Bhavan

BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES & COMMERCE
Sainikpuri, Secunderabad – 500094
Autonomous College - Affiliated to Osmania University
(Reaccredited with 'A' grade by NAAC)

Department of Biochemistry & Nutrition

Template for B.Sc. Nutrition & Dietetics under CBCS
PROGRAM NAME: BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY (BCNDC)
Academic year 2025-26

FIRST YEAR – SEMESTER-I				
Course Code	Course title	Course Type	HPW	CREDITS
	Environmental Science/Computer Skills	AECC-1	2	2
	English	CC-1A	4	4
	Second Language	CC-2A	4	4
	Optional 1	DSC-1A	4T+2P=6	4+1=5
ND136	**Introduction to Foods & Nutrition**	DSC-2A	4T+2P=6	4+1=5
	Optional 3	DSC-3A	4T+2P=6	4+1=5
	TOTAL		28	25
SEMESTER-II				
	Environmental Science/Computer Skills	AECC-2	2	2
	English	CC-1B	4	4
	Second Language	CC-2B	4	4
	Optional 1	DSC-1B	4T+2P=6	4+1=5
ND236	**Nutritional Biochemistry and Human Physiology**	DSC-2B	4T+2P=6	4+1=5
	Optional 3	DSC-3B	4T+2P=6	4+1=5
	TOTAL		28	25
SECOND YEAR –SEMESTER-III				
	English	CC-1C	3	3
	Second Language	CC-2C	3	3
	Optional 1	DSC-1C	4T+2P=6	4+1=5
ND336	**Normal and Therapeutic Nutrition**	DSC-2C	4T+2P=6	4+1=5
	Optional 3	DSC-3C	4T+2P=6	4+1=5
	Communication Skills	SEC-1	2	2
SE336	**Nutraceuticals, Functional & Novel foods**	SEC-2	2	2
	TOTAL		28	25

S Padma 28/4/25
Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

HEAD
Department of Biochemistry
University College of Science
Osmania University

SEMESTER-IV				
	English	CC-1D	3	3
	Second Language	CC-2D	3	3
	Optional 1	DSC-1D	4T+2P=6	4+1=5
ND436	**Diet in Disease**	DSC-2D	4T+2P=6	4+1=5
	Optional 3	DSC-3D	4T+2P=6	4+1=5
	Universal Human Value	SEC-1	2	2
SE436	**Strategies for weight management**	SEC-4	2	2
	TOTAL		28	25
THIRD YEAR –SEMESTER-V				
	English	CC-1E	3	3
	Second Language	CC-2E	3	3
	Optional 1	DSE-1E	4T+2P=6	4+1=5
ND536/ ND536A	**Clinical Dietetics/ Diet Therapy**	DSE-2E	4T+2P=6	4+1=5
	Optional 3	DSE-3E	4T+2P=6	4+1=5
GE536	**Nutrition and Health**	GE	4T	4
	TOTAL		28	25
SEMESTER-VI				
	English	CC-1F	3	3
	Second Language	CC-2F	3	3
	Optional 1	DSE-1F	4T+2P=6	4+1=5
ND636/ ND636A	**Public Health and Food Technology/ Community Nutrition**	DSE-2F	4T+2P=6	4+1=5
	Optional 3	DSE-3F	4T+2P=6	4+1=5
ND636_O ND636_PW	**Optional Paper Theory – Food Sanitation and Hygiene / Project work**		4	4
	TOTAL		28	25
	TOTAL CREDITS			**150**

Bharatiya Vidya Bhavan

BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES & COMMERCE
Sainikpuri, Secunderabad – 500094
Autonomous College - Affiliated to Osmania University
(Reaccredited with 'A' grade by NAAC)
Department of Biochemistry & Nutrition

PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2025-26)

COURSE NAME: INTRODUCTION TO FOODS & NUTRITION

PAPER CODE: ND136 **PPW: 4**
YEAR/SEMESTER: I/I **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To familiarize the students with various food groups and their nutritive value and to learn about food preservation and adulteration.

