AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY

SCHOOL OF PHYSICALSCIENCES

AMRITAPURI,BENGALURU,COIMBATORE,CHENNAI

DEPARTMENTOFSCIENCES

B.Sc. Honors

Food Science and Nutrition

CURRICULUM AND SYLLABI (2025)

(NEP 2020 Based Curriculum)

B.Sc. Honors

Food Science and Nutrition

CURRICULUM AND SYLLABI (2025)

Preamble

The preamble of the Undergraduate curriculum framework- 2023 underlines the historical perspective, philosophical basis and contemporary realities of higher education as enshrined in the NEP 2020 and endeavors to synchronize cornerstones while charting the road ahead for the state of higher education.

The undergraduate Curriculum framework-2023 (UGCF) for B.Sc (Hons) Food Science and Nutrition is meant to bring about systemic change in the higher education system in the University and align itself with the National Education Policy 2020. The following objectives of NEP are kept inperspective while framing UGCF

- To promote each student's holistic development in both academic and on academic spheres
- To provide flexibility to students so that learners have the ability to choose their learning trajectories andprograms,andtherebychoosetheirpathsinlifeaccordingtotheirtalentsand interests
- Toeliminateharmfulhierarchiesamongdisciplines/fieldsofstudyandsilosbetweendifferent areas of learning
- Multidisciplinary and holistic education to ensure the unity and integrity of all knowledge
- Topromotecreativityandcriticalthinkingandtoencouragelogicaldecision-makingand innovation
- To promote ethics and human and constitutional values
- To promote multi lingualism and the power of language in learning and teaching
- To impart life skills such as communication, cooperation, teamwork, and resilience
- To promote outstanding research as a corequisite for outstanding education and development

GENERALINFORMATION

ABBREVIATIONS USEDINTHECURRICULUM

L – Lecture
T - Tutorial
P-Practical
Cr–Credits
LO–Learning Objective
CO - Course Outcome
PO–Programme Outcome
PEO-Programme Education Objective
PSO – Programme Specific Outcome
HUM-Humanities (including Languages and others)
SCI - Basic Sciences (including Mathematics)
CSE–Computer Science Engineering
CUL - Cultural Education
CES – Centre for Environmental Studies
CIR-Corporate and Industrial
Relationship
DSC-Discipline Specific Core
DSE-Discipline Specific
Elective
SEC-Skill Enhancement Course
VAC- Value Addition Course
GE- Generic Elective
AEC-Ability Enhancement Course

Course Outcome (CO) – Statements that describe what students are expected to know, and are able to do at the end of each course. These relate to the skills, knowledge and behavior that students acquire in their progress through the course.

Program Outcomes (POs) – Program Outcomes are statements that describe what students are expected to know and be able to do upon graduating from the Program. These relate to the skills, knowledge, attitude and behaviour that students acquire through the program. NBA has defined the Program Outcomes for each discipline.

PROGRAMME EDUCATION OBJECTIVE(PEO):

Food Science graduates will be able to:

PEO1: Perform well in applied nutrition fields including public health and clinical nutrition

PEO2: Serve in the core food industry, which leverages diverse food science domains including food chemistry, product development, safety & quality control.

PEO3: Contribute to the skilled manpower requirement in this fieldsoas to address societal& national needs

PROGRAM OUTCOME (PO):

1. **Scientific Knowledge**: Apply the knowledge of biological sciences as a basis for understanding the role of food and nutrients in health and diseases.
2. **Design/development of solutions**: Design solutions for health and nutritional problems and design productsthatmeetthespecifiedneedswithappropriateconsiderationforthepublichealthandsafety, and the cultural, societal and environmental considerations.
3. **Environment and sustainability:** Understand the impact of food processing and preservation solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
4. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the nutrition and health care practice.
5. **Individual and team:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
6. **Communication:** Communicate effectively on nutritional and health burdens with the scientific community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
7. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of health care management.

PSOFORB.SC.HONS.FOOD SCIENCE AND NUTRITION

After the successful completion of the program, the students are expected to

PSO1: Comprehend the association between nutrients with physiology, diseases and dietary solutions.

PSO2: Apply knowledge and technical skills in assessing, evaluating and providing healthcare solutions for individuals and communities.

PSO3: Associate the theoretical knowledge and skills acquired to the food industry.

