2024

B.Sc.NutritionandDietetics

CourseStructureandSyllabus

(Forthecandidatesadmittedfromtheacademicyear2024-2025onwards)

CHOICEBASEDCREDITSYSTEM (CBCS)

THANTHAIHANSROEVERCOLLEGE

(AUTONOMOUS)

(ApprovedbyNAAC,AffiliatedtoBharathidasanUniversity)

ELAMBALUR,PERAMBALUR– 621220

Vision

Ourvisionistoelevatenationalhealthbyfosteringawarenessamongstakeholdersand empoweringstudentstobecomeleadersinNutritionandDietetics.Weaimtodevelopskilled practitioners and experts with a comprehensive understanding of health systems from prevention to palliative care—and to advance research that addresses lifestyle-related health challenges through innovative nutritional solutions.

Mission

1. Tocreateawarenessamongstakeholdersaboutenhancingthenation'shealthstatus.
2. To ensure students remain up to date with the latest developments in the fields of Nutrition andDietetics.
3. Tocultivateexpertsinnutritionpractice,equippedwithdiverseperspectivesacrossthehealth system—from disease prevention to palliation
4. Toprepare ateam of proficient clinical nutrition practitionersdedicated to supporting community health and well-being.
5. To engage students in research and practical applications in nutrition, including the development of new food formulations for the prevention and management of lifestyle-related diseases.

PROGRAMMEOUTCOMES(POs)

1. Capableofdemonstratingcomprehensiveknowledgeandunderstandingofoneormoredisciplinesthat form a part of an undergraduate Programme of study.
2. Abilitytoexpressthoughtsandideaseffectivelyinwritingandorallycommunicatewithothersusing appropriate media.
3. Capabilitytoapplyanalyticthoughttoabodyofknowledgeanalyzeandevaluateevidence,arguments, claims, and beliefs on the basis of empirical evidence.
4. Toextrapolatefromwhat onehaslearnedand appliestheircompetenciestosolvedifferentkindsofnon- familiar problems.
5. Abilitytoevaluatethereliabilityandrelevanceof evidenceidentifylogical flawsandholesinthe arguments of others; analyze and synthesize data from a variety of sources.

PROGRAMMESPECIFICOUTCOMES(PSOs)

Onsuccessful completionofthisprogramme,studentswillbeableto:

1. Abletoprovidenutritioncounselingandeducationtoindividuals,groups,andcommunitiesthroughout the life span using a variety of communication strategies.
2. Inculcateaproblem-solvingmindsetofthestudentsthroughhealthcareandindustrialexposureofreal world problems.
3. Applytheknowledgeofprocessing,preservationandbakerytechniquesindesigningandenhancingthe shelf life of new and existing products.
4. Prepareanddeliverwitheffectivepresentationaidstocreateawarenessonnutritionandhygienetothe general public.
5. Equipthemenoughto do higherstudiesandgo uptoresearch levelto become professionals.

ThanthaiHansRoeverCollege(Autonomous),Elambalur,Perambalur-621220 B.Sc.
Nutrition and Dietetics

CHOICEBASEDCREDITSYSTEM–LEARNINGOUTCOMESBASEDCURRICULUMFRAMEWORK(CBCS-LOCF)

(Forthecandidatesadmitted fromtheacademicyear2024-2025onwards)

Semester	Part	CourseCode	Titleofthe Course	Ins.Hours/ Weeks	Credits	Exam Hours	CIA (Max)	ESE (Max)	Total (Max)
1	I	23UT1/H1/F1	Language-I	6	3	3	25	75	100
1	II	23UE1	English-I	6	3	3	25	75	100
1	III	23UND1CC1	Food science	5	5	3	25	75	100
1	III	23UND1CC2P	Foodscience practical	3	3	3	40	60	100
1	III	23UND1AC1	Generalbiochemistry	5	4	3	25	75	100
1	III	23UND2AP1	Generalbiochemistry-Practical	2	--	--	--	--	100
1	IV	23UND1SE1	SkillEnhancementCourse-1(NME-1)	2	2	3	25	75	
1			ValueAddedCourse		2*				100*
			Total	**30**	**20**				**600**
2	I	23UT2/H2/F2	Language-II	6	3	3	25	75	100
2	II	23UE2	English-II	6	3	3	25	75	100
2	III	23UND2CC3	Humanphysiology	5	5	3	25	75	100
2	III	23UND2CC4P	HumanPhysiology-Practical	3	3	3	40	60	100
2	III	23UND2AC2	Food Chemistry	3	3	3	25	75	100
2	III	23UND2AP1	FoodChemistry-Practical	3	2	3	40	60	100
2	IV	23UND2SE2	SkillEnhancementCourse-2(NME-2)	2	2	3	25	75	100
2	IV	23UND2SE3	Entrepreneurshipdevelopment	2	2	3	25	75	100
			ValueAddedCourse		2*				100*
			Total	**30**	**23**	**-**	**-**	**-**	**800**
3	I	23UT3/H3/F3	Language-III	6	3	3	25	75	100
3	II	23UE3	English-III	6	3	3	25	75	100
3	III	23UND3CC5	NutritionalBiochemistry	4	4	3	25	75	100
3	III	23UND3CC6P	Nutritionalbiochemistry-Practical	3	3	3	40	60	100
3	III	23UND3AC3	GeneralHomescienceI	4	4	3	25	75	100
3	III	23UND4AP2	GeneralHomescience-Practical	3	--	--	--	--	--
3	IV	23UND3SE4	Bakeryscience	2	2	3	25	75	100
3	IV	24UHW	HealthandWealth	1	1	3	25	75	100
		23UGS	Gender studies	1	1	3	25	75	100
			ValueAddedCourse*		2*	2	50	50	100*
			Total	**30**	**21**	**-**	**-**	**-**	**800**

4	I	23UT4/H4/F4	Language-IV	6	3	3	25	75	100
4	II	23UE4	English-IV	6	3	3	25	75	100
4	III	23UND4CC7	PrinciplesofHuman Nutrition	4	4	3	25	75	100
4	III	23UND4CC8P	FoodanalysisandQualitycontrol-Practical	3	3	3	40	60	100
4	III	23UND4AC4	GeneralHomescience-II	4	4	3	25	75	100
4	III	23UND4AP2	GeneralHomescience–Practical	3	3	3	40	60	100
4	IV	23UND4SE6	Softskilldevelopment	2	2	3	25	75	100
	IV	23UES	Environmentalstudies	2	2	-	25	75	100
			ValueAdded Course*		2*	2	50	50	100*
			Total	**30**	**24**	**-**	**-**	**-**	**700**
5	III	23UND5CC9	NutritioninLifeCycle	5	5	3	25	75	100
5	III	23UND5CC10	AdvancedDietetics	5	5	3	25	75	100
5	III	23UND5CC11P	Nutritioninlifecycle–Practical	5	4	3	40	60	100
5	III	23UND5CC12PW	Projectwithviva-voce	5	4	3	80	20	100
5	III	23UND5DE1	Publichealth nutrition	4	4	3	25	75	100
5	IV	23UND5DE2	BasicinResearchmethodology	4	4	3	25	75	100
5	IV	23UVE	ValueEducation	2	2	3	25	75	100
5	IV		Internship/Industrialvisit/Fieldvisit	-	2*	-	-	-	-
			ValueAdded Course*		2*				100*
			Total	**30**	**28**	**-**	**-**	**-**	**700**
6	III	23UND6CC13	Quantityfoodservice&physical Facilities	6	5	3	25	75	100
6	III	23UND6CC14	Food Microbiology	6	5	3	25	75	100
6	III	23UND6CC15P	Dietetics–Practical	6	5	3	40	60	100
6	III	23UND6DE3	Dietcounseling	6	4	3	25	75	100
6	III	23UND6DE4	Nutritionforsportsand fitness	6	4	3	25	75	100
6	V		Extensionactivity	-	1	-	-	-	-
			ValueAdded Course*		2*				100*
			Total	**30**	**24**	**-**	**-**	**-**	**500**
			GrandTotal	**180**	**140**				**4200**

CORECOURSE

1. Food Science
2. FoodScience Practical
3. Human Physiology
4. HumanPhysiologyPractical
5. NutritionalBiochemistry
6. NutritionalBiochemistryPractical
7. PrinciplesofHumanNutrition
8. FoodAnalysisandQualityControl Practical
9. NutritionintheLifeCycle
10. Advanced Dietetics
11. NutritionintheLifeCyclePractical
12. ProjectwithViva-Voce(GroupProject)
13. QuantityFoodServiceandPhysical Facilities
14. Food Microbiology
15. DieteticsPractical

AILLEDCOURSE

1. GeneralBiochemistry
2. Food Chemistry
3. GeneralHomeScience–I
4. GeneralHomeScience–II
5. ClinicalBiochemistry&FoodChemistry
6. GeneralHomeScienceI&II

SKILLENHANCEMENTCOURSE

1. WomenandHealth(NME)
2. FunctionalFoodsandNutraceuticals
3. EntrepreneurshipDevelopment
4. BakeryScience
5. FoodPreservationand Processing
6. SoftSkillDevelopment

DISCIPLINE-SPECIFICELECTIVECOURSE

1. PublicHealthNutrition
2. BasicsinResearch Methodology
3. DietCounseling
4. NutritionforSports& Fitness

Note
InternalMarks/ExternalMarks

1. Theory–25(Internal),75(External)
2. Practical–40(Internal),60(External)
3. SeparatepassingminimumisprescribedforInternalandExternalmarks.

For Theory

- ThepassingminimumforCIAshallbe **40%outof25marks**(i.e.,**10 marks**).
- ThepassingminimumforUniversityExaminationsshallbe**40%outof75marks**(i.e.,**30marks**).

For Practical

- ThepassingminimumforCIAshallbe **40%outof40marks**(i.e.,**16 marks**).
- ThepassingminimumforUniversityExaminationsshallbe**40%outof60marks**(i.e.,**24marks**).

SEMESTER – I

FOODSCIENCE

CourseCode:23UND1CC1 **Max Marks 100**
Hours/Week:5 **InternalMarks :25**
Credits :5 **ExternalMarks :75**

CourseOutcomes

CO1: Identifynutrient-specificneedsandapplyfoodprinciplestosolvepracticalproblems.
CO2: Understandfoodgroups,theirfunctions,andmethodsofcookingtoenhancefoodpreparation.
CO3: Combinefoodstodevelopinnovativefoodproducts.
CO4: Detectandcontrolfoodadulterationwhileevaluatingfoodquality.
CO5: Usetechnologyandevidence-basedguidelinestoleadinhealth,diet,and nutrition.

UnitI

Food–Definition,functionsoffood,functionalclassification,foodgroups(4,5,7and11groups),food pyramid. Cooking – Definition and objectives; methods of cooking: moist heat, dry heat, combination methods, and microwave cooking (advantages and disadvantages); solar cooking (advantages and disadvantages). Effects of cooking on nutrients – Effect on carbohydrates, proteins, fats, vitamins, and minerals.