UNIT-WISE COURSE OBJECTIVES:

COb1 To describe the balanced diet and different food groups in ancient and modern methods with their nutritive values.
COb2 To explain the composition and nutritive value of pulses, cereals, legumes and fats.
COb3 To discuss the nutritive value of vegetables, fruits and fibre.
COb4 To explain the nutritive value of animal foods.

UNIT I: INTRODUCTION TO FOOD GROUPS, CEREALS, MILLETS & PURE CARBOHYDRATES **15 hours**

1. Definition- Food, nutrition, nutrients; food groups based on functions, origin and nutritive value. Food guide pyramid, balanced diet.
2. Nutrition in Ayurveda- Introduction, Basic principles of Ayurveda (Dosha, dhatu and mala) and their influence on health, concepts of agni and aama
3. Nityopayogiaahaaradravyas (Balanced diet), Classification of aahaaradravayas (Satvik, rajas and tamas foods) and their effects on the body, asthaaahaaravidhi, viruddaahaara (contradictory foods).
4. Cereals and Millets - Composition, nutritive value and nutrient losses during processing; breakfast cereals
5. Sugars - Types of sugars and stages of sugar cookery, Jaggery - Manufacture and stages of jaggery cookery

UNIT II: PULSES & LEGUMES, NUTS & OIL SEEDS AND FATS & OILS 15 hours

1. Pulses & Legumes - Composition, nutritive value, nutrient losses during processing, importance of germination and malting; anti nutritional factors
2. Nuts & Oilseeds – Nutritive value, toxins and role in cookery

S. Padma
28/4/25
Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

HEAD
Department of Biochemistry
University College of Science
Osmania University

3. Fats & Oils – Composition, nutritive value, properties- physical and chemical, functions of oils and fat in foods
4. Rancidity of Oils- Types and prevention

UNIT III: VEGETABLES, FRUITS **15 hours**

1. Vegetables - Classification, composition and nutritive value, changes during cooking, loss of nutrients during cooking, storage, factors affecting storage.
2. Fruits - Classification, composition, nutritive value, storage and ripening.
3. Enzymatic browning and its prevention.
4. Fibre- types, significance and sources

UNIT IV: ANIMAL FOODS **15 hours**

1. Milk- Composition, nutritive value, fermented and non-fermented milk products
2. Egg - Composition, nutritive value and quality.
3. Poultry- Classification, composition and nutritive value
4. Meat - Nutritive Value, Postmortem changes, tenderizers (physical and chemical) and changes during cooking; fish - classification, composition and nutritive value

REFERENCES:

1. Vijaya Khader, Text Book of Food Science and Technology, Indian Council of Agricultural Research, New Delhi, 2016.
2. Srilakshmi B- Food Science, 5th Edition, New Age International Publishers, New Delhi – 110002, 2011.
3. Shakuntala Manay N - Food Facts and Principles, New Age International Publishers, New Delhi – 110002, 2005.
4. Norman Potter N -Food Science, CBS Publishers and Distributors, New Delhi – 110002, 2007.
5. Pradipkumar, R. Suryawanshi, Ahara- Ancient Secret of Diet in Ayurveda & Yoga, ChaukhambaSurbharatiPrakashan, Varanasi, Uttar Pradesh, 2018.
6. Mahadevan B., Textbook on IKS, IIM Bengaluru

COURSE OUTCOMES:

At the end of the course students will be able to:

ND136.CO1 Elaborate various food groups and importance of balanced diet in traditional and modern methods.
ND136.CO2 Formulate the diet based on composition and nutritive value of pulses, legumes and fats.
ND136.CO3 Select types of vegetables, fruits and fibre for healthy diet.
ND136.CO4 Compare the nutritive values of milk, egg, poultry and meat.

Bharatiya Vidya Bhavan

BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES & COMMERCE
Sainikpuri, Secunderabad – 500094
Autonomous College - Affiliated to Osmania University
(Reaccredited with 'A' grade by NAAC)
Department of Biochemistry& Nutrition

PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2025-26)

COURSE NAME: INTRODUCTION TO FOODS AND NUTRITION

PAPER CODE: ND136P **PPW: 2**
YEAR/SEMESTER: I/I **NO.OFCREDITS: 1**

COURSE OBJECTIVE:
COb1 To describe standardization of recipes and nutritive calculations.
COb2 To explain food preservation methods of different foods.

