit III: Fluid milk processing: chilling, receiving, filtration, straining and clarification, pasteurization (LTLT, HTST, UHT, vacuum pasteurization methods), Sterilization (batch and continuous methods), Standardization, Homogenization, Packaging.

Unit IV: Cleaning and sanitation of dairy plants and equipments: Manufacturing process for cream, evaporated and condensed milk, milk powder, instant milk powder butter and ghee.

Unit V: Ice Cream: Manufacturing process for ice cream, factors affecting the quality of ice cream, coagulated milk products (paneer, cheese, classification of cheese, Khoya, Chenna)

Books recommended:
1. The technology of milk processing by C P Anatakrishnan, A Q Khan & P N Padmanabhan; Shri Lakshmi Publishers.
2. Outlines of dairy Technology by Sukumar Dey.

Technology of Plantation Crops and Spices
Course No: ADFT-5204
Sessional Marks: 25
Pds/Week: 03
Total Marks: 100

Unit-I: Tea Processing: History of tea, Cultivation of tea, Chemical composition and processing of tea, Processing of instant tea. FSSA standards for tea. Other tea products: Various types of tea(White, black, Yellow, green and Oolong tea), Ethnic tea products and herbs used as tea.

Unit-III: Cocoa processing: Fermentation of cocoa beans, processing of cocoa beans. Manufacture of cocoa products - chocolate, cocoa powder & cocoa butter, drinking cocoa, instant cocoa, drinking chocolate. Sugar bloom and fat bloom in chocolates. FSSA standards for cocoa products

Unit-IV: Processing of Spices: Definition, Processing of Spices, Extraction of essential oils and oleoresins from spices, Spice products. Processing and uses - Pepper, Small Cardamom, Black Cardamom, Ginger, Chilies, Turmeric, Asafoetida, Aniseeds, Cloves

Unit-V: Processing of Plantation crops: Processing of Cashewnuts, Cashew-apple juice, Cashew-apple juice, Almonds, Almond oil, Peanuts, Peanut oil, Peanut butter, Dates, Date products, Saffron, Figs, Apricots (dried, canned, frozen), Raisins, Plums; their uses.

Books recommended:

Fruits and Vegetable Processing Technology

Course No: ADFT-5205
Sessional Marks: 25

Unit-I: Introduction: Status & scope of fruit and vegetable industry in India, classification, composition and nutritive value of fruits and vegetables. Economic reasons of processing and preservation. Site selection for fruit and vegetable processing plant


Unit-III: Dehydration and Canning of fruits and vegetables: Dehydration of fruits and vegetables - tray, vacuum, tunnel driers. Osmotic dehydration - concept & applications. Rehydration ratio, Case hardening and Shrinkage. Canning of fruits and vegetables - process scheme, specific requirements for canning of fruits and vegetables, general considerations in establishing commercial fruit and vegetable cannery, causes of spoilage and defects in cans.

Unit-IV: Processed fruit products: Jam - (definition, standards, method of manufacture); Jelly - (definition, standards, extraction of pectin, gel-formation); Marmalades - (definition, standards, method of manufacture). Juice Processing (Extraction, Clarification, Preservation) Unfermented beverages - classification, standards and preparation of Natural juice, sweetened juice, RTS, Nectar, Cordial, Squash, Crush, Syrup. Fermented beverages - Wine and Beer manufacture.

Unit V: Processed vegetable products: Potato Processing - manufacture of potato chips, French fries and potato flour. Tomato processing - manufacture and standards of tomato juice, tomato puree, tomato paste, tomato ketchup, tomato soup.

Books recommended:
2. Fruit and vegetable preservation: Principles and practices by R P Srivastava & Sanjeev Kumar
Food preservation Technology and Product development Lab-I

Course No: ADFT-5291
Sessional Marks: 150

1. Study of bakery equipments
2. Determination of Gluten content of wheat flour
3. Determination of alcoholic acidity of wheat flour
4. Determination of dough-raising capacity of yeast
5. Preparation of bread
6. Preparation of salty Biscuits
7. Preparation of sweet Biscuits
8. Preparation of sponge Cake
9. Preparation of decorated Cake
10. Preparation of Buns
11. Preparation of Pizza base
12. Curd on boiling test for given sample of milk
13. Sedimentation test for given sample of milk
14. Preparation of flavored milk
15. Preparation of Cottage Cheese
16. Preparation of Khoa
17. Preparation of Chhana
18. Determination of TSS, Specific gravity and SNF of milk using lactometer
19. Study of mini pasteurization plant

Computer Lab

Course No: ADFT-5292
Sessional Marks: 100

Pds/Week-03
Total Marks: 150

Introduction to computer, Use of word processing software (MS Word) for creating reports. Solving problems related to food technology using MS Excel, Use of statistical package for analysis of data using Excel, Use of MS Power Point for preparing presentation slides. Use of Internet and E-mail.