UnitII

CerealsandMillets–Structure,composition,andnutritivevalueofrice,wheat,andoats;nutritivevalue of maize, jowar, ragi, and bajra. Cereal Cookery – Effect of moist heat (hydrolysis, gelatinization and factors affecting gelatinization, gel formation, retrogradation, syneresis); effect of dry heat; role of cereals in cookery. Pulses – Composition, nutritive value, toxic constituents; pulse cookery (effect of cooking, factors affecting cooking quality); role of pulses in cookery; germination and its advantages.

UnitIII

Milk and Milk Products – Composition and nutritive value of milk; milk cookery (effect of heat, acid, and enzymes); types of milk products (fermented and non-fermented); role of milk in cookery. Eggs – Structure,composition,nutritivevalue;eggcookery(effectofheat,factorsaffectingcoagulationofegg proteins, effect of other ingredients on egg protein); role of eggs in cookery; home-scale methods for detecting egg quality. Meat – Classification, composition, nutritive value, rigor mortis, ageing, tenderizing;meatcookeryandchangesduringcooking.Poultry–Classification,composition,nutritive value. Fish – Classification, composition, nutritive value; selection and principles of fish cookery.

UnitIV

Vegetables – Classification (nutritional), composition, nutritive value; pigments in vegetables (water-solubleandwater-insoluble);enzymes,flavourcompounds,and bitter compounds. Vegetable Cookery – Preliminary preparation, changes during cooking, nutrient loss during cooking, effect of cooking on pigments, role of vegetables in cookery. Fruits – Classification, composition, nutritive value, ripening; browning (types and preventive measures). Spices – General functions, role in cookery, and medicinal value of commonly used spices.

UnitV

FatsandOils–Compositionandnutritivevalue;basicknowledgeofcommonlyusedfatsandoils(lard, butter,margarine,cottonseedoil,groundnutoil,coconutoil,soybeanoil,oliveoil,ricebranoil,sesame oil, rapeseed oil, mustard oil, palm oil); spoilage of fats (types and prevention); effect of heating; role of fats and oils in cookery Sugar and Related Products – Nutritive value, characteristics, and uses of various types of sugar; sugar cookery (crystallization and factors affecting crystallization; stages of sugar cookery); role of sugar in cookery.

References

1. Maney,S.(2008).*Foods,FactsandPrinciples*(3rded.).WileyEastern,New Delhi.
2. UshaChandrasekhar(2002).*FoodScienceandApplicationinIndianCookery*.PhoenixPublishingHouse Pvt. Ltd., New Delhi.
3. Raina,U.,Kashyap,S.,Narula,V.,Thomas,S.Suvira,Vir,S.,&Chopra,S.(2010).*BasicFood Preparation: A Complete Manual* (4th ed.). Orient BlackSwan Ltd., Mumbai.
4. Srilakshmi,B.(2017).*NutritionScience*.NewAgeInternational(P)Ltd.,NewDelhi.
5. Mahtab,S.Bamji,KamalaKrishnasamy,&Brahmam,G.N.V.(2012).*TextbookofHumanNutrition*(3rd ed.). Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
6. SunetraRoday(2017).*FoodScienceandNutrition*.OxfordUniversityPress,NewDelhi.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓			✓	✓	✓	✓
CO5	✓		✓	✓	✓		✓	✓	✓	✓
NumberofMatches(✓)=43 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–I

COREPRACTICAL– I–FOODSCIENCEPRACTICAL

CourseCode:23UND1CC2P **MaxMarks :100**
Hours/Week:3 **InternalMarks :40**
Credits :3 **ExternalMarks :60**

Course Outcomes

CO1: Demonstrateskillsindeterminingedibleportionsandunderstandingcookingeffectsonvolume and weight.
CO2: Selectsuitablecookingmethodstopreservenutrients.
CO3: Gainhands-onskillsinvariouscookingmethods.
CO4: Understandthebasicsofexperimental cooking.
CO5: Create recipesusingknowledgeofcookingmethodsandfoodproperties.

PracticalContent

IntroductiontoLaboratory

GroupingoffoodsaccordingtoICMRclassification.Measurementoffoodmaterials using standard measuring cups, spoons, and weighing scales.

Cereals

Observethemicroscopicstructureofdifferentstarches(rice,wheat,corn)beforeand aftergelatinization.Preparerecipesusingthefollowingprocesses:gelatinizationand gluten formation. Demonstrate the best method of cooking rice.

Pulses

Demonstratetheeffectofsoaking,hardwater,sodiumbicarbonate,andpapayaonthe cooking quality of pulses. Prepare recipes using whole gram, dhal, pulse flours, sprouted pulses, and cereal–pulse combinations.

Milk

Demonstratethefactorsaffectingthecoagulationofmilkprotein.Preparerecipes using milk and its products.

Egg

Demonstratetheeffectofaddingacid,fat,salt,water,andsugaronthetextureof omelettes. Prepare recipes where the egg acts as:

- Thickening agent
- Binding agent
- Emulsifying agent
- Enrichingagent

Vegetables& Fruits

Demonstrate the effect of acid, alkali, and overcooking on vegetables containing differentpigments.Preparethefollowingusingfruitsandvegetables:salads,soups, curries, and juices.

Fats&Oils

Determinethesmokingpointofanyfourcookingoils.Preparerecipesusingshallow- fat and deep-fat frying methods.

Sugar

Preparerecipesusingvariousstagesofsugarcookeryandjaggery.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓		✓	✓		✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO5	✓		✓	✓	✓		✓	✓	✓	✓
NumberofMatches(✓)=42 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER – I

GENERALBIOCHEMISTRY

CourseCode: 23UND1AC1 **Max Marks :100**
Hours/Week:5 **InternalMarks :25**
Credits :4 **ExternalMarks : 75**

CourseOutcomes

CO1: Developastrongunderstandingofvariousbiomolecules.
CO2: Preparebuffersandstudythestructureandfunctionofbiomolecules.
CO3: Gainknowledgeofvitaminsandtheirclassification.
CO4: Acquireknowledgeaboutdiagnosticandclinicaltesting.
CO5: Attainbroadknowledgeaboutthefundamentalconceptsofbiochemistry.

Unit I–Carbohydrates

- Definition,sources,andclassification
- Structureofglucose
- Biologicalsignificance
- Digestionandabsorption

UnitII–Proteins

- Definition,sources,andclassification
- Structureofproteins(primary,secondary,tertiary)
- Aminoacids –structure,classification(essentialandnon-essential),proteinandnon-proteinamino acids

UnitIII–Lipids

- Definition,sources,classification,structure,properties,andfunctions
- Fattyacids–saturated,unsaturated,andessentialfattyacids

UnitIV–NucleicAcids

- Definition,structure,forms,andfunctionsofDNA
- Types,structure,andfunctionsofRNA(mRNA,tRNA,rRNA)

UnitV –Vitamins

- Definition,sources,deficiencysyndromes,andfunctions of:
- Fat-solublevitamins(A,D,E,andK)
- Water-solublevitamins(B-complexandC)

References

1. Deb,A.C.(2011).*FundamentalsofBiochemistry*(10thed.).NewCentralBookAgency(P)Ltd., London.
2. AmbikaShanmugam(2011).*FundamentalsofBiochemistryforMedicalStudents*.Nagarajand Company Pvt. Ltd., India.
3. CharlotteW.Pratt&KathleenCornely(2013).*EssentialBiochemistry*(3rded.).Wiley Publishers.
4. Sathyanarayana,U.&Chakrapani,U.(2013).*Biochemistry*(4thed.).Elsevier Publishers.
5. Rafi,M.D.(2014).*TextbookofBiochemistryforMedicalStudents*(2nded.).UniversitiesPress (India) Pvt. Ltd., Hyderabad.
6. Byju's:Nucleic Acids

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓		✓	✓	✓		✓
CO4	✓	✓		✓		✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓		✓
NumberofMatches(✓)=44 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER – II

HUMANPHYSIOLOGY

CourseCode: 23UND2CC3 **MaxMarks 100**
Hours/Week:5 **InternalMarks 25**
Credits :5 **External Marks 75**

CourseOutcome

CO1: Correlatetheimportanceofvarioushormonesinthebodyandtheeffectsoftheirimbalance.
CO2: Developcompetencyinanalyzingtherelationshipbetweenhealth,disease,andphysiology.
CO3: Gainbasicknowledgeofhumananatomyandphysiologyanddefinethemainstructurescomposing the human body.
CO4: Explainthestructureandfunctionsofcells,tissues,organs,andsystemsofthehumanbody.
CO5: Bewellpreparedforcareersinhealthprofessionsand/orbiomedicalresearch.

UnitI–BloodandCirculatorySystem

- Blood–Compositionandfunctions
- WhiteBloodCells–Typesand functions
- RedBloodCells–Structureandfunctions
- Haemoglobin–StructureandfunctionsErythropoiesisBloodcoagulation
- Reticulo-EndothelialSystem–Definitionandfunctions
- Bloodgroups–ABO,Rh
- LymphaticSystem
- HeartandCirculation–Structureofheartandbloodvessels,propertiesofcardiacmuscle,cardiac cycle, origin and conduction of heart beat, measurement of arterial blood pressure

UnitII–Digestive System

- Generalanatomy
- Digestioninthemouth,stomach,andintestines
- Movementsoftheintestine
- Roleofliverandpancreas–structureandfunctions

UnitIII–RespiratoryandExcretorySystem

- RespiratorySystem–Structureofrespiratoryorgans,subdivisionsoflungair,chemistryof respiration
- ExcretorySystem –Physiologyoftheurinarysystem,structureofkidneyandnephron,formationof urine, micturition
- Skin–Structureandfunctions,regulationofbodytemperature

UnitIV–EndocrineandReproductiveSystem

- EndocrineSystem–Structureandfunctionsofthyroid,pituitary,parathyroid,adrenals,isletsof Langerhans of pancreas
- ReproductiveSystem–Anatomyofmaleandfemalereproductiveorgans,menstrualcycle, mammary glands, fertilization, development of embryo, pregnancy and parturition

UnitV–NervousSystemandSense Organs

- NervousSystem –Generalclassificationofnervoussystem,structureofnervecellandspinalcord, basic knowledge of different parts of the brain (anatomy and functions of cerebrum, cerebellum, medulla oblongata)
- SenseOrgans–Structureandfunctionofeyeandear,physiologyoftaste,smell,andcutaneous sensations

References

1. Chatterjee,C.C.(2004).*HumanPhysiology*(Vol.I).MedicalAlliedAgency,Kolkata.
2. Chatterjee,C.C.(2004).*HumanPhysiology*(Vol.II).MedicalAlliedAgency,Kolkata.
3. Sembulingam,K.(2000).*EssentialsofMedicalPhysiology*.JaypeeBrothersMedicalPublishers (P)Ltd.,New Delhi.
4. Best&Taylor(1992).*ThePhysiologicalBasisforMedicalPractice*.SaundersCompany.
5. Chaudhri,K.(1993).*ConciseMedicalPhysiology*.NewCentralBookAgency(P)Ltd.,Calcutta.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO2	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO4	✓	✓		✓	✓		✓	✓		✓
CO5	✓		✓	✓	✓	✓	✓	✓	✓	✓
NumberofMatches(✓)=43 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–II

HUMANPHYSIOLOGYPRACTICAL-II

CourseCode:23UND2CC4P **MaxMarks :100**
Hours/Week:3 **InternalMarks :40**
Credits 3 **External Marks :60**

CourseOutcomes

CO1: Understand the structure of vital organs, glands, and tissues under a microscope.
CO2: Learntomeasurebloodparameterslikehemoglobin,bloodgroup,bleedingtime, clotting time, and platelet count.
CO3: Usemedicalinstrumentslikestethoscopesandsphygmomanometers effectively.
CO4: Determinethehemoglobin levelsin blood samples.
CO5: Analyzeandcomparethe functionsofdifferent organs.