PSO4: Develop expertise to servethe society and nation

SEMESTER I

Offered by	NEP Category	Course Code	Course Title	LTP	Credits
SCI	DSC	25FSN101	Food Science & Experimental Foods	3 1 0	4
SCI	DSC	25FSN102	Principles of Nutrition	3 1 0	4
SCI	DSC	25FSN103	Food Processing Preservation–1	2 2 0	4
SCI	DSC	25FSN181	Food Science & Experimental Foods(P)	0 0 3	1
HUM	SEC	24ENG101	English I	2 0 0	2
HUM	AEC		Language I	2 0 0	2
CUL	VAC	22ADM101	Foundations of Indian Heritage	2 0 1	2
CUL	VAC	22AVP103	Mastery Over Mind	1 0 2	2
			Totalcredits		**21**

SEMESTER II

Offered by	NEP Category	Course Code	CourseTitle	LTP	Credits
SCI	DSC	25FSN111	NutritionThroughlife Span	3 1 0	4
SCI	DSC	25FSN112	HumanPhysiology	3 0 1	4
SCI	DSC	25FSN113	FoodProcessingandPreservation-II	3 1 0	4
SCI	DSC	25FSN114	Food Chemistry	3 0 0	3
SCI	DSC	25FSN182	NutritionThroughlifeSpan(P)	0 0 3	1
SCI	DSC	25FSN183	FoodProcessingandPreservation(P)	0 0 3	1
SCI	DSE	25FSN184	Food Chemistry(P)	0 0 3	1
HUM	SEC	24ENG111	EnglishII	1 0 2	2
HUM	AEC		LanguageII	2 0 0	2
CUL	VAC	22ADM111	GlimpsesofGlorious India	2 0 1	2
			Totalcredits		**24**

SEMESTER III

Offeredby	NEP Category	Course Code	CourseTitle	LTP	Credits
SCI	DSC	25FSN201	NutritionalBiochemistry	3 1 0	4
SCI	DSC	25FSN202	ClinicalNutritionandDietetics–I	2 2 0	4
SCI	DSC	25FSN281	NutritionalBiochemistry(P)	0 0 3	1
SCI	DSC	25FSN282	ClinicalNutritionandDietetics-I(P)	0 0 3	1
SCI	DSE		ProfessionalElective A*	3 0 0	3
SCI	GE		GenericElectiveA#	3 0 0	3
CSE	SEC	25FSN203	BasicsofComputerApplications	2 0 0	2
	GE		FreeElective1**	2 0 0	2
CIR	AEC	23LSK201	LifeSkillsI	1 0 2	2
CUL	VAC		AmritaValueProgrammeI	1 0 0	1
			Totalcredits		**23**

SEMESTERIV

Offeredby	NEP Category		CourseTitle	LTP	Credits
SCI	DSC	25FSN211	Food Microbiology	3 0 0	3
SCI	DSC	25FSN212	ClinicalNutritionandDietetics-II	2 2 0	4
SCI	DSC	25FSN283	FoodMicrobiology(P)	0 0 3	1
SCI	DSC	25FSN284	ClinicalNutritionandDietetics-II(P)	0 0 3	1
CES	AEC	24ENV200	EnvironmentalScienceandSustainability	3 1 0	4
SCI	DSE		ProfessionalElectiveB*	3 0 0	3
SCI	DSE		ProfessionalElectiveC*	3 0 0	3
	GE		FreeElective2**	2 0 0	2
CIR	AEC	23LSK211	LifeSkillsII	1 0 2	2
SCI	Community Outreach	25FSN290***	LiveinLabs***	0 0 3	[3]
CUL	VAC		AmritaValueProgrammeII	1 0 0	1
			Totalcredits		**24**

SEMESTERV

Offered by	NEP Category	CourseCode	CourseTitle	LTP	Credits
SCI	DSC	25FSN301	FoodProductDevelopmentandMarketing	3 1 0	4
SCI	DSC	25FSN302	FoodService Management	3 1 0	4
SCI	GE		GenericElectiveB#	3 0 0	3
SCI	DSC	25FSN303	PackagingandLabellingofFoodProducts	2 1 0	3
SCI	DSC	25FSN381	FoodProductDevelopment (P)	0 0 3	1
SCI	DSC	25FSN382	FoodServiceManagement(P)	0 0 3	1
CIR	AEC	23LSK301	LifeSkillsIII	1 0 2	2
SCI	Community Outreach/ DSE	25FSN390***	LiveinLabs***/ProfessionalElectiveA*	0 0 3/3 0 0	3
			Totalcredits		**21**

SEMESTER VI

Offered by	NEP Category	CourseCode	CourseTitle	LTP	Credits
SCI	DSC	25FSN311	CommunityNutrition	3 1 0	4
SCI	DSC	25FSN312	AnalyticalInstrumentation	2 0 0	2
SCI	GE		GenericElective-A#	3 0 0	3
SCI	DSC	25FSN313	FoodProductEvaluation	1 1 0	2
SCI	DSE		ProfessionalElective B*	3 0 0	3
SCI	DSC	25FSN314	ResearchMethodologyandBio Statistics	2 2 0	4
SCI	DSC	25FSN383	FoodAnalysis(P)	0 0 3	1
SCI	Project	25FSN399	Project(AdditionalforExitOption)		6
	Project	25FSN398#	Internship#/Coreelective(Continuing Students)		3
			Totalcredits		**22/25**
			Totalcredits(I+II+III+IV=V+VI)		**135/138**

