

AC 27/2/13
Item no. 4.27

UNIVERSITY OF MUMBAI



Syllabus

SEMESTER III and IV

Program: M.Sc.

Course: Home Science

Branch IB: Food Processing and Preservation

(Credit Based Semester and Grading System with effect
from the academic year 2013–2014)

SEMESTER III

Course Code	Subject	Internal Marks	Semester End Examination	Total marks	Periods / week	Credits
PSHSIB301	Food Safety& Quality Control	40	60	100	4	4
PSHSIB302	Advances in Human Nutrition	40	60	100	4	4
PSHSIB303	Management & Business Administration	40	60	100	4	4
PSHSIBP301	Food Quality Control	—	100	100	4	4
PSHSIBP302	Project: Preliminary research	—	100	100	4	4
PSHSIBP303	Project execution	—	100	100	4	4
	TOTAL			600	24	24

Course Code	Title	Periods/week	Marks	Credits
PSHSIB301	Food Safety and Quality Control	4	100	4

Objectives

- To acquire knowledge about quality and safety aspects of food.
- To learn about the various ways of evaluating and controlling food quality.

Course Content		Periods
UNIT I	Food Quality Meaning and definition of food quality Quality factors in foods, indicators of food quality. Meaning, importance and ways of Food Quality Assessment. Sensory evaluation Physiological bases, sensory characteristics of foods, types, selection and training of sensory panel, requirements for sensory evaluation tests, types of tests, analysis and interpretation of sensory evaluation tests	15
UNIT II	Objective evaluation Basic guidelines, physical methods to evaluate volume, specific gravity, moisture, texture rheological characteristics, chemical analysis methods, microscopic methods, indices of microbial quality	15
UNIT III	Food Additives Brief overview, classification, guidelines for use, MAQ of food additives, toxicological studies, tests to determine safe level – Acute test, prolonged test, chronic test	15
UNIT IV	Food Adulteration Meaning, detection of common adulterants. PFA laws related to food adulteration	15

References:

- Singhal, R. S. (1997) *Handbook of indices of food quality and authenticity*. Cambridge Woodhead Publishing, New York.
- Langree, K. (1996) *Quantity Food Sanitation* 5th edition John Wiley and Sons, New York.
- McSwane, D. (1998) *Essentials of Food Safety and Sanitation* 1st edition, Prentice – Hall, Inc, New Jersey
- Roday, S. (1999) *Hygiene and sanitation in food industry*, Tata McGraw Hill Pub. Co. Ltd.
- Potter, N. H. (1997) *Food Science*, 5th edition, New Delhi, CBS Publishers and distributors New Delhi
- Negi, J. (2004) *Food and Beverage Laws: Food Safety and Hygiene*, Amar Prakashan New Delhi.
- Khanna, S. (2003) *Food Standards and Safety in a globalised world*. The Impact WTO and Codex.
- McWilliams, M. (2000) *Foods Experimental Perspectives*, 4th edition, Prentice-Hall, Inc New Jersey.
- PFA ISI latest guidelines to be referred.

Course Code	Title	Periods/week	Marks	Credits
PSHSIB302	Advances in Human Nutrition	4	100	4

Objectives:

- To understand the influence of nutrition on human growth and development.
- To study about the nutritional requirements and adaptations by the human body.
- To get an insight into the role of Nutrition for fitness and sports.
- To update knowledge in the area of Human Nutrition.

Course Content		Periods
UNIT I	Contemporary issues in macronutrient metabolism and regulatory nutrients i.e. water and fat soluble vitamins and minerals. Nutritional requirements Proteins, energy (energy metabolism) vitamins and minerals determination of nutrient needs	15

	RDA for Indians	
UNIT II	Nutritional requirements for special conditions Extreme climatic conditions Space Nutrition Calamities, disorders and emergencies Nutritional adaptations Underlying mechanism Biochemical basis for adaptation Long and Short term adaptation Adaptation in chronic, severe under-nutrition and over-nutrition. Metabolic consequences of starvation.	15
UNIT III	Growth and development General aspects of Human Growth Cellular and physical growth	15
UNIT IV	Nutrition and the Brain Nervous system and Nerve Cell Nutrient precursors of neuro-transmitters. Nutrition and behavior Effect of under-nutrition on neuronal development.	15