PracticalExercises

- Histologyoftissues–Columnar,cuboidal,ciliated,squamous,stratifiedsquamous
- Microscopicstructureoforgans–lungs,artery,vein,stomach,ovary,testis,uterus, pancreas
- Histologyofmuscles–cardiac,striated,non-striated
- Estimationofhemoglobin,bleedingtime,andclottingtime
- Measurementofblood pressure–beforeandafterexercise
- Determinationofrespiratoryrate andpulserate–beforeandafterexercise
- Determinationofbloodgroup
- DeterminationofRhfactor
- Enumerationofredbloodcells – Demonstration
- Enumerationofwhiteblood cells – Demonstration
- Differentialleucocytecount–Demonstration

Reference

1. Wright,S.*Applied Physiology*.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓		✓		✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO5	✓		✓	✓			✓	✓	✓	✓
NumberofMatches(✓)=41 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER – II

FOODCHEMISTRY

CourseCode:23UND2AC2 **MaxMarks :100**
Hours/Week:3 **InternalMarks :25**
Credits :3 **ExternalMarks: 75**

CourseOutcomes

CO1: Understandthenutrientspresentinfood.
CO2: Explorethechemistryoffood.
CO3: Learnthesciencebehindfood preparation.
CO4: Gainknowledgeaboutbeverages,includingsoftdrinks,juices,andalcohol.
CO5: Studythephysicalandchemicalchangesinfoodduringcooking.

UNIT–I:PHYSICO-CHEMICALPROPERTIESOFFOODS

- Moistureinfoods,hydrogenbonding,boundwater,wateractivityinfoods
- Determinationofmoisturecontentinfoods
- Truesolutions,dispersions,sols,gels,foams,colloidsandemulsions

UNIT–II:CHEMISTRYOFSTARCHAND SUGARS

- Componentsofstarch,swellingofstarchgranules,gelformation,retrogradation,syneresis
- Effectofsugar,acid,alkali,fatandsurfaceactiveagentsonstarch
- Stagesofsugarcookery,crystalformationandfactorsaffecting it
- Typesofcandies,actionofacid,alkaliandenzymes
- Chemistryofmilksugar,non-enzymaticbrowning

UNIT–III:CHEMISTRYOF PROTEINS

- Componentsofwheatproteins,structure,glutenformation
- Effectofsoaking,fermentationandgerminationonpulseproteins
- Propertiesofeggprotein,chemistryofmilkprotein,changesinmilk,eggandmeat proteins during heating
- Actionofheat,acid,alkalisonvegetableproteinsandanimalproteins

UNIT–IV:CHEMISTRYOFFATSANDOILS

- Classificationandcharacteristicsoflipids
- Physicalproperties –meltingpoint,softeningpoint,specificgravity,refractiveindex,smoke point, flash and fire point, turbidity point
- Chemicalproperties–Reichert-Meisselvalue,Polenskevalue,iodinevalue,peroxidevalue, saponification value
- Effectoffryingonfats,changesinfatsandoils–rancidity,lipolysis,flavorreversion
- Technologyofediblefatsandoils–refining,winterization,plasticity,hydrogenationand interesterification
- Shorteningpoweroffats,changesinfatsandoilsduring heating
- Factorsaffectingfatabsorptioninfoods

UNIT–V:CHEMISTRYOFPECTICSUBSTANCES,PLANTPIGMENTS,SPICESANDCONDIMENTS

- Pectins,phenoliccomponents,enzymaticbrowninginfruitsandvegetables
- Volatilecompoundsfromcookedvegetables
- Differenttypesofplantpigments–waterandfatsolublepigments
- Propertiesandactiveprinciplesofspicesandcondiments

References

- ShakuntalaManay,Shadaksharaswamy,M.(2000). *Foods:FactsandPrinciples*.2ndEdition. New Age International Pvt. Ltd. Publishers.
- Chandrasekhar,U.(2002).*FoodScienceandApplicationsinIndianCookery*.PhoenixPublishing House, New Delhi.
- Swaminathan,M.(2005).*FoodScience,ChemistryandExperimentalFoods*.BappcoPublishers, Bangalore.
- Meyer,L.H.(2004).*FoodChemistry*.4thEdition.CBSPublishersandDistributors.
- Paul,P.C.&Palmer,H.H.(2000).*FoodTheoryandApplications*.RevisedEdition.JohnWiley and Sons, New York.
- Chopra,H.K.&Panesar,P.S.(2010).*FoodChemistry*.NarosaPublishingHouse,NewDelhi.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓			✓		✓	✓
CO5	✓		✓	✓	✓		✓	✓	✓	✓
NumberofMatches(✓)=42 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–II

FOODCHEMISTRY(PRACTICAL)

CourseCode:23UND2AP1 **MaxMarks :100**
Hours/Week:3 **InternalMarks :40**
Credits :2 **External Marks:60**

CourseOutcomes

CO1: Understandthechemicalfunctionsandpropertiesoffood.
CO2: Learnaboutthechemicalinteractionsbetweenfoodcomponents.
CO3: Exploresensoryqualities,nutritionalvalue,functionalproperties,andfoodsafety.
CO4: Gainknowledgeofbiochemicalandenzymatictechniquesforfoodanalysis.
CO5: Understandchemicalreactionsthataffectfoodqualityintheindustry.

Listof Experiments

QualitativeAnalysis–GeneralBiochemistry

- Qualitativeanalysisofcarbohydrates
- Qualitativeanalysisofproteins
- Qualitativeanalysisoflipids
- EstimationofproteinbyLowry's method
- Estimationofamino acids
- Determinationofreducingsugaringrapes
- Estimationofphenoliccompoundsinfoodsamples
- Demonstrationofpaperandthinlayerchromatography

Food Chemistry

- Demonstrationofretrogradationand syneresis
- Factorsaffectingabsorptionoffat
- Changesobservedincookingmeatand poultry,andtestingthetendernessof meat
- Coagulationofeggwhite andegg yolk
- Formationofferroussulphideinboiledeggsandpreventive measures
- Changesin pHduring cookingof vegetables
- Effectof cookingtimeon eggs
- Effectofacid andalkali onwater-solublepigments

References

1. KeithWilson&JohnWalker(1995).*PrinciplesandTechniquesofPractical Biochemistry* (4th Edition). Cambridge University Press, Britain.
2. OserB.L.&Hawks.*PhysiologicalChemistry*.TataMcGrawHill,1965.
3. StrolvB.A.&MakavoraV.C.(1989).*LaboratoryManualinBiochemistry*.MIR Publishers, Moscow.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓		✓	✓		✓	✓		✓	✓
CO3	✓	✓		✓	✓	✓	✓			✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO5	✓		✓	✓	✓		✓		✓	✓
NumberofMatches(✓)=37Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER – II

ENTREPRENEURSHIPDEVELOPMENT

CourseCode:23UND2SE3 **MaxMarks 100**
Hours/Week:2 **InternalMarks 25**
Credits :2 **ExternalMarks 75**

CourseOutcomes

- **CO1:**Learnthebasicsof entrepreneurship.
- **CO2:**Explorehowtoapproachsupport institutionsandbanksforstartingabusiness.
- **CO3:**Understandproductselectionandtypesof ownership.
- **CO4:**Developprojectproposalsandpracticeaccounting methods.
- **CO5:**Learntheskillsneededtobecomean entrepreneur.

UnitI–Entrepreneur

- Entrepreneur:Definition,qualitiesand essentialskillsofan entrepreneur
- Communicationandpresentation skills
- Innovativenessandidea generation
- SWOT analysis
- Stepstostartasmall enterprise
- Learningjourneyofasuccessful entrepreneur

UnitII–BusinessPlan

- Businessplanforsmallenterprises:Importance,purpose,contentsand benefits
- Businessplancreationprocessandpreparationofasamplebusinessplan
- Businessethicsandetiquettes

UnitIII–MarketSurvey

- Marketsurvey:Meaning,processofconductingamarketsurvey
- Pointstobeconsideredforeffectivemarketresearch
- Stepstoregisteracompany
- Regulatory requirements

UnitIV–ManagementProcessand Policies

- Importanceofpolicycreationandcorporategovernance
- Managementprocessand functions
- Productionandoperation management
- Marketingmanagement
- Financialmanagement
- Humanresource management
- Pricingpolicyandmethodsof pricing

UnitV–FinancialNeeds

- Typesoffinancialneeds: Fixedandworkingcapital
- Methodsofraising capital
- Workingcapital management
- Workingcapitalcycle

References

1. *EntrepreneurshipDevelopment–YourGatewaytotheJourneyofEntrepreneurship*,ICT Academy of Tamil Nadu, Chennai, 2015.
2. Khanka,S.S.(2007).*Entrepreneurial Development*.S.ChandPublications.
3. VasantDesai(2009). *Entrepreneurial Development*,Vol.1, HimalayaPublishing House.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓		✓	✓	✓	✓			✓	✓
CO3	✓	✓	✓		✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	
CO5	✓		✓		✓		✓	✓	✓	✓
NumberofMatches(✓)=38 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER – III

NUTRITIONALBIOCHEMISTRY

CourseCode:23UND3CC5 **MaxMarks :100**
Hours/Week:4 **InternalMarks:40**
Credits :4 **ExternalMarks:60**

CourseOutcomes

CO1: UnderstandthesignificanceofDNA andexplainitsreplication process.
CO2: Understandthebasicconceptsofimmunology.
CO3: Identifytypesof DNAmutationsandsummarizeDNArepairmechanisms.
CO4: Explaintheroleofplasmidsand phagesin genetics.
CO5: Analyzemethodsofgenetransferandrecombination.

