Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Home Science

Choice Based Credit System (CBCS) in Light of NEP-2020

DUAL DEGREE PROGRAM (B.Sc. - M.Sc. Food and Nutrition)

B. Sc. Food and Nutrition Sem III (2021-2024)

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 301	CC	Food Preservation	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will -

CEO1: acquire knowledge pertaining to principles and methods of preserving foods.
CEO2: develop ability in preparing and preserving various foods by household methods.
CEO3: understand the different methods of cooking food.

Course Outcomes (COs): Student should be able to -

CO1: acquaint with principles of preservation of foods.
CO2: familiarize about high temperature and low temperature food processing.
CO3: understand the basic concepts of drying and dehydration and irradiation.
CO4: acquaint with salt and sugar preservation methods.
CO5: understand the latest method of food preservation.

Syllabus

UNIT I

Food preservation: causes of food spoilage, principles, classification of preservation methods. Types of food on the basis of shelf life.

UNIT II

Preservation at high temperature: canning, blanching, pasteurization, sterilization and evaporation. Preservation at low temperature: chilling, cold storage and freezing.

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Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT III

Preservation by drying dehydration and concentration: principle, methods and effect on quality.
Preservation by radiation: definition, methods of Irradiation, direct & indirect effect, measurement of radiation dose, dose distribution and effect on microorganisms.

UNIT IV

Chemical preservation and Bio preservation: principle, types and effects on human health.
Preservation by salt & sugar: principle, method and effect on food quality.
Preservation by fermentation: definition, types and benefits of fermented foods.

UNIT V

Recent methods in food preservation: pulsed electric field processing, high pressure processing, processing using ultrasound, dielectric, ohmic and infrared heating.

Suggested readings:

- Desrosier, N.W., & Desrosier, J.N. (2019). ***The Technology of Food Preservation***. Chennai: CBS publishing.
- Fellows, P.J. (2018). ***Food Processing Technology: Principles and Practice***. India: Wood-head publishing ltd.
- Karel, M., & Fenema, O.R. (2018). ***Physical principles of Food Preservation***. New York: Marcel Dekker publisher.
- Rahman, M. (2019). ***Handbook of food preservation***. Boca Raton: CRC Press.

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			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 301(P)	SEC	Food Preservation	0	0	0	30	20	0	0	4	2

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will -

CEO1: learn skills for food preservation techniques for fruits and vegetables.

Course Outcomes (COs): Student should be able to-

CO1: acquire skills by doing techniques for food preservation.

FSN 301 (P): Food Preservation

- Introduction to Food Science laboratory.
- To perform different types of blanching of fruits and vegetables.
- To perform different types drying in fruits and vegetables.
- To perform cut out analysis of caned product.
- Preservation of fruits by high concentration of sugar i.e., jam.
- Preservation of fruit and vegetable by high concentration of salt/acid i.e., pickle.
- Preservation of food by addition of chemicals i.e., tomato ketchup.
- Preservation of fruits & vegetables by freezing.

Suggested readings:

- Desrosier, N.W., & Desrosier, J.N. (2019). ***The Technology of Food Preservation***. Chennai: CBS publishing.
- Fellows, P.J. (2018). ***Food Processing Technology: Principles and Practice***. India: Wood-head publishing ltd.
- Karel, M., & Fenema, O.R. (2018). ***Physical principles of Food Preservation***. New York: Marcel Dekker publisher.
- Rahman, M. (2019). ***Handbook of food preservation***. Boca Raton: CRC Press.

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			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assess-ment	End Sem University Exam	Teachers Assess-ment				
FSN 302 E1	DSE	Hygiene and Public Health	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will -

CEO1: comprehend about importance of hygiene and determinants of health.
CEO2: gain knowledge about immunity and immunization schedules.
CEO3: gain knowledge about water and food borne diseases and their control.

Course Outcomes (COs): Student should be able to -

CO1: develop profound understanding regarding health and its dimensions and national data.
CO2: gain knowledge about immunity and immunization schedule.
CO3: get acquire knowledge regarding water and water related concerns and waste management.
CO4: understand the concept of epidemiology, communicable diseases, and their control.
CO5: enhance knowledge regarding food borne diseases, methods of detection and prevention.

Syllabus

UNIT I

Dimension of Health: indicators and positive health versus absence of disease.

Secondary sources of community health data: sources of relevant vital statistics of infant, child & maternal mortality rates.

UNIT II

Immunity: introduction, types of immunity and factors affecting immunity.

Immunization: importance, national and international immunization schedule.

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			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 302 E1	DSE	Hygiene and Public Health	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT III

Community water and waste management: importance of water to the community, sources of water, potable water, etiology, effects of toxic agents and water borne infectious agents. Waste disposal: solid waste disposal, liquid waste disposal and its treatment.