References:

- Benordot, D. (1999) *Nutrition for serious athletes and advanced guide to foods, fluids and supplements for training and performance campaign* IL. Human Kinetic.
- Grodd, J.L. and Gropper, S.S. (1999) *Advanced nutrition and human metabolism*. Belmont CA Wodworth/ Thomson learning.
- Broch, Judith E. (1998) *Nutrition Now*, West/Wadsworth International Thomson Pub. Co.
- Williams, C. and Devlin, T.J. (1992) *Foods Nutrition and Sports performance* E and N Sposs I Ed.
- Goodhart, R.S.S and Shils, M.E. (1998) *Modern nutrition in health and disease*. Philadelphia Lea and Febiger.
- Stipanuk, Martha H. (2006) *Biochemical, physiological, molecular aspects of human nutrition* – Saunders ELSEVIER.
- Paul, I., Turner, E.R. and Ross, Don (2006) (2nd Ed.) *Discovering nutrition* – Jones and Bartlett Publishers – Canada.
- Geissler, C. and Powers, H. (11th Ed.) (2005) *Human nutrition* ELSEVIER Churchill Livinstone ISBN
- 2legler, E.E and Filer, L.J. (1996) *Present knowledge in nutrition*. Washington D.C. International Life Sciences institute.

Journals:

- Journal of American Dietetic Association USA – The American Dietetics Association.
- Nutrition reviews, New York Springton verlog
- The American – Journal of clinical Nutrition – USA Official journal of the American Society for Clinical Nutrition Inc.
- The Indian journal of Nutrition and dietetics.

Course Code	Title	Periods/week	Marks	Credits
PSHSIB303	Management and Business Administration	4	100	4

Objectives:

- To enhance personal & professional performance.
- To facilitate better administration & management skills

Course Content		Periods
Unit I	Developing and Managing Human Resources. An overview of: Job Analysis Job Design Job Evaluation	15
Unit II	Developing and Managing Human Resources.	15

	An overview of: Manpower planning Recruitment and Selection Orientation and Induction Performance Appraisal	
Unit III	Developing and Managing Human Resources. An overview of: Leadership and Motivation Self Awareness Training and Development Compensation and Reward Group Dynamics: Grievance Management, Conflict Resolution. Human Resource Audit.	15
Unit IV	Marketing and Marketing Management process A brief exposure to: Meaning and importance of Marketing Marketing Mix-elements, factors influencing marketing mix Market Research Market Segmentation Supply Chain Management	15

References:

- Agarwal, T. (2007) *Strategic human resource management* Oxford University Press – New Delhi.
- Aswathappa, K. (2005). *Human resource and personnel management – Text and Cases* Tata McGraw – Hill Publishing Co. Ltd. New Delhi.
- Boyd, H.W., Walker, O.C. and Larreche, J. (1995) *Marketing management – A strategic approach with a global orientation* 2nd ed. Irwin Chicago.
- Cartwright, R., Collins, M., Green, G. and Candy, A. (2001). *The handbook for managing resources and information* Infinity books, New Delhi.
- Ivancevich, J.M., Donnelly, J.H. and Gibson, J.L. (1996). *Management – principles and functions* (4th Ed.) All India Traveller Bookseller. Delhi.
- Kale, N.G. (2003) *Principles and practice of marketing*. Vipul prakashan – Mumbai.
- Kotler, P. (2003) *Marketing management* 11th ed. Pearson Education (Singapore) Pte. Ltd. Delhi.
- Rao, V.S.P. (2005) *Human resource management – text and cases* (2nd Ed.) Excel Books. New Delhi.
- Shookla, M.S. (2004). *A handbook of human relations (with structured experiences and instruments)*. Macmillan India Ltd. Delhi.
- Singh, P.N. (1998). *Developing and managing human resources* (3rd ed.) Suchandra Publications. Mumbai.

Course Code	Title	Periods/week	Marks	Credits
PSHSIBP301	Food Quality Control	4	100	4

Objectives

- To learn quality control measures as per domestic and international requirements.
- To conduct physical, chemical and nutritional analysis of commonly consumed raw and processed foods and the impact of packaging on quality.
- Be familiar with various tests and standards used for quality assurance used for food safety hazards, contaminants, adulterants, waste management and implementation of HACCP at various food service and industrial units.

Course Content	Periods
Unit I Techniques of sampling and grading of foods as per BIS, AGMARK and International standards.	15
Unit II Complete physico chemical analysis of any two commonly used foods such as flour, honey and oils, as per their constituents: Crude Fat, Protein, Moisture, Ash, FFA, Vitamin C and any other parameters.	15
Unit III Complete physico chemical analysis of any two commonly used foods such as tea, milk, jams and jellies as per their constituents: Crude Fat, Protein, Moisture, Ash, FFA, Vitamin C and any other parameters.	15

Unit IV	Analysis of water from at least five different sources as per BIS standards, its hardness and safety. Estimation of anti nutritional factors like trypsin inhibitors and phytic acid.	15
----------------	--	-----------

References:

Bureau of Indian standards: specifications and standard methods volume I to XII.

Food and Agriculture organization (1980) *Manual of food quality control 2. Additives contaminants Techniques*, Rome.

Kirk, B.S, and Sawyer, R. (1991) *Pearson's composition and analysis of foods*, (9th ed.) Longmans scientific and Technical England.

Mahindru, S.N. (2000). *Food safety - a techno legal analysis* Tata McGraw Hill Publishing Co. Ltd New Delhi.

Nielson, S.S. (1994) *Introduction to the chemical analysis of foods* Jones and Bartlet Publishers Boston.

SEMESTER IV

Course Code	Subject	Internal Marks	Semester End Examination	Total marks	Periods / week	Credits
PSHSIB401	Food Safety& Quality Control	40	60	100	4	4
PSHSIB402	Advances in Human Nutrition	40	60	100	4	4
PSHSIB403	Management & Business Administration	40	60	100	4	4
PSHSIBP401	Food Quality Control	—	100	100	4	4
PSHSIBP402	Project	—	100	100	4	4
PSHSIBP403	Internship	—	100	100	4	4
	TOTAL			600	24	24

Course Code	Title	Periods/week	Marks	Credits
PSHSIB401	Food Safety and Quality Control	4	100	4

Objectives

- To acquire knowledge about quality and safety aspects of food.
- To learn about the various ways of evaluating and controlling food quality.

Course Content		Periods
UNIT I	Food Labeling and Nutrition Labeling Health Claims, Nutrition Claims, Nutrient definitions allowed on food labels. Laws related to food labeling.	15
UNIT II	Food Safety, Hazards and Risks Meaning, definition, Types of hazards – Biological hazards, physical hazards, chemical hazards, nutrition – related diseases. Risk assessment and management. Natural toxicants in foods, pesticide residues in foods – Assessment and elimination, investigation of food borne disease outbreaks	15
UNIT III	Hygiene and Sanitation Principles of food hygiene, personal hygiene, kitchen hygiene and sanitation. Microbiology in food plant sanitation, water quality assessment, insect and pest control, waste treatment and disposal, food vending and packaging standards, employees' health	15
UNIT IV	Control of Food quality Principles of quality control. Government regulations (Food laws, orders) and amendments and national and international standards – ISI, Agmark, FPO, codex Alimentarius, ISO. Role of FDA in India Management systems in food quality control HACCP, TQM and concept of food audit	15

References

- Singhal, R. S. (1997) *Handbook of indices of food quality and authenticity*. Cambridge Woodhead Publishing, New York.
- Langree, K. (1996) *Quantity Food Sanitation* 5th edition John Wiley and Sons, New York.
- McSwane, D. (1998) *Essentials of Food Safety and Sanitation* 1st edition, Prentice – Hall, Inc, New Jersey.
- Roday, S. (1999) *Hygiene and sanitation in food industry*, Tata McGraw Hill Pub. Co. Ltd.
- Potter, N. H. (1997) *Food Science*, 5th edition, New Delhi, CBS Publishers and distributors, New Delhi.
- Negi, J. (2004) *Food and Beverage Laws: Food Safety and Hygiene*, Amar Prakashan, New Delhi.
- Khanna, S. (2003) *Food Standards and Safety in a globalised world*. The Impact WTO and Codex.
- McWilliams, M. (2000) *Foods Experimental Perspectives*, 4th edition, Prentice-Hall, Inc. New Jersey.
- PFA ISI latest guidelines to be referred.

Course Code	Title	Periods/week	Marks	Credits
PSHSIB402	Advances in Human Nutrition	4	100	4

Objectives

- To understand the influence of nutrition on human growth and development.
- To study about the nutritional requirements and adaptations by the human body.
- To get an insight into the role of Nutrition for fitness and sports.
- To update knowledge in the area of Human Nutrition.

Course Content		Periods
UNIT I	Nutrition and Physical fitness Basic components of energy formation during exercise. Interrelationship of Carbohydrate, Protein and Lipid metabolism Biochemical assessment of physical exertion	15
UNIT II	Nutrition and Physical fitness Effect of nutritional status on physical performance. Ergogenic aids. Eating disorders among athletes Role of water, electrolytes, vitamins & minerals in physical fitness	15

UNIT III	Complementary Nutrition & Other components with health relevance Bioactive Dietary Components Nutraceuticals and Functional foods in Human Nutrition Phytochemicals Carotenoids Plant sterols Polyphenolics Phytoestrogens Polyols	15
UNIT IV	Complementary Nutrition & Other components with health relevance Prebiotics and probiotics Dietary Supplements Vitamins and minerals Natural Health products Moderate and megadosing	15

References

- Benordot, D. (1999) *Nutrition for serious athletes and advanced guide to foods, fluids and supplements for training and performance campaign* IL. Human Kinetic.
- Grodd, J.L. and Gropper, S.S. (1999) *Advanced nutrition and human metabolism*. Belmont CA Wodworth/ Thomson learning.
- Broch, Judith E. (1998) *Nutrition Now*, West/Wadsworth International Thomson Pub. Co.
- Williams, C. and Devlin, T.J. (1992) *Foods Nutrition and Sports performance* E and N Sposs I Ed.
- Goodhart, R.S.S and Shils, M.E. (1998) *Modern nutrition in health and disease*. Philadelphia Lea and Febiger.
- Stipanuk, Martha H. (2006) *Biochemical, physiological, molecular aspects of human nutrition* – Saunders ELSEVIER.
- Paul, I., Turner, E.R. and Ross, Don (2006) (2nd ed.) *Discovering nutrition* – Jones and Bartlett Publishers – Canada.
- Geissler, C. and Powers, H. (11th ed.) (2005) *Human nutrition* ELSEVIER Churchill Livinstone ISBN 21egler, E.E and Filer, L.J. (1996) *Present knowledge in nutrition*. Washington D.C. International Life Sciences institute.

Journals

- Journal of American Dietetic Association USA – The American Dietetic Association.
- Nutrition reviews, New York Springton verlog
- The American – Journal of clinical Nutrition – USA Official journal of the American Society for Clinical Nutrition Inc.
- The Indian journal of Nutrition and dietetics.

Course Code	Title	Periods/week	Marks	Credits
PSHSIB403	Management and Business Administration	4	100	4

Objectives

- To enhance personal & professional performance.
- To facilitate better administration & management skills

Course Content	Periods
Unit I Financial issues: An overview of: Budgeting Concepts of cost : Fixed and variable cost, marginal cost, opportunity cost, break even analysis Sources of finance Auditing Evaluation parameters	15
Unit II Quality Management Approaches to quality improvement Tools used in the process Issues for quality improvement Standards of quality in food industry.	15

Unit III	Entrepreneurship in food service Starting a business Legal requirements Skills and knowledge needed. Planning strategies for marketing products.	15
Unit IV	Managing information: The need for information Sharing and retrieving information. Ethics and social responsibility Meaning Responsibilities of internal & external beneficiaries.	15

References

- Agarwal, T. (2007) *Strategic human resource management* Oxford University Press – New Delhi.
- Aswathappa, K. (2005). *Human resource and personnel management – Text and Cases* Tata McGraw – Hill Publishing Co. Ltd. New Delhi.
- Boyd, H.W., Walker, O.C. and Larreche, J. (1995) *Marketing management – A strategic approach with a global orientation* 2nd ed. Irwin Chicago.
- Cartwright, R., Collins, M., Green, G. and Candy, A. (2001). *The handbook for managing resources and information* Infinity books, New Delhi.
- Ivancevich, J.M., Donnelly, J.H. and Gibson, J.L. (1996). *Management – principles and functions* (4th ed.) All India Traveller Bookseller. Delhi.
- Kale, N.G. (2003) *Principles and practice of marketing*. Vipul prakashan – Mumbai.
- Kotler, P. (2003) *Marketing management* 11th ed. Pearson Education (Singapore) Pte. Ltd. Delhi.
- Rao, V.S.P. (2005) *Human resource management – text and cases* (2nd ed.) Excel Books. New Delhi.
- Shookla, M.S. (2004). *A handbook of human relations (with structured experiences and instruments)*. Macmillan India Ltd. Delhi.
- Singh, P.N. (1998). *Developing and managing human resources* (3rd ed.) Suchandra Publications. Mumbai.

Course Code	Title	Periods/week	Marks	Credits
PSHSIBP401	Food Quality Control	4	100	4

Objectives

- To learn quality control measures as per domestic and international requirements.
- To conduct physical, chemical and nutritional analysis of commonly consumed raw and processed foods and the impact of packaging on quality.
- Be familiar with various tests and standards used for quality assurance used for food safety hazards, contaminants, adulterants, waste management and implementation of HACCP at various food service and industrial units.

Course Content		Periods
Unit I	Indian Standards for the following foods : Wheat flour, Semolina, Bakery products, vegetables, fruits and their products, spices & condiments, and Processed foods.	15
Unit II	Determination of colour, flavour and texture in at least 2 commonly consumed foods like fruit squashes, apple biscuits etc. using sensory and objective evaluation using Spectrophotometer, , Texturrometer, Penetrometer or any other instruments.	15
Unit III	Sensory evaluation of different types of food products. Tomato sauce, ice cream, tea & coffee etc.	15
Unit IV	Microbial analysis of certain raw, processed and roadside foods.	15

References:

- Bureau of Indian standards: specifications and standard methods volume I to XII.
- Food and Agriculture organization (1980) *Manual of food quality control 2*. Additives contaminants Techniques, Rome.
- Kirk, B.S, and Sawyer, R. (1991) *Pearson's composition and analysis of foods*, (9th ed.) Longmans scientific and Technical England.
- Mahindru, S.N. (2000). *Food safety - a techno legal analysis* Tata McGraw Hill Publishing Co. Ltd New Delhi.
- Nielson, S.S. (1994) *Introduction to the chemical analysis of foods* Jones and Bartlet Publishers Boston.

Scheme of Examination

The performance of the learners shall be evaluated into two parts. The learner's performance shall be assessed by Internal Assessment with 40% marks in the first part by conducting the Semester End Examinations with 60% marks in the second part. The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below:-

Internal assessment for Theory 40 %

Sr. No	Evaluation type	Marks
1	One seminar based on curriculum assessed by teacher of the institution teaching PG learners / Publication of a research paper/ presentation of a research paper in seminar or conference. A. Selection of the topic, introduction, write up, references- 15 marks. B. Presentation with the use of ICT- 15 marks.	30
2	Active participation in routine class instructional deliveries	05
3	Overall conduct as a responsible learner, communication and leadership qualities in organizing related academic activities	05

Semester End Theory Examination 60 %

Semester End Theory Examination of 60 marks (three unit courses)

Duration: These examinations shall be of two and half hours duration.

Theory question paper pattern:

- There shall be five questions each of 12 marks. On each unit there will be one question and the first one will be based on entire syllabus.
- All questions shall be compulsory with internal choice within the questions. Each question will be of 18 to 20 marks with options.
- Question may be subdivided into sub-questions a, b, c... and the allocation of marks depend on the weightage of the topic.

Practicals Semester End Examination of 100 marks (No Internal Assessment)

Sr. No	Evaluation type	Marks
1	Laboratory work: Semester End Examination	80
2	Journal	10
3	Viva	10

*Examination for project and internship will be conducted in the form of presentation and viva.

Standard of Passing is as per the ordinances set by the University of Mumbai for the Credit Based Semester and Grading System for the postgraduate courses.