UnitI–Biochemistry

- Definition,objectives,scopeandinterrelationshipbetweenbiochemistryandother biological sciences
- Enzymes:Definition,types,classification,specificity,isozymes,coenzymes
- Factorsaffectingenzymeaction,enzyme inhibition
- Definitionsofglycolysis,glycogenesis,glycogenolysisandgluconeogenesis

UnitII–Protein

- Protein:Definition,classification,structure,physicalandchemicalproperties,utilization
- Aminoacids:Types,definition,deamination,transaminationanddecarboxylation

UnitIII– Lipids

- Lipids:Definition,classificationandproperties
- Metabolism:Beta-oxidationandbiosynthesisoffattyacids
- Cholesterolmetabolism
- Definitions:Ketonebodies,ketogenesisand ketosis

UnitIV–Genetic Control

- Introductiontogeneticcontrolofmetabolism
- Nucleicacids:Structure, replication
- Elementaryknowledgeofbiosynthesisof proteins
- Types,compositionandinformational molecules
- Purines,pyrimidines,nucleosides,nucleotides
- StructureandfunctionsofDNAandRNA
- Mechanismofproteinsynthesis

UnitV–Acid-Base Balance

- Acid-basebalanceinnormal health
- Definitionandprinciplesof buffers
- Majorsourcesofacidsproducedinthebody
- Physiologicalbuffersystemsandtheirroles
- Fluidandelectrolytebalance:Maintenanceinnormal health

References

1. Malacinski,G.M.(2008).*Freifelder'sEssentialsofMolecularBiology*(4thEdition). Narosa Publishing House, New Delhi.
2. Gardner,E.J.,Simmons,M.J.&Snustad,D.P.(2006).*PrinciplesofGenetics*(8th Edition). Wiley India Pvt. Ltd.
3. Trun,N.&Trempy,J.(2009).*FundamentalBacterialGenetics*(1stEdition).Blackwell Science Ltd.
4. Brown,T.A.(2016).*GeneCloningandDNAAnalysis–AnIntroduction*(7thEdition). John Wiley and Sons Ltd.
5. Dale,J.W.,Schantz,M.V.&Plant,N.(2012).*FromGenetoGenomes–Conceptsand Applications of DNA Technology* (3rd Edition). John Wiley and Sons Ltd.
6. Glick,B.R.&Patten,C.L.(2018).*MolecularBiotechnology–Principlesand Applications of Recombinant DNA* (5th Edition). ASM Press.
7. Russell,P.J.(2010).*iGenetics–AMolecularApproach*(3rdEdition).PearsonNew International Edition.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓	✓		✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓		✓	✓	✓		✓
CO4	✓	✓	✓		✓		✓		✓	✓
CO5	✓		✓	✓	✓		✓	✓	✓	
NumberofMatches(✓)=39 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER – III

NUTRITIONALBIOCHEMISTRYPRACTICAL

CourseCode:23UND3CC6P **MaxMarks :100**
Hours/Week:3 **InternalMarks:40**
Credits :3 **ExternalMarks:60**

CourseOutcomes

CO1: Identifypreservativesandadditivesinfood labels.
CO2: Detect food adulterants using simple methods.
CO3: Assessfoodqualitythroughsensoryevaluation.
CO4: Test for sugar and protein in urine.
CO5: Measurecholesterollevelsin blood.

PracticalExercises

- Quantitativeestimationofglucosein urine
- Quantitativeestimationofureainurine
- Quantitativeestimationofblood glucose
- Quantitativeestimationofblood urea
- Quantitativeestimationofserumcholesterol
- Quantitativeestimationofiron–titration method
- Quantitativeestimationofcalcium–titrationmethod

References

1. Glick,B.R.&Patten,C.L.(2018).*MolecularBiotechnology–Principlesand Applications of Recombinant DNA* (5th Edition). ASM Press.
2. Russell,P.J.(2010).*iGenetics–AMolecularApproach*(3rdEdition).PearsonNew International Edition.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓	✓		✓	✓	✓	✓	✓		✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓	✓		✓	✓		✓
CO5	✓		✓		✓		✓	✓	✓	✓
NumberofMatches(✓)=39 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–III

GENERALHOMESCIENCE-I

CourseCode:23UND3AC3
Hours/ Week : 4
Credits 4

Max Marks :100
Internal Marks :25
ExternalMarks :75

CourseOutcomes

CO1: Understandthebasicsandconceptsoftextiles.
CO2: Learnkeytextileterms.
CO3: Graspthebasic principlesofclothing construction.
CO4: Explorethe conceptand scopeoffamilyresourcemanagement.
CO5: Apply knowledge of siteselection andbuilding principlesin real-lifesituations.

UnitI–Textile

- Textile:Definition,terminologyandclassificationoftextilefibers
- Basicunitsandpolymer bondsintextilefibers
- Physicalandchemicalpropertiesoffibers
- Processingandmanufactureofallnaturalandman-madefibers–plant,protein,man- made, cellulosic, synthetic, metallic, mineral, and elastomeric fibers

UnitII– Clothing

- Clothing:Originandprinciplesofclothing
- Clothingconstruction –Draftingflatpatternsanddraping
- Textiledesigning,fashiondesigning–influencingfactors,fashioncycle,brokenfashion cycles, fashion adoption theories
- Businessandmerchandising

UnitIII–HomeManagement

- Homemanagement:Definition,characteristics,andimportance
- Motivationfactorsofmanagement –values,goals,standards
- Homemanagementprocess

UnitIV–FamilyResourceManagement

- Familyresourcemanagement:Typesandcharacteristicsoffamilyresources
- Familydecisionmaking–definitionandtypesof decisionmaking
- Housing:Definition,importanceandfunctionsofa house
- Principlesofplanning,spaceallocationandorganizationinindependenthouses, apartments, and flats
- Symbolsusedindraftingplans,readingplans,andblueprints

UnitV–InteriorDesign

- Interiordesign: Definition,principles,andclassification
- Householdequipmentandcolors–definition,classification,factorsinfluencingchoiceof colors
- Furnitureandlighting–definitionand types

References

1. SunitaMishra(2018).*Textiles,ClothingandHomeManagement*.SelectiveandScientific Books, New Delhi.
2. Bhargava,B.(2001).*FamilyResourceManagementandInteriorDecoration*.Delhi: University Book House.
3. Bhargava,B.(2001). *Housingand SpaceManagement*. Jaipur:UniversityBookHouseLtd.
4. Seetharaman,P.,Batra,S.,&Mehra,P.(2005).*AnIntroductiontoFamilyResource Management*. New Delhi: CBS Publishers & Distributors. ISBN: 9788123911861
5. Shukul,M.,&Gandotra,V.(2006).*HomeManagementandFamilyFinance*.NewDelhi: Dominant Publishers and Distributors. ISBN: 81-7888-403-8.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓		✓		✓	✓		✓	✓
CO2	✓	✓	✓			✓	✓		✓	
CO3	✓	✓		✓		✓	✓	✓		✓
CO4	✓	✓	✓		✓	✓		✓	✓	✓
CO5	✓		✓		✓	✓	✓	✓		✓
Numberof Matches(✓)=35Relationship:Moderate										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–III

BAKERYSCIENCE

CourseCode:23UND3SE4 **MaxMarks 100**
Hours/Week:2 **InternalMarks :40**
Credits :2 **ExternalMarks :60**

CourseOutcomes

CO1: Adjustrecipesforproductionandequipmentneeds.
CO2: Prepareyeast-basedproductsthroughscaling,mixing,molding,proofing,andbaking.
CO3: Makecookiesusingdifferentdividingandpanningmethods.
CO4: Createfinisheslikewashes,glazes,icings,andfillingsforproducts.
CO5: Learntosetupabakeryanddevelopentrepreneurialskillsinbakeryand confectionery.

Unit I–Baking

- Baking:Meaning,process,andscientificprinciplesinvolved
- Basicplanandlayout ofabakery unit
- Equipmentusedinbakery:Largeequipment,smallequipment,andtools
- Typesofovens
- Ingredientsusedinbakery:Functionalclassification–structurebuilders,tenderizers,moisteners, driers, and flavors

UnitII–FlourandIngredients

- Flour:Composition,types,andqualitycharacteristics
- Sugar:Sources,uses,andtypesofcommerciallyavailablesugars
- Fatsusedasshortenings:Butter,margarine,emulsifiedfats,andflavored oils
- Propertiesandusesof shortenings

UnitIII–LeaveningAgents

- Leaveningagents:Definitionandclassification–physical,chemical(bakingpowder,baking soda), biological (yeast types and role in baking)
- Moisturizingagents:Egg,water,andmilk –theirrolein baking

UnitIV–BreadandCakes

- Bread:Ingredientsused,stepsinbread-makingprocess,processingmethods
- Characteristicsofgoodbread:Externalandinternal
- Commonfaultsinshape,texture,crust,andflavorofbread
- Cakes:Ingredients,types,cake-makingmethods,testfordoneness
- Characteristicsofgoodcake:Externalandinternal
- Cakefaultsand remedies
- Icing:Meaning,types,ingredientsused,andpreparationguidelines

UnitV–Cookies,Biscuits,andPastries

- Cookies:Characteristics,preparationmethods,andproblemsincookiemaking
- Biscuits:Stepsinvolvedinbiscuitmaking
- Pastries:Typesandmethodsofpreparation

References

1. NeelamKhetarpaul,RajBalaGrewal,&SudeshJood(2013). *BakeryScienceandCereal Technology*. Daya Publishing House.
2. JohnKingslee(2014).*AProfessionalTexttoBakeryandConfectionery*.NewAgeInternational (P) Limited.
3. NIIRBoardofConsultantsandEngineers(2009). *TheCompleteTechnologyBookonBakery Products* (2nd Edition). National Institute of Industrial Research, Delhi.
4. ShakuntalaManay&M.Shadaksharaswamy(2005).*FoodFactsandPrinciples*.NewAge International (P) Ltd Publishers.
5. VijayaKhader(2001).*TextbookofFoodScienceandTechnology*.IndianCouncilofAgricultural Research, New Delhi.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓		✓	✓	✓	✓	✓
CO3	✓	✓	✓		✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NumberofMatches(✓)=45 Relationship:VeryHigh										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER – IV

PRINCIPLESOFHUMANNUTRITION

CourseCode:23UND4CC7 **MaxMarks :100**
Hours/Week:4 **InternalMarks :25**
Credits :4 **ExternalMarks:75**

CourseOutcomes

CO1: Summarizeanddiscussbasicandappliednutritionconcepts.
CO2: Explain the functions of specific nutrients for health.
CO3: Identifynutrient-relatedfactorsandapplyfoodprinciples.
CO4: Understand the role of nutrients in community health.
CO5: Developskillsinanalyzingandestimatingnutrients.