I. Standardization, Preparation and Nutritive value calculation of the recipes based on the following food group and combination.
1. Cereal and millets.
2. Legume and Pulse.
3. Malting and Germination of grains.
4. Cereal-pulse combination
5. Stages of sugar cookery, preparation with jaggery

II 6. Preparation of concoctions (kadha).

III. Methods of Preservation of fruits and vegetables.
7. Fruits- Preparation of Squashes
8. Fruits- Preparation of jams
9. Vegetables- Pickling

IV. 10. Determination of quality of an egg

REFERENCES:

1. Srilakshmi B- Food Science, 5th Edition, New Age International Publishers, New Delhi – 110002, 2011.
2. LongvahT. ,AnanthanR. ,Bhaskarachary K. and Venkaiah K. Indian Food Composition Table, NIN

COURSE OUTCOMES:
At the end of the course students will be able to:
ND136P.CO1 Compare the nutritive values of various food groups and standardize the recipes.
ND136P.CO2 Implement food preservation methods.

S. Padma 28/4/25
Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

HEAD
Department of Biochemistry
University College of Science
Osmania University

Bharatiya Vidya Bhavan
BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES & COMMERCE
Sainikpuri, Secunderabad – 500094
Autonomous College - Affiliated to Osmania University
(Reaccredited with 'A' grade by NAAC)
Department of Biochemistry & Nutrition

PROGRAM NAME:BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2025-26)

COURSE NAME: NUTRITIONAL BIOCHEMISTRY AND HUMAN PHYSIOLOGY

PAPER CODE: ND236 **PPW: 4**
YEAR/SEMESTER: I/II **NO. OF CREDITS: 4**

COURSE OBJECTIVE: To familiarize the students with role of micronutrients and macronutrients in the body and to understand the role of different organ systems.

UNIT-WISE COURSE OBJECTIVES:

COb1 To explain the structural and functional importance of macronutrients.
COb2 To compare the significance, functions and deficiencies of micronutrients.
COb3 To explain the significance of water, its components, enzymes and hormones.
COb4 To discuss the cell structure, immunity, blood and its components, respiratory, nervous system and skin.

UNIT 1: MACRONUTRIENTS **15 hours**

1. Carbohydrates - Composition, classification, sources, functions, deficiency and excess, glycolysis, citric acid cycle, and gluconeogenesis,
2. Lipids - Composition, classification, sources and functions; deficiency and excess of fats, essential fatty acids.
3. Amino acids- Classification - Chemical and nutritional; deamination, transamination, decarboxylation and amino acid pool, supplementary value of aminoacids.
4. Proteins- Composition, classification, sources, functions, biological value of proteins, PDCASS (Protein digestibility-corrected amino acid score), DIAAS (Digestible Indispensible amino acid score), deficiency and excess.

UNIT II: MICRONUTRIENTS **15 hours**

1. Vitamins- Introduction, Classification, fat soluble vitamins A, D, E, K – chemistry, sources, functions, deficiency symptoms, RDA.
2. Water soluble vitamins – (thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, biotin, folic acid, cyanocobalamine, and ascorbic acid) chemistry, sources, functions, deficiency symptoms, RDA.
3. Minerals-Classification, sources, functions and deficiency symptoms of macrominerals (calcium, phosphorus, sodium, potassium and chlorine).

S. Padma
28/4/25
Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

HEAD
Department of Biochemistry
University College of Science
Osmania University

4. Microminerals: Sources, functions and deficiency symptoms (iron, iodine, fluorine, zinc, selenium)

UNIT III: WATER, ELECTROLYTES, ENZYMES AND HORMONES 15 hours

1. Water - Functions, distribution, intake and elimination, water balance
2. Electrolytes - Concentrations in intracellular and extra cellular fluids and osmotic pressure; acid base balance.
3. Enzymes - Definition, classification (IUBMB), properties, mechanism of enzyme action, inhibitors of enzyme action.
4. Hormones- Endocrine glands their secretion and functions, classification of hormones.