SEMESTERVII

Offered by	NEP Category	Course Code	CourseTitle	LTP	Credits
SCI	DSC	25FSN401	PublicHealthNutrition	2 2 0	4
SCI	DSE		ProfessionalElective-A*	3 0 0	3
SCI	GE		GenericElective-B#	3 0 0	3
SCI	DSC	25FSN402	NutraceuticalsandFunctionalFoods	3 1 0	4
SCI	DSC	25FSN403	Food&Nutrition Research Techniques	3 1 0	4
SCI	DSE		ProfessionalElective-B*	3 0 0	3
SCI	DSC	25FSN481	TechniquesofExperimentalNutrition	0 0 3	2
			Totalcredits		**23**

SEMESTERVIII

Offeredby	NEP Category	Course Code	CourseTitle	LTP	Credits
SCI	DSC	25FSN411	NutritioninHealthandFitness	3 1 0	4
SCI	DSE		ProfessionalElective-C*	3 0 0	3
SCI	GE		GenericElective–A/B#	3 0 0	3
SCI	Project	25FSN499	MajorProject		12
			Totalcredits		**22**
			Total Credits (I+II+III+IV+V+VI+VII+VIII)		**180**

* Professional Elective courses (A, B and C) are to be taken by each student, one each at the 3rd, 4th, 5th, 6th,7th and the 8th semester, from the list of electives offered by the Department.

** Free Electives - This will include courses offered by Faculty of Humanities and Social Sciences/ FacultyArts, Commerce and Media / Facultyof Management/AmritaDarshanam - (International Centre for Spiritual Studies).

*** Students undertaking and registering for a Live-in-Lab project, can be exempted from registering for an Elective course in the higher semester.

Generic Elective courses (A & B) are to be taken by each student, one each at the 3rd, 5th, 6th,7th and the 8th semester, from the list of generic electives offered by the Department.

PROFESSIONALELECTIVES

Offeredby	Category	CourseCode	CourseTitle	LTP	Credits
ELECTIVESA					
SCI	DSE	25FSN331	FoodHygieneandSanitation	3 0 0	3
SCI	DSE	25FSN332	AdolescenceHealthandLifestyle	3 0 0	3
SCI	DSE	25FSN333	NutritionforAthletes	3 0 0	3
ELECTIVESB					
SCI	DSE	25FSN341	Home-scalepreservationoffoods	3 0 0	3
SCI	DSE	25FSN342	BasicsofFoodEngineering	3 0 0	3
SCI	DSE	25FSN343	CareerOpportunitiesinFoodScience and Nutrition	3 0 0	3
ELECTIVESC					
SCI	DSE	25FSN351	BakeryandConfectionery	2 0 1	3
SCI	DSE	25FSN352	HospitalityManagement	3 0 0	3
SCI	DSE	25FSN353	FoodSafetyandQualitycontrol	2 1 0	3
CORE ELECTIVES					
Offeredby	**Category**	**CourseCode**	**CourseTitle**	**LTP**	**Credits**
SCI	DSE	25FSN361	Food Fortification	3 0 0	3
SCI	DSE	25FSN362	FoodIndustryManagement	3 0 0	3

GENERICELECTIVES

GENERICELECTIVEA

Offeredby	Category	CourseCode	CourseTitle	LTP	Credits
SCI	GE	25FSN371	FoodToxicology	3 0 0	3
SCI	GE	25FSN372	NutritioninEmergencies andDisasterManageme	30 0	3
SCI	GE	25FSN373	PhysicalChemistryofFoodConstituents	30 0	3
GENERICELECTIVEB					
SCI	GE	25FSN375	Post-HarvestTechnology	3 0 0	3
SCI	GE	25FSN376	FoodBioTechnology	3 0 0	3
SCI	GE	25FSN377	NutritionEducationandCommunication	3 0 0	3

LANGUAGES

	PaperI				Paper II		
24MAL101	MalayalamI	2 00	2	24MAL111	MalayalamII	2 00	2
24HIN101	HindiI	2 00	2	24HIN111	HindiII	2 00	2
24KAN101	KannadaI	2 00	2	24KAN111	KannadaII	2 00	2
24SAN101	SankritI	2 00	2	24SAN111	SanskritII	2 00	2
24TAM101	Tamil I	2 00	2	24TAM111	Tamil II	2 00	2
24ENG100	AdditionalEnglish–I	2 00	2	24ENG110	AdditionalEnglish-II	2 00	2