Unit I–Nutrition

- ScienceofNutrition,ConceptofNutrition
- Definitions:Nutrition,Health,NutritionalStatus,Malnutrition
- RecommendedDietaryAllowances(RDA):Definition,factorsaffectingRDA,methodsusedfor deriving RDA
- Carbohydrates:Definition,composition,functions,maintenanceofbloodsugarlevels, requirements, sources, digestion, and absorption
- DietaryFiber:Definition,classification,physiologicaleffects,andsources

UnitII–Proteinsand Lipids

- Proteins:Definition,composition,nutritionalclassificationofproteinsandaminoacids, functions, sources, requirements, digestion, and absorption
- EvaluationofProteinQuality:PER,BV,NPU,andChemicalScore
- Lipids:Definition,composition,functions,sources,requirements,digestion,andabsorption
- EssentialFattyAcids:Definition,functions,sources,andeffectsofdeficiency

UnitIII–Energy

- Energy:Definition,unitsofmeasurement,directandindirectcalorimetry
- Determinationofenergyvalueoffood
- Totalenergyrequirement
- Factorsaffectingphysicalactivity
- FactorsaffectingBasalMetabolic Rate
- FactorsaffectingThermicEffectofFood
- RecommendedDietaryAllowancesandsourcesofenergy

UnitIV–Minerals

- **MacroMinerals:**CalciumandPhosphorus–Functions,requirements,sources,andeffectsof deficiency
- **MicroMinerals:**Iron,Iodine,Copper,Fluorine,andZinc–Functions,sources,requirements, and effects of deficiency
- SodiumandPotassium:Functions,sources,requirements,andeffectsofimbalances

UnitV –Vitamins

- **Fat-SolubleVitamins:** VitaminA,D,E,andK–Functions,requirements,sources,andeffects of deficiency
- **Water-SolubleVitamins:**Thiamine,Riboflavin,Niacin,AscorbicAcid,FolicAcid,Vitamin B6, and Vitamin B12 – Functions, requirements, sources, and effects of deficiency

References

1. SumathiR.Mudambi&M.V.Rajagopal(1997). *FundamentalsofFoodsandNutrition*(3rdEdition). New Age International (P) Ltd, Publishers.
2. Srilakshmi,B.(2016).*NutritionScience*(5thMulticolourEdition).NewAgeInternational(P)Ltd, Publishers.
3. MangalaKango(2005).*NormalNutrition:CuringDiseasesthroughDiet*(1stEdition).CBS Publications.
4. SueRodwellWilliams(2000).*NutritionandDietTherapy*(6thEdition).C.V.MosbyCo.
5. MahtabS.Bamji,KamalaKrishnaswamy&G.N.V.Brahmam(2009). *TextbookofHumanNutrition*(3rd Edition). Oxford and IBH Publishing Company.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓		✓	✓	✓	✓	✓
CO3	✓	✓	✓		✓	✓	✓		✓	✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	
CO5	✓		✓	✓	✓	✓	✓	✓	✓	✓
NumberofMatches(✓)=43 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–IV

FOODANALYSIS ANDQUALITYCONTROL- PRACTICAL

CourseCode:23UND4CC8P **MaxMarks 100**
Hours/Week:3 **InternalMarks 40**
Credits :3 **ExternalMarks:60**

CourseOutcomes

CO1: Understanddifferentfoodsamplingtechniques.
CO2: Learnaboutfoodqualityattributesandtheinstrumentsusedforanalysis.
CO3: Understandmethodstodetectfoodadulteration.
CO4: Practicegoodlaboratorymethodsinfoodstandardization.
CO5: Gainknowledgeaboutqualityassurancein food.

PracticalExercises

1. Determinationofmoisture,ash,andfiberinfood.
2. Estimationofcalcium,phosphorus,iron,andascorbicacidinfood.
3. Estimationoftotalnitrogeninfood.
4. Estimationoftitratableacidity,pectincontentoffoods,andlactose.
5. Estimationofspecificgravityofmilkusingalactometer.
6. Determinationofglutencontent.
7. Determinationofsugarconcentrationoffoodproductsusinga refractometer.
8. Sensitivitytestsforthefourbasictastes.
9. IsolationofmicroorganismsbyPureCultureTechniqueandmicrobialcountbyStandardPlate Count Method.
10. Studyofmorphologyandstructuralfeaturesofvariousbacteriaandfungicommonlyassociated with foods.
11. Testsforidentificationofadulterantspresentincommonlyusedfoods.

Reference

1. Ranganna,S.(2001).*HandbookofAnalysisandQualityControlforFruitandVegetable Products* (2nd Edition). Tata McGraw-Hill, Government of India.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓		✓
CO4	✓	✓		✓	✓		✓	✓	✓	✓
CO5	✓		✓	✓	✓		✓	✓	✓	✓
NumberofMatches(✓)=41 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–IV

GENERALHOMESCIENCE-II

Course Code: 23UND4AC4 **Max Marks. :100**
Hours/ Week: 4 **Internal Marks.:25**
Credits :4 **ExternalMarks :75**

CourseOutcomes

CO1: Understandtheimportanceoffamilyincome,expenditure,and savingforthe future.
CO2: Recognizetherole of early childhooddevelopmentandinterventionprograms.
CO3: Learn aboutwomen'srightsandlawsrelatedtowomeninIndia.
CO4: Understandconsumerprotectionlaws andpersonalrightsandresponsibilities.
CO5: Learn aboutextensioneducation,itsapproaches,andmodels.

UNIT–I: FAMILY

- Meaningandcharacteristicsof family.
- Typesoffamilyandfamilylife cycle.
- Familywants,familyincome,familyexpenditure,andhouseholdaccounts.
- Familybudgetsandeconomics.
- Consumerprotection:Definition,importance,laws,consumereducation,and advertisements.

UNIT–II:CHILDDEVELOPMENT

- Principlesofdevelopmentandstagesofgrowth.
- Lifespandevelopment theories:
  - PsychodynamicTheory
  - Psycho-AnalyticTheory (Freud)
  - PsychosocialTheory (Erikson)
  - LearningTheory
  - SocialLearning Theory
  - CognitiveDevelopmentalTheory
  - Kohlberg'sMoralReasoningTheory
  - InformationProcessingTheory
  - Bronfenbrenner'sEcologicalSystemsTheory
  - LifeSpan andLifeCycleTheory

UNIT–III:CHILDANDHUMANDEVELOPMENT

- Earlychildhoodcareandeducation:Emergingtrends,issues,andconcerns.
- Developmentalproblems:Mentalsubnormality,mentalretardation,learningdisabilities, behavioral difficulties, speech and language disorders, hearing impairment, visual impairment, physical handicap, giftedness.
- Guidanceandcounselingforchildren.

UNIT–IV:WOMENSTUDIESANDDEVELOPMENT

- Principlesofearly childhoodcareanddevelopment.
- Socializationinvariousfamilycontextsacrossdifferent cultures.
- Processofsocialization:Socialandnon-socialbehaviors,difficultiesinconformingto social expectations, foundations of social behavior in babyhood, behavior patterns in early childhood.
- Womenstudies:Women'sequality,violenceagainst women,women'shealth,women empowerment,women andhuman rights.

UNIT–V:EXTENSIONEDUCATION

- Extensioneducation:Definition,non-formaleducation,andhistory.
- Concepts,philosophy,andprinciplesofextension education.
- Differencesbetweenformalandextensioneducation.
- Curriculumplanninganddevelopment:Objectives,planning,management,and administration of formal, non-formal, and extension education programs.
- Monitoring,supervision,andevaluationofformal,non-formal,andextension education.
- Majortypesoftestsandqualitiesofagood test.

References

1. Bhargava,B.(2005).*FamilyResourceManagementandInteriorDecoration*.Jaipur: Apple Printer & V.R. Printers.
2. Deacon,R.F.,&Firebaugh,F.M.(1975).*HomeManagement:ContextsandConcepts*. Boston: Houghton Mifflin Company.
3. Nisha,M.(2006).*UnderstandingExtensionEducation*.NewDelhi:KalpavPublications.
4. Reddy,A.A.(2001).*ExtensionEducation*.Bapatla:SriLakshmi Press.
5. Singh,U.K.,&Nayak,A.K.(2007).*ExtensionEducation*.NewDelhi:Commonwealth Publishers.
6. SunitaMishra(2018).*SelectiveandScientificBooks*.NewDelhi.

.

RelationshipMatrixforCOs,POs,andPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓			✓
CO3	✓	✓	✓	✓		✓	✓	✓	✓	
CO4	✓	✓	✓		✓		✓		✓	✓
CO5	✓	✓	✓		✓	✓	✓	✓	✓	✓
NumberofMatches(✓)=41 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–IV

GENERALHOMESCIENCE–II–PRACTICAL

Course Code:23UND4AP2 **Max Marks :100**
Hours/Week :3 **InternalMarks:40**
Credits :3 **ExternalMarks:60**

CourseOutcomes

CO1: Understandtheimportanceofearlychildhoodandinterventionprogramsfordevelopment.
CO2: Learnaboutwomen'shumanrightsandrelatedlawsinIndia.
CO3: Gainknowledgeofconsumerprotection.
CO4: Learnaboutextensioneducationconcepts,approaches,andmodels.
CO5: Planandorganizefamilyeducationprogramsonchilddevelopment.

PracticalExercises

1. Prepareafirstaidkit.
2. FinancialLiteracyandBudgeting:Prepareabudgetforlow,middle,andhigh-incomegroup families.
3. Learntofilldifferentbankforms:Withdrawanddepositmoney.
4. Openabankaccount:Recurringdepositaccount.
5. HousingandInteriorDesign: Drawhouseplansforlow,middle,andhigh-incomefamilies;draw kitchen layouts including plumbing and wiring.
6. ChildDevelopmentandMilestones:Prepareanalbumondevelopmentmilestonesofchildren.
7. Designgreetingcardsforfivedifferent occasions.
8. HomeDécorandTableSetting:Practicepropertablesettingtechniques.
9. Fruitandvegetablecarving.
10. Identifyvarioustypesoffibersusingburningtestsandvisualinspection.
11. Usewastematerialstomakedecorativeandutilityitems.
12. EnvironmentalAwarenessandHygiene:Prepareaposterorchartonenvironmental/personal hygiene and sanitation.
13. FoodLabelingandCookingSkills: Prepareandevaluateafoodlabelfordifferenttypesoffood products.
14. Methodsofstainremoval:Preparationofsoapand detergents.
15. KitchenGardens:Usewastecontainerstogrowanyfourtypesofgreens.
16. Preparesimpledishesusingdifferentgerminationmethods(anyfivefoods).

RelationshipMatrixforCOs,PosandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓		✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓		✓	✓	✓		
CO4	✓	✓	✓	✓	✓		✓		✓	✓
CO5	✓	✓	✓		✓	✓	✓	✓	✓	✓
NumberofMatches(✓)=43 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER – V

NUTRITIONINLIFECYCLE

CourseCode:23UND5CC9 **MaxMarks :100**
Hours/Week:5 **InternalMarks :25**
Credits :5 **ExternalMarks:75**

CourseOutcomes

CO1: Use nutrition knowledge to support human health at all life stages.
CO2: Linkfoodsandnutrientstohumanhealthneedsatdifferentlifestages. **CO3:** Describe and compare nutritional needs at various stages of life.
CO4: Collaboratetolearnaboutnutritionaldiseases.
CO5: Createdietaryplanstoaddressnutritionalimbalancesbasedonage,development,andhealth conditions.

UNIT–I:MENUPLANNINGANDNUTRITION

- Objectivesofmenuplanning,planningbalanceddiets,anduseoffoodexchangelists.
- NutritioninPregnancy:Foodandnutrientrequirements,physiologicalchanges,developmental stages of the embryo, physiological cost of pregnancy, and complications.
- NutritioninLactation:Foodandnutrientrequirements,physiologyoflactation,compositionof breast milk, influence of the mother's diet on milk production.