UNIT IV

Concept of Epidemiology: study of the epidemiologic approach-determinants of disease preventive & social means. Communicable and infective disease control: nature of communicable and infectious diseases, infection, contamination, disinfections, decontamination, transmission-direct & indirect, vector borne disease infecting organisms.

UNIT V

Public health hazards due to contaminated foods: food borne infections and intoxications: symptoms, mode of transmission and methods of prevention, investigation and detection of food borne disease.

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			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 302 E1	DSE	Hygiene and Public Health	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Suggested readings:

- Mahajan, B.K., & Gupta, M.C. (2016). ***Textbook of Preventive and Social Medicine***. London: Jaypee Brothers Medical Publishers.
- Smith, G.W. (2014). ***Preventive Medicine and Public Health***. London: Macmillan Publishers.
- Vir, S.C. (2012). ***Public Health Nutrition in Developing Countries***. India: Woodhead Publishing

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			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 303	CC	Basic Nutritional Biochemistry	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will -

CEO1: ingrain the understanding regarding macronutrients and their metabolism.
CEO2: comprehend about different pathways for macronutrients.

Course Outcomes (COs): Student should be able to -

CO1: develop profound knowledge regarding macronutrient in respect of biochemistry.
CO2: comprehend with carbohydrate metabolism by learning various cycles.
CO3: enhance knowledge about lipids.
CO4: learn protein metabolism.
CO5: understand nucleic acid and nucleoproteins.

Syllabus

UNIT I

Carbohydrates, Proteins and Lipids: definition, classification, structure, functions, digestion and absorption.

UNIT II

Carbohydrate metabolism: glycolysis, TCA cycle & energy generation, HMP Shunt pathway, gluconeogenesis, glycogenesis, glycogenolysis and blood sugar regulation. Determination of amount of reducing and non – reducing sugar. Chemistry of starch, glycogen, cellulose, mucilage and crude fibre.

UNIT III

Lipids: oxidation and biosynthesis of fatty acids (saturated & mono-unsaturated), synthesis and utilization of ketone bodies, Ketosis, fatty livers, role of essential Fatty acids (Omega 3 and Omega 6 Fatty acid), cholesterol and its clinical significance.

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
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FSN 303	CC	Basic Nutritional Biochemistry	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT IV

Metabolism of proteins: biologically important peptides and their role in the regulation of amino acid metabolism. Trans-amination, deamination and decarboxylation. Amino acid sequence of proteins.

UNIT V

Purines, Pyrimidines and Nucleic acids: introduction, chemistry and its biological importance.

Suggested reading:

- Brody, T. (2015). ***Nutritional Biochemistry***. India: Elsevier Science Publishing.
- Nayak, S. (2021). ***Handbook of Biochemistry and Nutrition***. India: Jaypee Brothers Medical Publishers.
- Robbins, D. (2022). ***Nutritional Biochemistry and Metabolism***. Wilmington: Kaufman Press.
- Satyanarayana, U., & Chakrapani, U. (2021). ***Biochemistry.*** Kolkata: Elsevier.
- Sharma, D.C. (2017). ***Nutritional Biochemistry***. Kolkata: CBS Publishers & Distributors.

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			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 302 E2	DSE	Food Packaging	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will -

CEO1: acquire knowledge regarding packaging and its types
CEO2: understand the role of packaging in prevention of deterioration.

Course Outcomes (COs): Student should be able to-

CO1: learn the concept of packaging and how different types of packaging prevents deterioration.
CO2: acquire knowledge regarding perishable and processed food.
CO3: comprehend with different packaging material specific for food items.
CO4: learn advancement in packaging industry.

UNIT I

Packaging: concepts, definition, significance, classification and properties.
Deteriorative changes in food and packaging methods for prevention.

UNIT II

Factors determining the packaging requirements of various foods. Packaging of perishable and processed foods.

UNIT III

Primary packaging material: properties and application of Paper, paper boards, metals, plastics and glass.

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			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 302 E1	DSE	Food Packaging	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT IV

Methods of different packaging materials in food industry: bags, pouches, wrappers, cartons, films etc.

UNIT V

Advancements in packaging: biodegradable packaging, edible packaging, active packaging, modified atmosphere packaging, controlled, vacuum packaging and aseptic packaging.

Suggested reading:

- Heather, Y., & Frank, P. (2018). ***Handbook of Food Packaging***. India: Indian Institute of Packaging.
- Robertson, G.L. (2016). ***Food Packaging: Principles and Practice***. Boca Raton: Taylor & Francis.
- Vartiainen, Jari. (2019). ***Food Packaging Materials*****.** Usana: Excellic Press.