AMRITAVALUEPROGRAMMESFORUGPROGRAMMES

CourseCode	Title	L-T-P	Credits
22ADM201	StrategicLessonsfromMahabharatha	1-0-0	1
22ADM211	LeadershipfromRamayana	1-0-0	1
22AVP210	KeralaMuralArtandPainting	1-0-0	1
22AVP201	Amma'sLifeandMessagetothemodernworld	1-0-0	1
22AVP204	LessonsfromtheUpanishads	1-0-0	1
22AVP205	MessageoftheBhagavadGita	1-0-0	1
22AVP206	LifeandMessageofSwamiVivekananda	1-0-0	1
22AVP207	LifeandTeachingsofSpiritualMastersofIndia	1-0-0	1
22AVP208	InsightsintoIndianArtsand Literature	1-0-0	1
22AVP213	TraditionalFineArtsofIndia	1-0-0	1
22AVP214	PrinciplesofWorshipinIndia	1-0-0	1
22AVP215	TempleMuralArtsinKerala	1-0-0	1
22AVP218	InsightsintoIndianClassical Music	1-0-0	1
22AVP219	InsightsintoTraditionalIndianPainting	1-0-0	1
22AVP220	InsightsintoIndianClassicalDance	1-0-0	1
22AVP221	IndianMartialArtsandSelfDefense	1-0-0	1
22AVP209	YogaandMeditation	1-0-0	1

FREEELECTIVESOFFEREDUNDERHUMANITIES/SOCIALSCIENCESTREAMS				
Cat.	CourseCode	Title	LTP	Credit
HUM	23CUL230	AchievingExcellenceinLife-AnIndianPerspective	2 00	2
HUM	23CUL231	ExcellenceinDailyLife	2 00	2
HUM	23CUL232	ExploringScienceandTechnologyinAncientIndia	2 00	2
HUM	23CUL233	YogaPsychology	2 00	2
HUM	23ENG230	BusinessCommunication	1 03	2
HUM	23ENG231	IndianThoughtthroughEnglish	2 00	2
HUM	23ENG232	InsightsintoLifethroughEnglishLiterature	2 00	2
HUM	23ENG233	TechnicalCommunication	2 00	2
HUM	23ENG234	IndianShortStoriesinEnglish	2 00	2
HUM	23FRE230	ProficiencyinFrenchLanguage(Lower)	2 00	2
HUM	23FRE231	ProficiencyinFrenchLanguage(Higher)	2 00	2
HUM	23GER230	GermanforBeginnersI	2 00	2
HUM	23GER231	GermanforBeginnersII	2 00	2
HUM	23GER232	ProficiencyinGermanLanguage(Lower)	2 00	2
HUM	23GER233	ProficiencyinGermanLanguage(Higher)	2 00	2
HUM	23HUM230	EmotionalIntelligence	2 00	2
HUM	23HUM231	GlimpsesintotheIndianMind-theGrowthofModern India	2 00	2
HUM	23HUM232	GlimpsesofEternalIndia	2 00	2
HUM	23HUM233	GlimpsesofIndianEconomyandPolity	2 00	2
HUM	23HUM234	HealthandLifestyle	2 00	2
HUM	23HUM235	IndianClassicsfortheTwenty-firstCentury	2 00	2
HUM	23HUM236	IntroductiontoIndiaStudies	2 00	2
HUM	23HUM237	IntroductiontoSanskritLanguageandLiterature	2 00	2
HUM	23HUM238	NationalServiceScheme	2 00	2
HUM	23HUM239	PsychologyforEffectiveLiving	2 00	2
HUM	23HUM240	PsychologyforEngineers	2 00	2
HUM	23HUM241	ScienceandSociety-AnIndianPerspective	2 00	2
HUM	23HUM242	TheMessageofBhagwatGita	2 00	2
HUM	23HUM243	TheMessageofthe Upanishads	2 00	2
HUM	23HUM244	UnderstandingScienceofFoodandNutrition	2 00	2
HUM	23HUM245	Service Learning	2 00	2
HUM	23JAP230	ProficiencyinJapaneseLanguage(Lower)	2 00	2
HUM	23JAP231	ProficiencyinJapaneseLanguage(Higher)	2 00	2
HUM	23SWK230	CorporateSocialResponsibility	2 00	2
HUM	23SWK231	WorkplaceMentalHealth	2 00	2

SEMESTERI

FOODSCIENCEANDEXPERIMENTALFOODS

SemesterI	**HoursofInstruction/week–4**
CourseCode:25FSN101	**No.ofCredits–4**
L-T-P–C 3-1-0-4	**Total60 hrs.**

Prerequisite: BasicFoodGroups,cookingmethods,effectsofcooking

CourseObjectives:

1. Toimpartknowledgeonfoodgroupsanditsnutritionalcomposition
2. Torelatetheimpactofcookingonthestabilityofnutrients.
3. Toanalyzethechangesduringprocessingandstorageonthenutritionalcompositionoffoods.
4. Tostudythefactorsinfluencingthecookingqualityofdifferentfoods.