UNIT–II:NUTRITIONDURINGINFANCY

- Growthanddevelopmentduringinfancy,foodandnutrientrequirements.
- Advantagesofbreastfeeding,artificialfeeding,nutritionalneedsofpretermbabies.
- Weaning:Typesofweaningfoods,supplementaryfoods,andcommonweaningproblems.

UNIT–III:NUTRITIONDURINGPRESCHOOLAGE

- Foodandnutrientrequirements,eatinghabitsandbehavior,growthanddevelopment,andfactors inhibiting growth.
- **NutritionforSchool-goingChildren:**Foodandnutrientrequirements,growthpattern,packed lunches, and school lunch programs.

UNIT–IV:NUTRITIONFOR ADOLESCENCE

- Foodandnutrientrequirements,changesingrowthpattern,puberty,menarche,changesinfood habits.
- Nutritionalconcerns:Bingeeatingdisorder,predispositiontoosteoporosis,anemia,undernutrition, premenstrual syndrome, malnutrition due to early marriage, and relevant nutritional programs.

UNIT–V:NUTRITIONINADULTHOODANDOLDAGE

- **Adulthood:**Foodandnutrientrequirements,changesinconsumptionpatterns,physical,mental,and social factors influencing meal patterns.
- **OldAge:**Foodandnutrientrequirements,physical,physiological,biological,andpsychological factors influencing meal patterns.

References

1. Wardlaw,G.M.,Hampl,J.S.,DiSilvestro,R.A.(2004).*PerspectivesinNutrition*,6thEdition.McGraw-Hill.
2. Chadha,R.,&Mathur,P.(2015).*Nutrition:ALifecycleApproach*.OrientBlackSwan,NewDelhi.
3. Seth,V.,&Singh,K.(2006).*DietPlanningThroughtheLifeCycle:Part1NormalNutrition–APractical Manual*. Elite Publishing House Pvt. Ltd., New Delhi.
4. Robinson,S.(2006).*NormalandTherapeuticNutrition*.MacmillanPublishingCompany,NewYork.
5. Mudambi,S.R.,&Rajagopal,M.V.(2015). *FundamentalsofFood,Nutrition,andDietTherapy*.NewAge International Publishers, New Delhi.

RelationshipMatrixforCOs,Pos,andPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓		✓	✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO5	✓		✓	✓	✓		✓	✓	✓	✓
NumberofMatches(✓)=43 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER–V

ADVANCEDDIETETICS

CourseCode:23UND5CC10 **MaxMarks 100**
Hours/Week:5 **InternalMarks : 25**
Credits :5 **ExternalMarks: 75**

CourseOutcomes

CO1: Applyresearchprinciplesandmethodsinnutritionanddietetics.
CO2: Communicateeffectivelytoprovideinformationandadvicetoindividualsandcommunities.
CO3: Collectandanalyzedataonhealthandnutritionalstatus.
CO4: Useprofessional,ethical,andentrepreneurialjudgmenttopromoteexcellenceinnutritionand dietetics.
CO5: Planandconductindependentresearchinnutritionanddietetics.

UNIT–I:CONCEPTSINDIETTHERAPY

- Conceptsindiettherapy:Growthandscopeof dietetics.
- Purposesandprinciplesoftherapeuticdiets.
- Modificationsofnormaldiets.
- Classificationoftherapeuticdiets.

UNIT–II:DIETTHERAPYINOBESITY,UNDERWEIGHT&DIABETESMELLITUS

- Etiology,pathophysiology,clinicalsymptoms,andmetabolicalterations.
- Assessment/Indicatorsandlifestyle&dietaryguidelines.
- Obesity:Managementincludingbariatricsurgerytypes.
- Underweight:Nutritionalmanagementstrategies.
- Diabetes Mellitus: Acute and chronic complications, diet modifications, food exchange lists, insulin typesanduse,oralhypoglycemicagents,carbohydratecounting,glycemicindex,andglycemicload.

UNIT–III:DIETTHERAPYINGASTROINTESTINAL&LIVERDISORDERS

- Etiology,pathophysiology,clinicalsymptoms,assessment/indicators,andlifestyle&dietary guidelines.
- Conditionscovered:Diarrhea,dysentery,constipation,pepticulcer,jaundice,hepatitis,fattyliver, and cirrhosis.

UNIT–IV:DIETTHERAPYINCARDIOVASCULARANDKIDNEYDISEASES

- Etiology,pathophysiology,clinicalsymptoms,lifestyle&dietaryguidelines.
- Cardiovascular:Atherosclerosis,hyperlipidemia,hypertension.
- KidneyDiseases:Nephroticsyndrome,nephrolithiasis,acuteandchronicrenalfailure,dialysis,and kidney stones.

UNIT–V:DIETTHERAPYFORFEVER,INFECTIOUSDISEASES&CANCER

- Diettherapyforacuteandchronicinfectiousdiseases:Typhoid,tuberculosis,HIV/AIDS.
- Guidelinesformanagementofinfectiousdiseases.
- Cancer:Etiology,metabolicalterations,types,dietaryrecommendationsforcancersurvivors,and nutritional therapy for cancer.

References

1. Frazier,W.C.,&Westhoff,D.C.(2017). *FoodMicrobiology*,5thEdition.McGrawHill Education.
2. Adams,M.R.(2015).*FoodMicrobiology*,4thEdition.RoyalSocietyof Chemistry.
3. Paramita,P.(2016).*FoodPlanning*,1stEdition.
4. Roads,S.(2017).*HygieneandSanitationinFoodIndustry*,2nd Edition.
5. Pander,S.N.(2015).*FoodProcessingDesign*,LatestEdition.Manglam Publications.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	**ProgrammeOutcomes(POs)**					**ProgrammeSpecificOutcomes(PSOs)**				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓		✓		✓	✓		✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO5	✓		✓	✓	✓		✓	✓	✓	✓
NumberofMatches(✓)=43 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER-V

CORECOURSEXI-NUTRITIONINLIFECYCLEPRACTICAL-V

CourseCode	**: 23UND5CC11P**	**ExamHours**	**3**
InstructionHours:	**5**	**InternalMarks**	**40**
Credits	**: 4**	**ExternalMarks:**	**60**

CourseObjectives:

- Topractice,studentsabletoplanamenuforallagegroupsandspecialconditions.

CourseLearningOutcomes:

CO1: Understandthenutritivevaluesofrawandcookedfoods.
CO2: Planbalancedmealsfordifferentagegroupsandincomelevels.
CO3: Demonstratepreparationandpresentationofcommonfoods.
CO4: Developsuitabledietsforspecialconditionslikepregnancy,lactation,andoldage.
CO5: Applyskillsinmealplanning,preparation,andserving.

Course Content:

1. DisplayRawandCookedFoodMaterialsAccordingtoexchangelists(Milk,Meat,Pulse,Cereal,Vegetable- A, Vegetable-B, Fruit, and Fat), record their nutritive value.
2. Prepare and Display One Serving of Common Cooked Foods. Record weight and nutritive value for: Cereal preparations, Pulse preparations, Vegetable preparations, Fried snacks, non-vegetarian preparations, Bakery products, Chutneys, Sweets.
3. Plan, Prepare, and Serve a Meal for Different Income Groups: Low-income family, Middle-income family, High-income family
4. Plan,Prepare,andServeaMealforaPregnantWomaninthefirst,second,andthirdtrimesters.
5. Plan,Prepare,andServeaMealforaLactatingWomanfor0-6months,for6-12months
6. Plan,Prepare,andServeaMealforanInfant.Planandprepareindigenousweaning mixes.
7. Plan,Prepare,andServeaMeal foraPreschooler.
8. Plan,Prepare,andServeaMealforaSchool-goingChildforaboyandagirl.
9. Plan,Prepare,andServeaMealforanAdolescent.Planandprepareanyfivepacked lunches.
10. Plan,Prepare,andServeaMealforanAdultfora(sedentary,moderate,andheavy worker).
11. Plan,Prepare,andServeaMealforanOldAgePerson

References:

1. Srilakshmi,B.(2018).*Dietetics.*NewAgeInternationalP.Ltd.,NewDelhi.
2. *DietaryGuidelinesofIndians–AManual*,NationalInstituteofNutrition,Hyderabad,2015.
3. *DietaryGuidelinesofIndians–AManual*,NationalInstituteofNutrition,Hyderabad,2011.

RelationshipMatrixforCOs,POsandPSOs

Course Outcome(COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	□	□	□	□	□	□	□	□	□	□
CO2	□	□		□	□	□		□	□	
CO3	□	□		□	□	□	□	□	□	□
CO4	□	□	□	□	□	□		□	□	
CO5	□	□	□	□	□	□	□	□	□	□
NumberofMatches(P)= 44 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	01 – 14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER-

VCORECOURSE-XII

PROJECTWITHVIVA–VOICE–GROUPPROJECT

Course Code	**: 23UND5CC12**	**ExamHours**	**3**
InstructionHours:	**5**	**InternalMarks**	**25**
Credits	**: 4**	**ExternalMarks:**	**75**

GroupProjectGuidelinesforDieteticsTechniquesResearch:

Groupprojectsprovidehands-ontrainingindietetictechniquesnecessaryforresearch,fosteringcollaboration and diverse perspectives. Structured properly, they convert theoretical concepts into practical skills, promoting teamwork and problem-solving.

Hereareguidelinesforyourgroupproject:

- **ResearchProblemSelection:**Choosearesearchproblembasedoncreativeabilityandscientific thought.
- **ProblemDescription:**Provideabriefdescriptionoftheselectedproblem.
- **HypothesisFormulation:**Frameclearhypothesisstatementsrelatedtotheresearchproblem.
- **Objectives:**Clearlystatetheobjectivesoutlininghowtheprojectworkwillbecarriedout.
- **MethodologyDesign:** Designamethodologytotesttheformulatedhypothesis,clearlyoutlinethe steps and procedures involved.
- **ReliabilityofResults:** Ensurethattheresultsobtainedarereplicable,Providedetailedinformation on the experimental setup.
- **Documentation:**Submitawell-documentedreportuponcompletionoftheproject.Includeall relevant details such as methodology, results, and conclusions.

Remember,thegoalistonotonlydeveloppracticalskillsbutalsotocontributevaluableinsightstothefieldof dietetics. This project should encourage a research culture among students and have the potential to address real-life problems, benefiting society at large.

SEMESTER-V

DISCIPLINESPECIFICELECTIVE-I

PUBLICHEALTHNUTRITION

Course Code	**: 23UND5DE1**	**ExamHours**	**3**
InstructionHours:4		**InternalMarks**	**25**
Credits	**: 4**	**ExternalMarks**	**75**

Course objectives:

To enable students to help people to get recommended amounts of healthy foods and reduce the risk of chronicdiseases.

CourseOutcomes:

CO1: Demonstrateskillsincommunity-basednutritionprogramimplementationandevaluation**. CO2:** Gain knowledge on nutritional programs and policies for overcoming malnutrition.

CO3: Understandnational,international,andvoluntarynutritionalorganizationsaimedatcombating malnutrition.