Principles
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III Semester

Food Packaging, Handling and Transportation
Course No: ADFT-5301
Sessional Marks: 25
Pds/Week-03
Total Marks: 100

Unit-I: Introduction: Importance, definition and function of food packaging, Form-Fill-Seal packaging machines, types of packaging materials, Glass (construction of jars and bottles, optical, thermal and mechanical properties of glass), Metal (types of base metal sheets, construction of metal cans, lacquering), Plastics- substituted olefins, tetrafluoro ethylene, PET, polyamides, polyesters.

Unit-II: Environmental factors and food stability: Effect of oxygen and light, Light Protection characteristics of packages, permeability to gases and vapors, methods of measuring permeability, permeability to fixed gases, permeability to humidified gases, flow through pin holes, cracks and imperfect seals, permeability of multilayer materials.

Unit-III: Packaging tests: tensile strength, compression, bursting, tear and impact test for packages, integrity testing of packages, cushioning effect on packaged foods, deterioration of packaged foods, shelf life calculation for packaged foods

Unit-IV: Packaging systems: Modified Atmosphere and Controlled Atmosphere Packaging, Aseptic packaging including techniques, aseptic systems (Tetrapack, Bag-in-Box), integrity testing of aseptic packages

Unit-V: Selective packaging: Important considerations in packaging of fruits and vegetables, meat, fish and poultry, milk and dairy products, cereal and bakery products.

Books recommended:
1. Food Packaging: Principles and practices by Gordon L Robertson; CRC Press.
2. Physical principles of food preservation by Marcus Karel & Daryl B Lund; CRC Press.

Food Quality Standards and Regulations
Course No: ADFT-5302
Sessional Marks: 25
Pds/Week-03
Total Marks: 100

Unit-I: Introduction: Concept, objectives and need for quality, difference between quality control and quality assurance, method of quality control. Proximate composition and analysis of proximate constituents (Moisture, Fat, Protein, Sugars, Ascorbic acid, Riboflavin, Thiamine)

Unit-II: Sampling and testing: definition of sampling, purpose, sampling techniques, requirements and sampling procedure for liquid, powdered and granular materials, Measurement of physicochemical and mechanical properties- color (CIE system, working principles of Hunter colour difference meter, Disc colorimeter, Lovibond Tintometer, Spectrophotometer), Primary and secondary texture characteristics-consistency (Bostwick and Adams consistometer), viscoity (Efflux tube viscometer, Brookefield viscometer), texture (Texturemeter).

Unit-III: Sensory quality control: definition, objectives, panel selection, laboratory set-up, sensory evaluation methods (Duo-Trio test, Paired comparison test, Triangle test, Ranking test, Rating test, Hedonic rating test, Threshold test). Statistical quality control (control chart by variables, control chart by attribute), Basic concept of TQM, consumer preference and acceptance.

akshrivasava@rediffmail.com

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Unit-IV: Food laws: Objectives, requirements and benefits of food standards (FSSA, PFA, BIS, AGMARK, FPO, FDA, Codex Alimentarius Commission), FPO standards for fruits and vegetable products.

Unit-V: Hygiene Considerations: General hygiene and sanitation in food industry, GMP, HACCP, ISO and PAS99 series- their objectives and principles.

Books recommended:

Livestock and Marine Products

Course No: ADFT-5303
Sessional Marks: 25

Pds/Week-03
Total Marks: 100

Unit-I: Introduction: Status and scope of Indian meat, fish and poultry industry, their export potential. Composition of muscle, muscle proteins. Ante-mortem examination of animals, Slaughter of animals, Abattoir, different cuts of meat, Post-mortem changes (loss of homeostasis and rigor mortis), Proximate analysis of meat.


Unit-IV: Fish Processing: Types of fish, composition and nutritive value, factors affecting the quality of fish. Drying, Curing, Smoking, Freezing and Canning of fishes.

Unit-V: By-products utilization: Frozen Storage of fresh and processed meat, poultry and fish. By-products of meat, fish, poultry and egg industry and their uses.

Environmental Pollution and Management

Course No: ADFT-5304
Sessional Marks: 25

Pds/Week-03
Total Marks: 100

Unit-I: Introduction: Types of physical, chemical and biological impurities present in water, water demand in food industry, drinking water standards (IS-10500) and quality tolerances for water for processed food industry (IS-4251), effects of water quality parameters on food industry.

Unit-II: Water treatment: Types of hardness - temporary and permanent hardness and their removal, water softening using ion exchange column, methods of disinfection and selection criteria for disinfectants, surface water and ground water treatment system.

Unit-III: Waste water treatment: magnitude of wastewater generation in food industries, wastewater treatment units and their functions, preliminary treatment system, primary treatment
system, biological/secondary treatment system using Activated Sludge Process and Trickling Filter.

Unit-IV: Advanced/tertiary treatment: Membrane separation processes in water treatment – osmosis and reverse osmosis (RO), feed, permeate and concentrate, single and two stage RO system, single and two pass RO system, concept of domestic and industrial water purification systems.

Unit-V: Solid waste management: classification and characterization of municipal solid waste, treatment method – pelletization, composting and biogas generation; overview of solid waste generation and its utilization in food industries such as dairy, meat, sugar, fruits and vegetables.