CourseOutcomes:

CO1:Acquireknowledgeonthefoodgroupsandfactorsinfluencingthechangesindifferentcooking methods.

CO2:GainknowledgeonnutritivevalueofCereals,Pulses,NutsandOilSeeds,Fats,Oilsandchanges affecting the nutritive value during cooking methods.

CO3: Gaininformationonthe classification and composition offruits and vegetables

CO4: Gaininsight oncompositionand nutritive valueof meat, poultry, dairyandfish

CO5: Outline the stages of sugar, types of beverages and role of spices in cookery.

Skills:

- Developskillsonvariouscookingmethodsandmediumofcooking.
- Acquireskillsinprocessingandstorageoffoods.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	-	-	1	3	-	-	-
CO2	2	1	-	-	-	-	1	3	-	1	-
CO3	2	1	-	-	-	-	1	2	-	3	-
CO4	2	1	-	-	-	-	1	2	-	3	-
CO5	2	1	-	-	-	-	1	2	-	2	-

Syllabus:

UnitI-IntroductionofFoodGroupsandCookingMethods **12 hrs.**

Foods,Classification,Functions,Foodgroups,BalancedFood,Foodpyramid,Myplate

Cooking-ObjectivesofCooking,Preliminarypreparation,cookingmethods,Dryheat,Moistheat,Meritsand Demerits.

Unit II - Cereals, Pulses, Nuts and Oil Seeds, Fats and Oils **12hrs.**

Structure, Composition and Nutritive Value, Changes in Nutritive Value during Cooking, cooking quality

Cereals- Cereal cookery concepts, fermented products, non-fermented products, breakfast cereals

Pulses-Factorsaffectingcookingqualityofpulses,toxicconstituents,pulsecookery.

Nutsandoilseeds-Nutsandoilseedscookery,toxinsinnutsandoilseeds

Fats&Oils–Typesandclassificationoffats,Roleoffats/oilincookery

UnitIII-VegetablesandFruits **12hrs**

Vegetables-Classification,CompositionandNutritiveValue,Selection,Vegetablecookery-pigments, Changes in Nutritive Value, fungi and algae as foods

Fruits-Classification,CompositionandNutritiveValue,enzymaticandnon-enzymaticbrowning,vegetables and fruits as functional foods, Pectic substances and gel formation

UnitIV-Meat,Poultry,Dairyand Fish **12hrs.**

Milk–CompositionandPropertiesofmilk,NutritiveValue,effectofheat,acid,enzymes,phenoliccompounds and salts. Microorganisms, Role of milk and milk products in cookery

Egg-Structure,CompositionandNutritiveValue,Qualityofeggs,Eggcookery,BuyingandHandling,Role of eggs in cookery.

FleshyFoods-Structure,CompositionandNutritivevalueofmeat,Effect ofcookingoncolour,Textureand flavour, Meat cookery.

Poultry-Classification,CompositionandNutritivevalue

Fish-Classification,Composition,Selection,Fishcookery

UnitV-Sugars,Beverages,SpicesandCondiments **12hrs**

Sugars - Nutritive value, Properties, Stages of sugar cookery, Sugar Related Products, Sugar Cookery and Artificial Sweetener.

Beverages-Classification,Nutritivevalue–Coffee,Tea,Cocoa,Chocolate,FruitBeverages,SoupsVegetable Juices, Milk Based Beverages, Malted Beverages, Aerated and Non-Alcoholic Beverages, Miscellaneous Beverages, Alcoholic Beverages.

SpicesandCondiments: Types,Functionalproperties,Roleofspicesincookery.

TextBooks:

1. Srilakshmi.B.FoodScience,NewAgeInternationalPvtLtdPublishers,7rdEdition,2018.
2. ShakuntalaManay,Shadaksharaswamy.MFoods,FactsandPrinciples,NewAge InternationalPvtLtd Publishers, Sixth Edition, 2015.
3. Foodscience,ChemistryandExperimentalfoodsbyM.Swaminathan.
4. Swaminathan,M.:HandBookofFoodScienceandExperimental Food
5. FoodScienceandNutrition,SunetraRoday,3rdedition,2018.

ReferenceBooks:

1. Brow,A.,UnderstandingFood,ThomsonLearningPublications,Wadsworth,2020.
2. Mehas,K.Y.andRodgers,S.L.FoodScienceandYou,McMillanMcGrawCompany,NewYork,2021.
3. Parker,R.IntroductiontofoodScience,Delmer,ThomsonLearningCo.,Delma,2019.

EvaluationPattern:

Assessment	Internal	External
*ContinuousAssessment(CA)	20	
Periodical(P1)(P2)/Mid-term	30	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

PRINCIPLESOFNUTRITION

SemesterI	**Hoursof Instruction/week–4**
CourseCode:25FSN102	**No.ofCredits–4**
L-T-P –C 3-1-0-4	**Total60 hrs.**

Prerequisite: Nutrients,Sources,Functionsandmetabolism.

CourseObjectives:

1. Tobuildbetterunderstandingonnutritionscience forhealthpromotionanddisease prevention
2. Toimpartknowledgeonfunctions,metabolism,requirementsandeffectsofdeficiencyofnutrients.
3. Tooutlinethevitallink betweennutritionandhealth ofindividuals.

CourseOutcomes:

CO1:UnderstandtheprinciplesofEnergyrequirements,measurements,andenergymetabolisminindifferent age group.

CO2:Gainknowledgeontheclassification,composition,sources,functions,metabolismofcarbohydrates, dietary fibres, and proteins.

CO3:Understandtheclassification,composition,sources,functions,digestion,andabsorptionof Lipids and Water

CO4:Acquireaknowledgeofcomposition,sources,toxicity,functions,metabolismoffatandwater soluble vitamins.

CO5:Obtainknowledgeontheclassification,distributioninthebody,functions,Source, requirements, deficiency of minerals and antioxidants.

Skills: Learnskillsindevelopingabalanceddietbasedonindividualrequirements**. CO-**

PO Mappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-	1	-	1	2	1	3	-
CO2	3	-	-	-	1	-	1	3	1	3	-
CO3	3	-	-	-	1	-	1	3	1	3	-
CO4	3	-	-	-	1	-	1	3	1	3	-
CO5	3	-	-	-	1	-	1	3	1	3	-

Syllabus:

UnitI:Energy **12 hrs.**

Energy, Units of Energy, Measurement of Calorific Value, Physiological fuel values, Determination of energy requirements-Direct and Indirect calorimetry, Relation between Respiratory quotient and Energy output, Specific dynamic action of foods (Diet Induced Thermo genesis) definition, determinationofbasalmetabolism-BenedictsRothApparatus,FactorsAffectingBMR,determination of energy metabolism during work- Energy requirements for various age groups.

UnitII:Carbohydratesand protein **12hrs.**

Carbohydrates - Classification, composition, sources, functions, digestion, absorption, glycemic index and metabolism, Requirements (RDA) and deficiency. Dietary fiber – definition, sources, functions and types - Soluble and Insoluble Fiber.

Proteins - Classification, composition, sources, functions, digestion, absorption and metabolism, Requirements(RDA)anddeficiency.Aminoacid-classificationandfunctions.Evaluationofprotein quality-PER, NPU, NDPER, BV and Chemical score.

Unit III:LipidsandWater **12 hrs.**

Lipidsandfats-Classification,composition,Sources,Essentialfattyacids,functions,digestion, absorption, metabolism and Requirements

WaterandelectrolyteBalance-Distributionofwaterandelectrolytes,Functions,Requirements, Sources, water balance.

UnitIV:Vitamins **12 hrs.**

Fat soluble vitamins - Chemistry, Functions, Sources, absorption, transport, metabolism, Requirements, Deficiency and toxicity.

WaterSolubleVitamins -Chemistry, Functions, Sources, absorption, transport and metabolism, Requirements, Deficiency and toxicity.

UnitV:Mineralsand Antioxidants **12 hrs**

Macro minerals - Classification, Distribution in the body, Functions, Source's, absorption, storage, metabolism, storage, requirements, deficiency and toxicity- Calcium, Phosphorus, Magnesium.

Microminerals-Classification,Distributioninthebody,Functions,Sourcesabsorption,metabolism, storage, requirements, deficiency and toxicity- Sodium, Potassium, Copper, Iron, Zinc, Iodine and Fluorine, selenium

Antioxidants-Freeradicals damage,Oxidantdefensesystem,Antioxidantsindiseases,Sources.

TextBooks:

1. Srilakshmi,B.,NutritionScience,NewAgeInternational(P)Ltd.,NewDelhi,8thEdition,2023.
2. Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahmam, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2015
3. Swaminathan,M.,AdvancedTextbookonFoodandNutrition,Vol.1,SecondEdition,Bangalore Printing and Publishing Co. Ltd., Bangalore, 2015.

ReferenceBooks:

1. DietaryGuidelinesforIndians, ICMR,National InstituteofNutrition,Hyderabad,2024.
2. Gordon M. Wardlaw, Paul M.Insel, Perspectives in nutrition 11th edition, Mosby- year Book,Inc.St.Louis,Missouri, 2019
3. KrauseandMahan'sFood&theNutritionCareProcess,16thEdition,JaniceLRaymond,ISBN: 9780323810258, 2022

EvaluationPattern:

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes, Assignment, Projects,and Reports, and Seminar

FOODPROCESSINGANDPRESERVATION–I

SemesterI	**HoursofInstruction/week–4**
CourseCode:25FSN103	**No.ofCredits–4**
L-T-P – 2-2-0-4	**Total60 hrs.**

Pre-requisite: Basicsoffoodprocessing&preservationmethods

CourseObjectives:
Todiscussandapplytheprinciplesandmethodsinvolvedintheprocessingofdifferentfoodgroupsandthe preservation methods.

CourseOutcomes:
CO1:Comprehendtheprinciples andsignificance offoodanditsprocessing.
CO2:Understandtheprinciplesandusageoftraditionalandmodernprocessingandpreservationmethods. CO3: Gain knowledge on processing and preservation of foods using chemical methods.
CO4:Tolearnontheimportance andtypesoffermentation methods.
CO5:Obtainknowledgeonfoodprocessingandpreservation ofdifferent foodproducts.

Comparevariousmilletprocessingtechniques.iii.Discusspulseprocessingandpreservationtechniques.iv. Identify oil seed processing and preservation. v. Explain spice processing and preservation techniques.
Skills: Developskillsinvariousfoodprocessingtechniques

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	-	-	-	1	-	2	3	2
CO2	2	2	1	-	-	-	1	-	2	3	2
CO3	2	2	1	-	-	-	1	-	2	3	2
CO4	2	2	1	-	-	-	1	-	2	3	2
CO5	2	2	1	-	-	-	1	-	2	3	2

Syllabus:

UnitI-IntroductiontoFood Processing and Preservation 12 hrs.

Principles,Objectives,advantagesanddisadvantagesoffoodprocessing,advantagesinfoodindustry, significanceoffoodpreservation,Deteriorationoffoodquality,causesofspoilage-microbialactivity, enzymaticactivity,insects,parasitesandrodents,chemicalreactions,environmentalfactorsandtime, spoilage of various foods and products

UnitII–ThermalTechnology ofFoodProcessingandPreservation 12 hrs

Objectivesofdifferentmethods
Thermaltechnologies-pasteurization,blanching,thermalsterilization,ohmicheating,magnetic heating, microwave heating, sous-vide cooking, refrigeration, freezing, removal of moisture/water,

dehydration, lowering water activity- sun drying, air drying, superheated steam drying, solar energy and heating, vacuum drying and freeze drying.

UnitIII–ThermalTechnology of FoodProcessingandPreservation 12 hrs

Objectivesofdifferentmethods

Non-thermal technologies-Pulsed electric field, ultrasound, use of modified atmosphere, pulsed light treatment,highpressureprocessing,ionizingradiation,osmoticinhibition-useofsalt,smoking,hurdle technology.

UnitIV–Fermented FoodandChemical Preservatives 12hrs

Principles and importance of fermentation, types of fermentation, factors controlling fermentation, microbial culture used in food industry, fermented products

Additives, Need for additives, classification of additives-intentional additives and non-intentional additives, types of chemical preservatives

UnitVProcessedandPreserved FoodProducts 12 hrs.

Puffed rice, bread, soyproducts, types of milk products, jam, jellies, fruit juice concentrates, sauces, minimally processed fruits and vegetables, processed meat, sea food and flesh foods

Relatedpracticalexperiences

1. Visittofoodprocessingunits

TextBooks:

1. ShakuntalaManay,N.andShadaksharaswamy,M.,(2023)Foods–FactsandPrinciples,5th Edition, New Age International (P) Limited Publishers, New Delhi, 2013.
2. G.SubbulakshmiandShobaAUdipiFoodProcessingandpreservation,NewAgeInternational Publishers, New Delhi, 2nd edition, 2022.
3. SivasankarB,(2022)FoodPreservationandProcessing,1stEdition,Prentice–HallofIndia Private Ltd., New Delhi.
4. ModernFoodMicrobiology,JamesM.Jay,(2006),7thEdition,CBSPublishersandDistributors, New Delhi.