CO4: Organizecommunitynutritioneducationprogramswiththeapplicationofcomputertechnology.

CO5: Applyimmunologicalinterventionprogramstoovercometheepidemicofcommunicablediseases.

Unit-I

- IntroductiontoPublicHealthNutrition:ANationalDevelopment-MeaningandScopeofPublic Health Nutrition,
- RolesandResponsibilitiesofPublicHealthNutritionists,
- DefinitionsofOptimumHealth,malnutrition(undernutrition,overweight,obesity,micronutrient deficiency),nutritionalstatus,NutritionIntervention,NutritionEducation,morbidity,MortalityRates.
- Malnutrition-EcologyConsequencesofMalnutrition,StrategiestoOvercomeMalnutrition.
- Relationofnutritiontonationaldevelopment,Nutritionandfoodsecurity.

Unit-II

- Nutritionalassessment-Introduction,DefinitionofNutritionalStatus
- Classificationofnutritionalassessment
- Direct Nutritional Assessment parameters -Anthropometry, clinical signs and symptoms, dietary assessment, and biochemical parameters.
- IndirectNutritionalAssessmentparameters-a)VitalStatistics:AgeSpecificMortalityRate,Morbidity and Cause of Specific Mortality, b) Ecological variables including crop production, and c) Economic factors, i.e., per capita income, population density & social habits

Unit-III

- Social&behaviorchangecommunication-Componentsandprocessofcommunicationfornutrition health promotion
- DefinitionsofFormal,non-formalcommunication,Participatorycommunication
- ComponentsofBCC(Sender,Message,Channel,Receiver)
- Varioustypesofcommunication–interpersonal,massmedia,visual,verbal/non-verbal.
- NeedforSBCCinIndia,Trainingworkersinnutritioneducationprogrammes

Unit –IV

- NutritionInterventionProgrammesinIndia–ICDS,Mid-DayMeal(MDM)program.
- Fortification program National Programs to Combat Micronutrient Malnutrition: NIPI, VAPP, and NIDDCP.
- Nationalandinternationalagenciesincombatingmalnutrition:International -WHO,FAO,UNICEF- Aim and functions. National-ICAR, ICMR,NIN, NFI, FNB, CFTRI, NNMB,NSI, DFRL-Aim and functions.

Unit-V

- Epidemiology of communicable diseases - Definition, causes, signs and symptoms, treatment and prevention of communicable diseases, Respiratory infections and intestinal infections, Other infections- dengue, Flu
- Typesofimmunity-active,passiveandherd-groupprotection
- Immunizationagents-vaccines,immunoglobulin
- Immunization schedules - National and WHO Expanded Programme on Immunization Universal Passive, Combined, Chemoprophylaxis, non-specific measures.

References:

1. Park, A. (2007). *Park's Textbook of Preventive and Social Medicine.* XIX Edition. M/S Banarasidas Bharat Publishers, Jabalpur.
2. Bamji, M. S., Prahlad Rao, N., Reddy, V. (2004). *Textbook of Human Nutrition.* II Edition. Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi.
3. Bhatt,D.P.(2008).*HealthEducation.*KhelSahityaKendra,NewDelhi.
4. Gibney,M.J.,Margetts,B.M.,Kearney,J.M.,Arab,L.(2004).*PublicHealthNutrition.*BlackwellPublishing Co., UK.
5. Swaminathan, M. (2007). *Essentials of Food andNutrition.An Advanced Textbook*Vol.I,The Bangalore Printing and Publishing Co. Ltd, Bangalore

RelationshipMatrixfor COs,POsandPSOs

Course Outcome(COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	□	□	□	□	□	□	□	□	□	□
CO2	□	□		□	□	□	□	□	□	□
CO3	□	□		□		□	□	□	□	□
CO4	□	□		□		□		□	□	
CO5	□	□	□	□	□	□	□	□	□	□
NumberofMatches(P)= 43 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	01 – 14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER-V

DISCIPLINESPECIFICELECTIVE-II

BASICINRESEARCH METHODOLOGY

CourseCode	**: 23UND5DE2**	**ExamHours**	**3**
InstructionHours:4		**InternalMarks**	**25**
Credits	**: 4**	**ExternalMarks:75**	

CourseObjectives:
Makethestudentstofindouttherealfactorsandachieverealthoughts.

CourseOutcomes:

CO1: Acquirebasicknowledgeontheroleandimportanceofresearchinscience.
CO2: Criticallyanalyzeresearchmethodologiesidentifiedinexistingliterature.
CO3: Understandthecomplexissuesinherentinselectingaresearchproblem,choosinganappropriateresearch design, and implementing a research project.
CO4: Developaresearchproposalorindustryproject plan.
CO5: Searchfor,select,andcriticallyanalyzeresearcharticlesandpapers.

UnitI:IntroductiontoResearch

- Meaning,Definition,Characteristics,Objectives,Motivation,Importance,andTypesofResearch.
- ResearchMethodsandResearchMethodology.
- CriteriaofaGoodResearch.

UnitII:LiteratureReviewandResearchDesign

- LiteratureReview:Definition,Purpose,andImportance.
- ResearchDesign:Definition,EssentialElements,Characteristics,andTypes.

UnitIII:SampleDesignandDataCollection

- SampleDesign:DefinitionandTypes.
- DataCollection:DefinitionandTypes.

UnitIV:DataProcessingandAnalysis

- ProcessingofData:Editing,Coding,Classification,andTabulation.
- AnalysisofData(Theory)
- MeasuresofCentralTendency:Mode,Median,and Mean.
- MeasuresofDispersion:Range,MeanDeviation,andStandardDeviation.

UnitV:ResearchReportandPresentation

- LayoutoftheResearchReport:PreliminaryPage,MainText,andEndMatter.
- TypesofReports:TechnicalandPopular.
- OralPresentation:StructureofPresentation.
- SampleResearchProposalinScience:Introduction,ProblemStatement,Objectives,PreliminaryLiterature Review, Methodology, and Reference.

References:

1. Kothari,C.R.(2004).*ResearchMethodology,MethodsandTechniques.*SecondRevisedEdition.NewAge International Publishers, New Delhi.
2. Ranjit Kumar (2011). *Research Methodology: A Step-by-Step Guide for Beginners.* Third Edition. SAGE Publications, New Delhi.
3. BeverleyMoriarty(2018).*ResearchSkillsforTeachers–FromResearchQuestiontoResearchDesign.* Allen&UnwinPublishers,Australia.
4. RajendraKumar,C.(2008).*ResearchMethodology.*AHPPublishingCorporation,NewDelhi.
5. PagadalaSugandaDevi(2017).*ResearchMethodology:AHandbookforBeginners.*NotionPress,Chennai.
6. VijayalakshmiPonnurajandSivaprakasam,C.(2008).*ResearchMethods:TipsandTechniques.*MJP Publishers.

RelationshipMatrixforCOs,POsandPSOs

Course Outcome(COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	□	□	□	□	□		□	□	□	□
CO2	□	□		□	□	□	□	□	□	□
CO3	□		□	□		□	□	□	□	□
CO4	□	□				□		□	□	
CO5	□	□	□	□	□	□	□	□	□	□
NumberofMatches(P) =41 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	01 – 14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER-VI

QUANTITYFOODSERVICE&PHYSICALFACILITIES

CourseCode : 23UND6CC13	**ExamHours 3**
InstructionHours:6	**InternalMarks 25**
Credits : 5	**ExternalMarks:75**

CourseObjectives:

CO1: Managethehumanresourceswithinafoodservicesorganizationordepartment.
CO2: Communicateappropriatelywithclients,staff,andmanagement. **CO3:**
Apply food service technology and operate industry equipment. **CO4:**
Develop nutritional menus for food service production.
CO5: Designandrunaquantityfoodserviceestablishment.

Unit-I

QuantityFoodService:MeaningandEvolution.Classificationoffoodserviceinstitutionsaccordingto: Function: Profit-oriented, service-oriented, and public health facility-oriented. Processing method: Conventionalsystem,commissarysystem,andfast-foodservicesystems.Serviceoffood:Self-service, tray service, and waiter-waitress service.

Unit-II

SpaceOrganization:Kitchen-Sizeandtype;developingkitchenplan;worksimplification-workarea, worker's area of reach, workspace, equipment materials and supplies, and movement at work; features to be considered in designing kitchen; kitchen layout.
Storagespace:Location,planning,layout,safetyandsecurity. Service
area: Location, planning, dimensions, and décor.
Equipment:Classification,selection,design,installation,operation,care,andmaintenanceof commonly used equipment.

Unit-III

Food Purchasing: Food buyer - Knowledge, quality, and functions of a food buyer; methods of buying food. Receiving and Storage of food: Delivery methods, delivery procedure; Receiving; Storage-organizationofstorage,generalprocedureforstorage;Storekeeping-storerecords,orderform, and goods received book.

Unit-IV

MenuPlanning:Menu-Definition,functions,needfor,andfactorstobeconsideredinmenu planning, procedure for writing a menu, types and construction of menu, menu display.
Standardizationofrecipe:Definition,methodsofstandardization,standardrecipeformat,anduses. Standard portion sizes: Definition, portioning equipment, and portion control.

Unit-V

FoodProduction:Meaning,typesoffoodproductionsystems,processoffoodproduction(briefly),large quantity cooking techniques, use of leftover food, and holding techniques.
Foodservice:Meaning,styles-waiterservice,self-service,andvending.

ReferenceBooks:

1. MohiniSethiandSurjeetMalhan,*CateringManagement-AnIntegratedApproach*,Thirdedition,New Age International Publishers, 2015.
2. Mohini Sethi,*InstitutionalFoodManagement*,Secondedition,New AgeInternationalpublishers,2016.
3. Kinton,R.,andCesarani,V.,*TheTheoryofCateringELBS*,VIIEdition,1992.
4. Lillicap,D.R.,andCousins,J.A.,*FoodandBeverageService*,ELBS,IVEdition,1994.

RelationshipMatrixforCOs,POsandPSOs

Course Outcome(COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	□	□	□	□	□		□	□	□	□
CO2	□	□		□	□	□	□	□	□	□
CO3	□		□	□		□	□	□	□	□
CO4	□	□			□	□		□	□	
CO5	□	□	□	□	□	□	□	□	□	□
NumberofMatches(P)=42Relationship: High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER-VI

FOODMICROBIOLOGY

CourseCode : 23UND6CC14 **ExamHours :3**

InstructionHours:6 **InternalMarks :25**

Credits : 5 **ExternalMarks :75**

CourseOutcomes:

CO1: Giveinsightintovarioustypesoffoodbornediseasesandtheirprevention.
CO2: Gaininformationaboutthemicrofloraof milk.
CO3: Studytheproductionoffermenteddairy products.
CO4: Impartcurrentknowledgeofprobiotics,prebiotics,andfunctionaldairyfoodsforhealth benefits.
CO5: Createasustainable,environmentallyandtechnologicallyadvanceddairyfarm.

