Subject Code	Category	Subject Name	Teaching and Evaluation Scheme					L	T	P	CREDITS
			Theory			Practical					
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 101	CC (Major)	Introduction to Human Nutrition	60	20	20	0	0	4	0	0	4

Course Educational Objectives (CEOs): The students will

CEO1: develop understanding about human nutrition components and their requirements.

CEO2: gain knowledge about role of various nutrients, sources and storage.

CEO3: orient about effect of excess and deficiency of nutrient in the body.

Course Outcomes (COs): Student should be able to

CO1: understand the role of various nutrients, its digestion and absorption in the body.

CO2: comprehend about energy metabolism and concept of balanced diet

CO3: recognize functions, sources, requirement, storage, effect of deficiency and excess of macro nutrients.

CO4: recognize functions, sources, requirement, storage, effect of deficiency and excess of micronutrients.

Syllabus

UNIT I

Introduction to human nutrition: macronutrients and micronutrients.

Food: types, functions, digestion, absorption and assimilation of nutrients.

UNIT II

Energy metabolism- components of energy expenditure, Basal Metabolic Rate, Recommended Dietary Allowances, concept of a balanced diet and methods of evaluation of nutritive value of foods.

UNIT III

a) Carbohydrates- Types, functions, sources, requirement, storage, Effect of deficiency and excess.

b) Proteins- Types, functions, sources, requirement, storage, Effect of deficiency and excess.

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Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical					
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment	L	T	P	CREDITS
FSN 101	CC (Major)	Introduction to Human Nutrition	60	20	20	0	0	4	0	0	4

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

a) Fat- Types, functions, sources, requirement, storage, Effect of deficiency and excess.
b) Vitamin- Types, functions, sources, requirement, storage, Effect of deficiency and excess.

UNIT V

a) Minerals- Types, functions, sources, requirement, storage, Effect of deficiency and ex-cess.
b) Water and electrolytes- Concept, importance and functions.

Suggested reading:

- Bamji, M. S. Krishnaswamy, K. & Brahmam, G. N. V. (2013). *Textbook Of Human Nutrition*. Oxford & IBH.
- Srilakshmi, B. (2017). *Nutrition Science*. Delhi: New Age International Publishers.
- Potter, N. N. and Hotchkiss, J. H. (2012). *Food Science*. Germany: Springer Science & Business Media.
- Swaminathan, M. (2005*). Handbook of Foods and Nutrition*. Madras: Ganesh and Co. Pvt. Ltd.

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme									
			Theory			Practical						
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment	L	T	P	CREDITS
FSN 102	CC (Major)	Nutrition Lab	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: experience different food group products available in the market and also gain knowledge about various nutritive value enhancing processes like - germination & fermentation

CEO2: learn about various taste enhancer processes in food like Enzymatic Browning and Caramelization.

CEO3: gain knowledge about skeleton system and organ systems of human.

CEO4: learn various blood estimations with the help of kit and also comprehend about blood groups and coagulation of blood.

Course Outcomes (COs): Student should be able to

CO1: distinguish different food groups and their products with emphasis on nutritive values.

CO2: familiar Increase the nutritive value of food with the help of processes like germination and fermentation

CO4: recall the basic structure and functions of Human Skeleton and Human organs.

CO2: acquainted with blood estimations – hemoglobin and blood pressure

CO3: understand about blood groups and coagulation of blood

List of Practical's.

1. Market survey of locally available food items viz. cereals, pulses, fruits, vegetables, milk and milk products, fats and oils, nuts and oilseeds, sugar and jaggery, meat, fish, and poultry and miscellaneous food items like biscuits, jams, jellies, ketchup etc.
2. Introduction to different culinary terms
3. To study germination and fermentation of pulses and legumes.
4. To study enzymatic and non-enzymatic browning such as caramelization in various sugars.
5. To study human systems and human skelton through charts & models.
6. Blood Cells: Fresh mount and stained. Determination of blood group.

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Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme									
			Theory			Practical						
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment	L	T	P	CREDITS	
FSN 102	CC (Major)	Nutrition Lab	0	0	0	30	20	0	0	4	2

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

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7. Measurement of blood pressure using sphygmomanometer.

Suggested readings:

- Srilakshmi, B. (2017), *Nutrition Science*. Delhi: New Age International Publishers.
- Many, N. S. O. (2001). *Food: facts and principles*. Delhi: New Age International.
- Potter, N. N., & Hotchkiss, J. H. (2012). *Food science*. Germany: Springer Science & Business Media.
- B. Srilakshmi (2018*). Food Science.* Delhi: New Age International Publishers.
- Sharma, Avantina*. Textbook of Food Science and Technology*. Tamil Nadu: CBS publication and Distributors Pvt. Ltd.