UNIT IV: CELL, IMMUNE SYSTEM, BLOOD, RESPIRATORY SYSTEM, NERVOUS SYSTEM AND SKIN 15 hours

1. Cell- Structure & functions, Overview of the Immune system and key features of the immune response.
2. Blood- Composition, coagulation and blood groups.
3. Respiratory system- Parts and functions, mechanism of respiration; oxygen and carbon dioxide transport
4. Nervous system – Classification and functions.
5. Skin: functions and its role in the regulation of body temperature.

REFERENCES:

1. Ferrier, D.R., Lippincott's Illustrated Reviews: Biochemistry, 5th or 6th Edition, Lippincott Williams & Wilkins, Baltimore,
2. Chatterjee C.C., Human Physiology, Vol. I & II, Medical Allied Agency, Calcutta (1987). AVSS Rama Rao - A Text Book of Bio Chemistry, 9th edition, UBS Publishers distribution Pvt.Ltd, 2002.
3. Swaminathan N - A Handbook of Food and Nutrition, 5th edition volume 1, Bangalore printing and publishing Co.Ltd, 1986.
4. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy -Text book of Human Nutrition, 4th edition, Oxford and IBH publishing Co. Pvt. Ltd 2004.
5. Swaminathan M, Advanced Textbook on Food and Nutrition, Vol. I, Bappco.

COURSE OUTCOMES:

At the end of the course students will be able to:

ND236.CO1 Interpret the significance of relation between macronutrient metabolism and health.
ND236.CO2 Choose various sources of vitamins and minerals in planning healthy diet menu.
ND236.CO3 Compile the importance of water, electrolytes, enzymes and hormones.
ND236.CO4 Relate the various organ systems and their functions.

S Padma
28/4/25
Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

HEAD
Department of Biochemistry
University College of Science
Osmania University

Bharatiya Vidya Bhavan

BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES & COMMERCE
Sainikpuri, Secunderabad – 500094
Autonomous College - Affiliated to Osmania University
(Reaccredited with 'A' grade by NAAC)

PROGRAM NAME: BCNDC (BIOCHEMISTRY, NUTRITION & DIETETICS, CHEMISTRY)
(Academic year 2025-26)

COURSE NAME: NUTRITIONAL BIOCHEMISTRY AND HUMAN PHYSIOLOGY

COURSE OBJECTIVE:

COb1 To describe methods of analysis for biomolecules and other nutrients.
COb2 To explain quantitative analysis of clinical parameters in blood.

PAPER CODE: ND236P **PPW: 2**
YEAR/SEMESTER: I/II **NO. OF CREDITS: 1**

1. Qualitative tests of proteins.
2. Quantitative estimation of iron in food samples
3. Quantitative analysis of calcium in by titrimetry in milk.
4. Quantitative analysis of vitamin C in 2,6 dichlorophenolindophenol dye method.
5. Determination of phosphorus by Fiske Subbarao method.
6. Determination of rancidity parameter: Acid value.
7. Determination of rancidity parameter: Peroxide value.
8. Determination of saponification value.
9. **Estimation of beta carotene in food sample**
10. Determination of Bleeding time and clotting time.

REFERENCES

1. Experimental Biochemistry: A Student companion- Sashidhar Rao, B and Deshpande, V. IK International (P) Ltd
2. Raghuramulu, Madhavannair, Kalyansundram, A manual of laboratory techniques, NIN. Hyderabad (2003).
3. Sawhney SK, Randhir Singh, Introductory practical biochemistry, Nasora Publishers, New Delhi (2000).

COURSE OUTCOMES:

At the end of the course students will be able to:
ND236P.CO1 Identify and differentiate the biomolecules and nutrients in food samples.
ND236P.CO1 Analyze the changes in clinical parameters in health and disease.

S. Padma
28/4/25
Head, Dept. of Biochemistry & Nutrition
Bhavan's Vivekananda College,
Sainikpuri, Secunderabad-500094.

HEAD
Department of Biochemistry
University College of Science
Osmania University