Unit-I

MicroorganismsimportantinFoodMicrobiology:Mold,Fungi,Algae,Bacteria,andVirus –general characteristics. Contamination of foods – green plants and fruits, animals, sewage, soil, water, air duringhandlingandprocessing.Spoilage–cause,classification,factorsaffectingkindsandnumbers of microorganisms in food.

Unit-II

Spoilage of Different Groups of Foods - Cereal and cereal products, vegetables and fruits, meats and meat products, fish and other seafood, eggs, poultry, milk and milk products, and canned foods.

Unit-III

Food Preservation: Methods and principles of food preservation, delay of microbial decomposition, prevention of microbial decomposition, and removal of microorganisms. Preservation by use of high temperatures – factors affecting heat resistance of microorganisms, commercial heat preservation methods – sterilization, canning, pasteurization, blanching. Preservation by use of low temperatures – growth of microorganisms at low temperatures, low-temperature storage – cellar, chilling, and frozen.

Unit-IV

PreservationbyDrying:Methodsofdrying,factorsincontrolofdrying,treatmentsoffoodsbefore/after drying. Preservation by chemicals. Preservation by Irradiation – Microwave radiation, Ultraviolet radiation, and Ionizing radiation.

Unit-V

Food borne Illness- Food hazards, significance of food borne disease, incidence of food borne illness, risk factors associated with food borne illness. Bacterial agents of food borne illness – Clostridium botulinum, Escherichia coli, Salmonella, Shigella, and Staphylococcus – The organism, pathogenesis, clinical features, and association with foods.

ReferenceBooks:

1. AdamsM.R.,MossM.O.,*FoodMicrobiology*, NewAgeInternationalPublishers,NewDelhi, 2015.
2. William C Frazier, Dennis C Westhoff, *Food Microbiology*, McGraw-Hill Education Private Limited, New Delhi, 2014.
3. Sivasankar, *Food Processing and Preservation*,PHI Learning Private Limited, New Delhi,2015.
4. BranenA.L.andDavidson,P.M.*AntimicrobialsinFoods.*MarcelDekker,NewDelhi,1983.
5. Jay J.M., *Modern Food Microbiology.* 3rd Edn. VNR, New York. 9th Edition, Prism Books Pvt. Ltd., 1986.

RelationshipMatrixforCOs,POsandPSOs

Course Outcome(COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	□	□	□		□		□		□	
CO2	□	□		□	□	□	□	□	□	□
CO3	□		□	□		□	□	□	□	□
CO4		□			□	□		□	□	
CO5	□	□	□	□	□	□	□	□	□	□
NumberofMatches(P)=38 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER-VI

PRACTICAL-VI(DIETETICS)

CourseCode : 23UND6CC15P **ExamHours :3**

InstructionHours:6 **InternalMarks :40**

Credits : 5 **ExternalMarks:60**

CourseOutcomes:
CO1: Apply therapeutic nutrition in clinical diet planning.
CO2: Modifynormaldietsintohospitaldiets(liquidtoregular).
CO3: Analyze case histories and prepare SOAP notes.
CO4: Planmenuswithnutritionalcalculationsandfoodexchanges.
CO5: Developdietplansformajordiseasesandconditions.

Course Content:

- PreparationofAny5RecipesfortheFollowingTherapeuticHospitalDiets:Clearliquid,full liquid, semisolid, bland, soft, and regular diets.
- PlanningandPreparationofDietsfortheFollowingConditionsUsingSOAPFormatfor Nutritional Management:

(Studentshavetoanalyzethegivencasehistory,prepareSOAPnote,planaday'smenu,andcalculate the nutritional requirements. Record must include Food plan (total exchanges/day), meal pattern, and menu (distribution of exchange into meals and snacks).

a) Obesityandunderweight
b) Gastrointestinaldisorders–Pepticulcer,diarrhea,andconstipation
c) Febrilecondition-typhoidandTB
d) Diseasesofliverandgallbladder-Hepatitisandcirrhosis.
e) Diabetesmellitus
f) DiseasesofcardiovascularsystemAtherosclerosisandHypertension
g) Diseasesofkidneyandurinarytract–Nephrolithiasis,Nephroticsyndrome,andkidneystones
h) Cancerand AIDS.

ReferenceBooks:

1.V.Vimala,*AdvancesinDietTherapy-PracticalManual*,NewAgeInternationalPublishers, 2010.

RelationshipMatrixforCOs,POsandPSOs

Course Outcome(COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	□	□	□		□		□		□	
CO2	□	□		□	□	□		□	□	□
CO3	□		□	□		□	□		□	□
CO4		□			□	□		□	□	
CO5	□	□	□	□		□	□	□		□
NumberofMatches(P)=34 Relationship:Moderate										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER-VI

DIETCOUNSELLING

CourseCode	**: 23UND6DE3**	**ExamHours**	**3**
InstructionHours:	**6**	**InternalMarks**	**25**
Credits	**: 4**	**ExternalMarks**	**75**

CourseOutcomes:

CO1: Understandingthedietcounsellingskillsandacquaintthemwithbasicprinciples.
CO2: Determineandtranslatenutrientneedsintomenusforindividualsandgroupsacrossthelifespan, in diverse cultures and religions.
CO3: Studentswillbeabletointerpretandapplynutritionconceptstoevaluateandimprovethe nutritional health of individuals with medical conditions.
CO4: Produceoralandwrittencommunicationsforagroupeducationsession.
CO5: Interviewindividualsfordiethistoriesandcounselindividuals.

UnitI:

Dietitian–Classification,codeofethics,responsibilities.Computerapplication–Useofcomputersby dietitian, dietary computations, dietetic management, education/training, information storage, and administration. Teaching aids used by dietitians - charts, leaflets, posters, etc., preparation of teaching material for patients.

UnitII:

DietCounselling–meaning,significance,process,types,goalsofcounselling,individuals,group,and family counselling. Basic sequence in counselling. Communication process in counselling and linguistics in clinical dietary practices, problems in communication.

UnitIII:

Techniquesofobtainingrelevantinformation-Retrospectiveinformation,DietaryDiagnosis, Assessing food and nutrient intakes, Lifestyles, Physical activity, Stress, Nutritional Status.
Correlating Relevant Information and identifying areas of need. The Care Process – Setting goals and objectives short term and long term, Counselling and Patient Education, Dietary Prescription. Motivation-HospitalizedpatientsandOutpatients.

UnitIV:

Counselling Skills Approaches to counselling – Psychoanalytic approach, Behaviourist, Humanistic approach. Pre–Helping phase: Rapport building skills, attending and listening skills.
StageIskills:Empathy,respect,Genuineness,andconcreteness.
StageIIskills:Advancedempathy,self-disclosure,Immediacy,andConfrontation. Stage III skills: Goal setting, Action plan Program, and Brainstorming.

Unit V:

Teaching aids used by dietitians - charts, leaflets, posters, etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis, and cirrhosis.

ReferenceBooks:

1. Gibson,R.L.,Mitchell,M.H.(2005).*Introductiontocounsellingandguidance(6th Ed).*
2. Gelso,C.J.,Fretz,B.R.(1995).*CounsellingPsychology*,Bangalore,PrismBooksPvt Ltd.
3. Sharma, T.C. (2002). *Modern Methods of Guidance and Counselling*,New Delhi, Sarup &Sons.
4. MahanLKandEscottStumpS(2013).*Krause'sFood&NutritionTherapy,*13thed.Saunders-Elsevier.
5. StacyNix(2009).*William'sBasicNutritionandDietTherapy,*13thEdition.ElsevierMos.
6. Thomas Briony; (1995). *Blackwell Manual of Dietetic practice (2nd Ed.).* Oxford: New York, 1995.

RelationshipMatrixforCOs,POsandPSOs

Course Outcome(COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	□	□	□		□		□	□	□	
CO2	□	□	□	□	□	□		□	□	□
CO3	□	□	□	□		□	□		□	□
CO4		□		□	□	□	□	□	□	
CO5	□	□	□	□		□	□	□	□	□
Numberof Matches(P)=40 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh

SEMESTER-VI

NUTRITIONFORSPORTSANDFITNESS

CourseCode : 23UND6DE4 **ExamHours 3**

InstructionHours:6 **InternalMarks :25**

Credits : 4 **ExternalMarks:75**

CourseOutcomes:

CO1: Explaintheprinciplesoffitnessandnutrition(suchassettingrealisticshort-termbehaviorchange goals and the relationship of exercise and diet to stress reduction).
CO2: Complement each other in helping to develop psychological well-being and overall health.
CO3: Identify some of the social and cultural influences onfood habits and exercise/activity patterns.
CO4: Evaluate current nutritional information with regard to its contribution to health and physicalfitness.
CO5: Applytheknowledgeacquiredforplanningadietforathletes.

Unit-I

Physical Fitness: Definition; benefits of physical activity; Physiology and biochemistry of exercise: Muscle contraction; weight and body composition of athletes; adaptation of muscle and body physiology to exercise; effect of excessive physical exercise on the cardiovascular and pulmonary system.

Unit-II

Energysourcesformuscleuse:ATP,phosphocreatine,glucose,fat,andprotein;anaerobicmetabolism for high-intensity bursts and power; aerobic metabolism for endurance. Nutritional assessment and counselling for athletes.

Unit-III:

Nutritionalrequirement:Effectofdifferentialintakesofmacronutrients(carbohydrates,protein,and fat) onathleticendeavour;hydration strategies tooptimize physicalactivity capacity;importance of timing the nutrient and fluid intake to match tissue requirements.

Unit-IV:

Nutritional needs and plans for sports requiring power and speed before, during, and after exercise. Nutritional needsandplansfor sportsrequiringendurancebefore,during,andafter exercise.Nutrition plan for sports requiring combined power and endurance.

Unit-V:

Nutrition needs of male, female, younger, and older athletes. Ergogenic aids: Effect of ergogenic aids and othersubstances onphysical activity; sports drinks forendurance activities; nutrition supplements available for athletes.

Reference Books:

1. Gordan.M.Wardlaw,*PerspectivesinNutrition,fourthedition,*McGrawHillcompanies.1999.
2. Antia.F.P.andPhilipAbraham,*ClinicaldieteticsandNutrition,*fourthedition,Oxford University Press. 2002.
3. Srilakshmi.B.,*Dietetics,*seventhedition,NewAgeInternational(P)Limited.2014.
4. L. Kathleen Mahan, Sylvia Escott-stump, *Krause's Food, Nutrition, and Diet therapy,* ninth edition, W.B. Saunders company. 1996.
5. DonBenordot,*Advancedsportsnutrition,*secondedition,HumanKinetics,2012.

RelationshipMatrixforCOs,POsandPSOs

Course Outcomes (COs)	ProgrammeOutcomes(POs)					ProgrammeSpecificOutcomes(PSOs)				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	□	□	□		□		□	□	□	
CO2	□	□	□	□	□	□		□	□	□
CO3	□	□	□	□		□	□			□
CO4				□	□	□	□	□	□	
CO5	□	□	□			□	□	□	□	□
Numberof Matches(P)=38 Relationship:High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	VeryPoor	Poor	Moderate	High	VeryHigh