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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 103	CC (Minor)	Human Physiology I	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: understand basic unit of life and the physiology of various organ systems in human body.

CEO2: develop profound knowledge regarding regulation and function of various organs in the body.

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

CO1: recall the basic structure and functions of cell and cell organelles.

CO2: acquainted with the regulation and function of blood and circulatory system.

CO3: understand the regulation and function of digestive system.

CO4: memorize the regulation and function of respiratory and musculoskeletal system.

Syllabus

UNIT I

Unit of Life: Structure and functions of cell with special reference to Plasma membrane, (Fluid Mosaic Model), Mitochondria, Ribosome, Endoplasmic reticulum, Nucleus (nuclear mem- brane, nuclear chromatin and nucleolus). Nucleotide, Homeostasis, Positive and Negative feedback.

UNIT II

Circulatory and Cardiovascular system: Blood and its composition, formed elements, Blood groups, blood coagulation, Erythropoiesis and anaemia.
Introduction to immune system, structure and functions of heart, cardiac cycle, cardiac output, blood pressure and its regulation.

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme					L	T	P	CREDITS
			Theory			Practical					
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 103	CC (Minor)	Human Physiology	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
Digestive System: Structure and functions of G.I. tract, Process of digestion and absorption of food**,** Structure and functions of liver, gallbladder and pancreas.

UNIT IV

Respiratory System: Structure of Lungs and gaseous exchange (oxygen and carbon dioxid**e** transport).

UNIT V
Musculoskeletal System: Formation and functions of muscles, bones.
Mechanism of muscle contraction, isometric and isotonic muscle contraction.

Suggested readings:
1. Chaterzee (1988). *Human Physiology*, Calcutta: Medical agency.
2. Pears, E.C. (2017) *Anatomy and Physiology for nurses*, Delhi: Oxford University.
3. Gyton A.C., Hall , J.E. (1996). *Textbook of medical physiology*, Bangalore: Prism Books (Pvt) ltd.

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Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme					L	T	P	CREDITS
			Theory			Practical					
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 104	CC(Minor)	Food Science I	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: know the classification of foods into different groups.
CEO2: gain knowledge about the composition and nutritive value of different foods.
CEO3: understand the different methods of cooking food.

Course Outcomes (COs): Student should be able to
CO1: understand the differentiation between food groups, their composition and role in the diet.
CO2: familiarize about the nutritional importance of cereals, pulses and legumes.
CO3: conversant about the nutritional importance of milk and milk products.
CO4: demonstrates the various stages of sugar.
CO5: recognize role of water and water activity in foods.

Course Contents

UNIT I
Concept of Food science and its application. Definitions of Food, Nutrition, Nutrients, Macronutrients, Micronutrients, Food Groups, Classification of foods, Food technology and Future foods- Biofortification, Nutraceuticals, Organic foods.

UNIT II
Cereals and Pulses: composition and nutritive value of wheat, rice, their milling and processing, storage, use in various preparations, breakfast cereals, millets like jowar, ragi, bajra, cereal cookery. Pulses and legumes- nutritive value, processing, storage, toxic constituents, pulse cookery, variety.

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Vishwavidyalaya, Indore	Vishwavidyalaya, Indore		

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme					L	T	P	CREDITS
			Theory			Practical					
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
FSN 104	CC	Food Science I	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
Milk and milk products- composition, nutritive value, effect of heat, acid and enzymes, processing, storage, milk products (cheese, paneer, ice cream, ghee, butter, flavored milk, imitation milk).

UNIT IV

Sugar and related products- nutritive value, properties, sugar related products, stages in sugar cookery, artificial sweeteners.

UNIT V
Water in foods - Introduction, physical properties of water, structure of water molecule, Types of water and water activity.

Suggested reading:

- B, Srilakshmi. (2017). *Nutrition Science*. Delhi: New Age International Publishers.
- Manay N. S. O. (2001). *Food: facts and principles*. Delhi: New Age International.
- Potter, N. N. & Hotchkiss, J. H. (2012). *Food Science*. Germany: Springer Science & Business Media.
- B, Srilakshmi. (2018). *Food Science*. Delhi: New Age International Publishers.
- Sharma, Avantina. *Textbook of Food Science and Technology*. Tamil Nadu: CBS publication and Distributors Pvt. Ltd.

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