Books recommended:

Entrepreneurship Development

Course No: ADFT-5305
Sessional Marks: 25

Unit-I: Entrepreneurship: Concept and Meaning, Need and Scope in food industry, Qualities of a successful entrepreneur.

Unit-II: Project formulation: Meaning and definition of project. Preparation of detailed project report (DPR) and Techno-Economic feasibility reports (TEFR).

Unit-III: Project management: Project scheduling by network techniques such as bar chart, CPM and PERT and their applications in food industry.

Unit-IV: Basis of Bidding: General, Technical Aspects, Commercial Aspects and Pricing, Estimates for Work - Budgetary estimate, material estimate and other estimates such as Manpower requirements, consumables, spares and fuel.


Food preservation Technology and Product development Lab-II

Course No: ADFT-5391
Sessional Marks: 150

1. Preparation of Jam
2. Preparation of Jelly
3. Preparation of Pickle
4. Preparation of Puree
5. Preparation of Paste
6. Preparation of Sauce
7. Preparation of Ketchup
8. Preparation of RTS beverage
9. Preparation of dehydrated food products
10. Study of laboratory canning unit

IV Semester

Seminar
Course No: ADFT-5491
Sessional Marks: 200
Total Marks: 325

The seminar, on any topic pertaining to food technology, would involve:
   a) Exhaustive literature review, comprising of at least 100 references, based on various
      reputed journals (peer reviewed), conference proceedings, latest books, etc.
   b) Preparation, submission and presentation of a review paper (1 Hard copy of paper and a
      soft copy of paper and presentation)
   c) Secondary data analysis and its interpretation to bring out the finding and
   d) Preparation, submission and presentation of the seminar report (3 Hard copies of seminar
      report and a soft copy of seminar report and presentation)

Project
Course No: ADFT-5492
Sessional Marks: 200
Total Marks: 325

Each student shall undertake project work assigned to him/her related to the area of food
technology, either in a Food Industry or in the department, under the supervision of a faculty
member. Industrial project/training will include study of food processing and preservation
industries- raw materials used, unit operations and processes involved in processing of different
kinds of food products and their environmental issues. The work will be allotted specifying the
different aspects to be carried out by the student. Weekly progress report has to be submitted by
each student (in the prescribed format) to the supervisor/course teacher whether undergoing
industrial training or departmental project work. At the end of the semester the student will
submit a final report on his work. Preparation, submission and presentation of the project report
(3 Hard copies of project report and a soft copy of project report and presentation)
Bakery and Dairy Technology Lab
Course No: ADFT-5291
Sessional Marks: 150

1. Study of bakery equipments
2. Determination of gluten content of wheat flour
3. Determination of alcoholic acidity of wheat flour
4. Determination of dough-raising capacity of yeast
5. Preparation of bread
6. Preparation of salty Biscuits
7. Preparation of sweet Biscuits
8. Preparation of sponge Cake
9. Preparation of decorated Cake
10. Preparation of Pizza base
11. Preparation of Cottage Cheese
12. Preparation of Khoa
13. Preparation of Chhana
14. Determination of TSS, Specific gravity and SNF of milk using lactometer
15. Study of mini pasteurization plant

Product development and water quality Lab
Course No: ADFT-5391
Sessional Marks: 150

1. Preparation of Jam
2. Preparation of Jelly
3. Preparation of Pickle
4. Preparation of Puree
5. Preparation of Paste
6. Preparation of Ketchup
7. Preparation of RTS beverage
8. Preparation of a dehydrated food product
9. Study of laboratory canning unit
10. Determination of hardness in a given sample of water
11. Determination of BOD in a given sample of water
12. Determination of COD in a given sample of water
13. Determination of total solids (TS), total suspended solids (TSS) and total dissolved solids (TDS) in a given sample of water

Annexure III
B.O.S. 02.05.17
Environmental Pollution and Management

Course No: ADFT-5304
Sessional Marks: 25
Total Marks: 100

Unit-I: Introduction: Types of Pollutants, Air Pollution, Water Pollution, Land Pollution. Types of physical, chemical and biological impurities present in water, water demand in food industry, drinking water standards (IS-10500) and quality tolerances for water for processed food industry(IS-4251), effects of water quality parameters on food industry.

Unit-II: Water Treatment: Flowsheets, Aeration, Sedimentation, Coagulation & Flocculation. Types of hardness: Temporary and permanent hardness and their removal, water softening using ion exchange column, methods of disinfection and selection criteria for disinfectants.

Unit-III: Wastewater Treatment: Magnitude of wastewater generation in food industries, wastewater treatment units and their functions, preliminary treatment system, primary treatment, biological/secondary treatment system using Activated Sludge Process and Trickling Filter.


Unit-IV: Solid waste management: Classification, sources, and characterization, Generation, Collection & Transfer of municipal solid waste. Treatment methods: Pelletization, Incineration, Composting and biogas generation.

Reference Books: