

**Swami ramanand Teerth Marathwada University,
Nanded**

**Syllabus
For
B.Sc. food Technology
Semester – VI**

June 2013

309 - SPECILITY FOODS

Theory

| Number of Units | Topics |
|-----------------|--|
| 1 | Need and scope of specialty foods |
| 2 | Specialty food based on ease in preparation for cost health benefits <ol style="list-style-type: none"> i Functional foods ii Convenience food iii Health care and medical benefits iv Nutritional status v Low cost foods |
| 3 | Specialty foods based on sources <ul style="list-style-type: none"> • Cereals and millets • Legumes and pulses • Fruits and vegetables • Animal food sources • By product based • Non conventional sources |
| 4 | Specialty foods based on process <ul style="list-style-type: none"> • Cereals and millets • Innovate process technology • Food additives basis • Bioactive components • Novel nutraceuticals products • Packaging techniques • Adaptable technology basis • Fast and PET foods 3 |
| 5 | Specialty food based on genetics <ol style="list-style-type: none"> 1 Genetically modified foods 2 Transgenic foods 3 Biotechnological aspects of detoxification |
| 6 | Therapeutic foods <ol style="list-style-type: none"> 1 Modification of diets in disorders, feeding purposes 2 Disease oriented of different organs ex: digestive trac, liver cardiovascular |

| | |
|---|---|
| | system, kidney, metabolic disorders, allergy, endocrine disorders 3 Supplementary foods |
| 7 | Specific consumers oriented foods <ul style="list-style-type: none"> • Fast foods • Defense persons • Space/astronaut • High altitude mountain climbers • Sports foods |
| 8 | Specialty foods based on growing/cultivation methods-organic, inorganic farming |

REFERENCE BOOKS

| | | |
|---|-------------------------------|---------------|
| 1 | Food Science | Potter |
| 2 | Processed Protein Food Stuffs | Alchule |
| 3 | Food and Nutrition | M Swaminathan |
| 4 | Therapeutic Diets | NIN |
| 5 | Supplementary Foods | NIN |

310 - EXTRUSION TECHNOLOGY

Theory

| Number of Units | Topics |
|-----------------|--|
| 1 | Extrusion Technology – Importance, principles of extrusion cooking, method of extrusion cooking |
| 2 | Extruders – Types of extruders, single screw, twin screw, their applications, effects of dependent and independent variables on the product quality. |
| 3 | Extruded products –Raw materials, process of manufacture, properties, quality, evaluation, packaging requirement, marketing |
| 4 | Amino acid fortification of foods i.e. breaks fast cereals, infant foods bread, baked products. |
| 5 | Foods proteins Types, source, availability need properties food problems role, means for increasing food supply |
| 6 | New protein foods, tofu, miso texturized vegetable protein, hydrolyzed vegetable protein formulation and quality control |
| 7 | Meat Analogue, commercial development, nutritional aspect, marketing aspect. |

Practicals

| Number of Units | Topics |
|-----------------|--|
| 1 | Physiochemical properties of protein rich products, weaning foods, beverages |

| | |
|----|---|
| 2 | Study of Texturized products, protein rich bakery products |
| 3 | Study of Type of food extruders, preparation of extruded products |
| 4 | Study of Factors affecting extrusion cooking, moisture content, diameter, temperature, pressure, screw speed, time quality evaluation of these products |
| 5 | Study of Preparation of quality policy documentation (Quality Manuals) |
| 6 | Study of Preparation of laboratory manuals |
| 7 | Study of Application of HACCP to products |
| 8 | Study of Preparation of documentation and records |
| 9 | Study of Auditing-surveillance, mock audit |
| 10 | Visit to units implementing GMP,GAP,ISO systems/standards, HACCP Certification |

REFERENCE BOOKS

1. New protein foods vol,I,II A.L. Altschul
2. Extruded foods Matz

311 - FOOD PLANT DESIGN AND LAYOUT

Theory

| Number of Units | Topics |
|-----------------|---|
| 1 | Overall design of an enterprise : Plant design, sales planning for plant design |
| 2 | Strength of material - engineering materials, material science, use of various metals, including plastic, glass, etc in food industry, selection & specification- material design, concepts & manufacturing of various equipments & machineries for food processing plant |
| 3 | Plant Location, levels of plant location. Location of layout : location factors, plant site selection. Location theory & models, industrial buildings and grounds |
| 4 | Classification of Dairy and Food Plants, farm level collection and chilling centre, space requirement |
| 5 | Preparation of plant Layout: Plant Layout problem, importance, objectives, classical types of layouts, advantages of good layout |
| 6 | Siting of Process sections, equipment selection and capacity determination |
| 7 | Arrangement of process, and service equipment. Estimation of Services and Utilities |
| 8 | Office layout, Line balancing, Flexibility. Practical Layouts |
| 9 | Maintenance of Food Plant Building, Illumination and Ventilation, Cleaning and sanitization, painting and colour coding, fly and insect control |

Practicals

| Number of Units | Topics |
|------------------------|---|
| 1 | Layout of food storage wares and godowns |
| 2 | Layout and design of cold storage |
| 3 | Layout of preprocessing house/Prepackaging unit |
| 4 | Layout of Milk and Milk Product plants |
| 5 | Bakery and related Product plant, Layout of multi-product and composite food plants |
| 6 | Fruits processing plants, Vegetable processing plants |
| 7 | Waste treatment and management of food plant |

REFERENCE BOOKS

1. Milk Plant Layout H.S. Hall (1963). FAO Pub., Rome
2. Plant Layout & Design James M. Moore (1962),
Mac Millan, New York
3. Engineering for Dairy & Food Products A. W. Faral (1980). Rebert E., Kriger
Pub Co. New York.

312 - FOOD LAWS & REGULATIONS

Theory

| Number of Units | Topic |
|-----------------|--|
| 1 | Introduction to subject. Need of enforcing the laws and various types of laws. |
| 2 | <p><u>Mandatory food laws</u></p> <p>Food safety and standard act 2006 Food safety and standards authority of India, food advisory committees, scientific panels and scientific committees, state food safety authority, standards for food articles, food recall procedure, tribunal, offences and penalties, general principles to be followed in administration of act, general provision as to articles of food, special responsibility as to safety of food</p> |
| 3 | <p><u>Prevention of Food Adulteration Act (1954)</u></p> <p>Definition, object of act, central committee for food standard ; public analysis food inspector, duties of food inspector, Report of public analyst, sealing, fastening and dispatch of samples and power of court</p> |
| 4 | <p><u>Other Mandatory acts</u></p> <p>The standards of Weights and Measure Act(1976), The Packaged Commodities Rules (1977), Essential Commodities Act(1986), Consumer protection Act (1986), The Environment Protection Act(1986), and the Environment Protection Rules (1986), Insecticide Act (1968) The Export (Quality Control and Inspector)</p> |
| 5 | <p><u>Food Product Order</u></p> <p>The Fruit Products Order (1955), The Milk and Milk Product Order (1992), The Meat Food Products Order(1973), The Vegetable Oil Products(control) Order (1947), The Edible Oils Packaging (Regulation) Order (1998), The Solvent Extracted Oil, De Oiled Meal, and Edible Flour (Control) Order (19678), The Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and distribution) Act (1992)</p> |

| | |
|---|--|
| 6 | <p><u>Optional food standards</u></p> <ul style="list-style-type: none"> - Scope of these standards, their need, procedure to obtain that standard. The bureau of Indian Standards Act (1986), The Agricultural Produce (Grading and Marketing) Act (1937) – AGMARK |
| 7 | <p><u>Codex Standards</u></p> <ul style="list-style-type: none"> - Scope of codex standards, codex standards for cereals, pulses, fruit & vegetables, Meat & Poultry products, Recommended international code of hygiene for various products |

Practicals

| Number of Units | Topics |
|-----------------|---|
| 1 | Examination of honey for PFA and BIS standards. |
| 2 | Examination of spices for Agmark and BIS standards. |
| 3 | Examination of milk and milk products for BIS and milk product order-standards (MMPO) |
| 4 | Examination of fruit Jam/squash/ketchup of two to three different companies for FPO specifications. |
| 5 | Visit to BIS/Agmark/quality control laboratory |

REFERENCE BOOKS

1. Hand Book on Food Safety and Standards Act, 2006. P. K. Das.
2. The Prevention of Food Adulteration Act. Universal Law Publishers, New Delhi. Professional Book. Publishers, New Delhi
3. Quality Control in Food Industry Vol . 1 S. M. Herschderfer

313 - ENTREPRENEURSHIP DEVELOPMENTS AND COMMUNICATION SKILL

Theory

| Number of Units | Topics |
|-----------------|---|
| 1 | Revision of factors of production, supplementing science and technology as a modern factor |
| 2 | Entrepreneur and Enterprise – Concept, definitions and characteristics |
| 3 | Entrepreneurial Development – Objectives, Evolution and Indian experience |
| 4 | Functions and classification of entrepreneurs. Entrepreneur environment – Political, economic, social, legal, technological and cultural |
| 5 | Growth of entrepreneurship - Factors influencing entrepreneurial growth |
| 6 | Women as entrepreneurship in India, Selection of enterprise by Women |
| 7 | Problems of Women entrepreneurs. Associations of Women entrepreneurship – AWAKE , IMA and SEWA |
| 8 | Industrial consultancy – concept, components and importance |
| 9 | Institutions for entrepreneurial development – commercial banks and District Industries Centre |
| 10 | Investment analysis – undiscounted & discounted techniques Risk analysis in Investment decisions |

Practicals

| Number of Units | Topics |
|-----------------|---|
| 1 | Identification of entrepreneurship quality based on various methods |

| | |
|---|---|
| 2 | Selection of enterprise best suited on gender basis |
| 3 | Selection & identification of enterprise based on local / regional resources |
| 4 | Studies on important communication skills for development of enterprise by entrepreneur |
| 5 | Studies on market survey based on enterprise |
| 6 | Preparation of project report |
| 7 | Studies on investment analysis |
| 8 | Deterministic approach of entrepreneur for various finance institute |

REFERENCE BOOKS

1. Hand Book for New Entrepreneurs Bhatt, EDI faculty, Institute
Entrepreneurship Development
of India, Ahmedabad.
2. Entrepreneurship & Venture Chifford M & Back M B Mc Graw Hill
Book Management Co, New York
3. Entrepreneurship G. Babu Rao, TITI (SR) Hyderabad
4. Organizational Behavior Fred Luthomi (1989) Tata M C
publishers, New Delhi. Graw Hill
5. Fundamental of Business Y. K. Bhushan (1987) Organization &
Management Sultan Chand & Co.
New Delhi.

314 - PRODUCT DEVELOPMENT AND FORMULATION

Theory

| Number of Units | Topics |
|-----------------|--|
| 1 | Importance and objectives of formulation for new product development |
| 2 | Formulation based on sources availability and cost competitiveness for concept developments of new products |
| 3 | Standardization of various formulation and product design |
| 4 | Adaptable technology and sustainable technology for standardized formulation for process development |
| 5 | Process control parameters and scale-up production trials for new product development at lab and pilot scale |
| 6 | Quality assessment of new developed products |
| 7 | Market testing and marketing plan |
| 8 | Costing and economic evaluation of developed products |
| 9 | Steps for commercialization/product launch for marketing. |

Practicals

| Number of Units | Topics |
|-----------------|--|
| 1 | Market survey of existing various products |
| 2 | Study of Formulation of new products based on corporate decision/need based 1 Protein-energy rich 2 Low calorie (fat replacer) 3 Low sodium content 4 Glycemic index based 5 Cholestrolemic index based 6 Phyto-chemical based |
| 3 | Study of Product development based on above formulation depending on local sources/technology Study of Quality assessment |
| 4 | New product development for |
| 5 | i) Infant / Weaning foods ii) Geriatric iii) Physiological status iv) Athletes |

REFERENCE BOOKS

- 1 New food Product Design and Development Beckly,Blackwell Publishing
Oxford UK
- 2 Sensory and Consumer Research in food Moskowitz, Blackwell
Product Design and Development. Publishing Oxford UK

315 - QUALITY ASSURANCE AND CERTIFICATION

Theory

| Number of Units | Topics |
|-----------------|--|
| 1 | Quality inspection, quality control, quality management and quality assurance |
| 2 | Total quality management <ul style="list-style-type: none">• Cereals and millets• Good manufacturing practices• Good agricultural practices• Good laboratory practices• Quality management systems (QMS) |
| 3 | Quality Circles, SQC, ISO System |
| 4 | HACCP, principles, implementation procedures |
| 5 | Plan documentation, types of records |
| 6 | Auditing, surveillance Audit, mock audit, third party quality certifying audit Auditors and Lead auditors. |
| 7 | Certification, certification procedures, certifying bodies, accrediting bodies, international bodies. |

REFERENCE BOOKS

1. Preharvest and Post Harvest Food Safety
Beier, Blackwell Publishing
Oxford UK
- 2 Guides to Food Laws and Regulations
Curties, Blackwell Publishing
Oxford UK
- 3 Technologies of Food Preservation HACCP
Desrosier and Desrosier
Mortimore, Blackwell
Publishing Oxford UK.

316 - ENVIRONMENTAL SCIENCE

Theory

| Number of Units | Topics |
|-----------------|---|
| 1 | Environmental science : An introduction |
| 2 | Ecosystem: kinds, structure, characteristics, functioning |
| 3 | Biochemical cycles |
| 4 | Air pollution: Hazards & remedies |
| 5 | Water pollution: Hazards & remedies |
| 6 | Solid waste pollution: Hazards & remedies |
| 7 | Noise pollution: Hazards & remedies |
| 8 | Soil pollution: Hazards & remedies |
| 9 | Radioactive pollution: Hazards & remedies |
| 10 | Management of urban waste water |
| 11 | Recycling of organic waste |
| 12 | Recycling of factory effluent |
| 13 | Control of environmental pollution through law |
| 14 | Composting of biological waste |

Practicals

| Number of Units | Topics |
|-----------------|---|
| 1 | Water quality parameters |
| 2 | Collection of sample for pollution study |
| 3 | Estimation of BOD & COD |
| 4 | Estimation of nitrates and phosphates |
| 5 | Estimation of pollutant elements & heavy / toxic elements |

REFERENCE BOOKS

1. Environmental Biology Dr. K. C. Agrawal.
2. Fundamentals of Environmental Science G. S. Dhaliwal & G. S. Sanghai