ReferenceBooks:

1. Fellow,P.,FoodProcessingTechnology(2016)–PrinciplesandPractices,3rdEdition,CRC Press Woodland Publishers, England.
2. Adams,M.R.andMoss,M.O.,FoodMicrobiology,(2015)NewAgeInternational(P)Ltd., New Delhi.
3. Sommers,C.H.andXvetengFan,(2016)FoodIrradiationResearchandTechnology,2nd Edition, Blackwell Publishing, New Delhi.
4. ManualofmethodsofAnalysisoffoods,fruitandvegetableProcessing, FSSAI,2016.

EvaluationPattern:

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment, Projects, andReports,and Seminar

FOODSCIENCEANDEXPERIMENTALFOODS PRACTICAL

SemesterI	**Hoursof Instruction/ week –3**
CourseCode:25FSN181	**No.of Credits–1**
L-T-P – 0-0-3-1	**Total45 hrs.**

Prerequisite: Foodgroups,nutrients,cookingskills,cookingmethods.

CourseObjectives:

- Tounderstandthefundamentalprinciplesoffoodscience,includingbasicsoffoodgroups,methods of measuring ingredients, and factors influencing gluten formation and gelatinization.
- Todevelopessentialculinaryskillsandtechniquesacrossavarietyoffoodcategories,includingeggs, cereals, vegetables, pulses, milk, and flesh foods.
- Learntheimportanceofsensoryevaluationinrecipeformulationsofsugarcookery,cerealcookery, pulse cookery, milk cookery, vegetable cookery, egg cookery, and flesh cookery.

CourseOutcome:

CO1: Understandfundamentalfoodscienceprinciples,includingcategorizationoffoodgroups, measuring ingredients, gluten formation, and gelatinization and improve culinary processes.

CO2: Gainproficiencyinculinarytechniquesacrossadiversefoodcategoryincludingcookingeggs, cereals, vegetables, pulses, milk, and flesh foods.

CO3: Understandthesignificanceofsensoryevaluationandimplementingduringdifferentrecipe formulation.

CO-POMapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	2	-	-	1	-	1	3	-	2	-
CO2	3	-	-	-	1	-	1	3	-	2	-
CO3	3	-	-	-	1	-	1	3	-	2	-

Skills:

Develop skillsinvariouscookingmethods involved.

Practical

45 hours

S. No	TitleofExperiments	CourseOutcome
	Basicsof Food Science	
1.	FoodGroups	CO01
2.	MethodsofMeasuringIngredients	CO01
3.	DeterminationofEdible Portion	CO01
4.	GlutenFormation	CO01
5	FactorsAffectinggelatinization	CO01

6.	PreparationofPaneer	CO01
7.	Methodsof Cooking Rice	CO01

ExperimentalCookery		
8.	Experimental CookerywithEggs	CO02
9.	Experimental CookerywitCereals	CO02
10.	Experimental CookerywithVegetables	CO02
11.	Experimental CookerywithPulses	CO02
12.	Experimental CookerywithMilk	CO02
13.	Experimental Cookeryon FleshFoods	CO02
14.	StagesofSugar Cookery	CO02
RecipeFormulation		
15.	IntroductiontoSensoryEvaluation	CO03
16.	CerealCookery	CO03
17.	Pulse Cookery	CO03
18.	Milk Cookery	CO03
19.	VegetableCookery	CO03
20.	EggCookery	CO03
21.	FleshCookery	CO03

References:

1. CGopalan,Nutritivevalueof Indianfoods,2023
2. DrM Swaminathan,Advancedtextbookon food&nutrition,vol 2,2022
3. BelleLowe,Experimentalcookeryfromchemical andphysicalstandpoint,2018
4. NormanPotter,FoodScience,2007

EvaluationPattern:

Internal(CA)	External	Total
80	20	100

CA–RegularLab Assessment

24ENG101 **EnglishI** **2 0 0 2**

Objectives:

To help students obtain an ability to communicate fluently in English; to enable and enhance the students' skills in listening, speaking, reading, and writing; to impart an aesthetic sense and enhance creativity

Cos	Course Outcomes
CO 1	Demonstratecompetence inthemechanicsof writing
CO 2	Summariseaudio and writtentextsto conveymessages effectively
CO 3	Applymechanics of writingandAItools to draftacademicand professionaldocuments
CO4	Organiseideasandthoughtsforclearwrittenandoral communication
CO 5	Criticallyevaluate literarytexts

Unit I

Mechanics of writing - Parts of speech – use of prepositions, adjectives, adverbs and determiners – word order – collocation – concord (Subject-Verb, Pronoun-Antecedent) – kinds and patterns of sentences

Unit II

Tenses - Modal auxiliaries - Reported speech - Active and Passive Voice - Phrasal Verbs - Linkers/ Discourse Markers - Question Tags

Unit III

Pre-writing techniques - Paragraph writing – Cohesion – Development – types: definition, comparison, classification, contrast, cause and effect - Essay writing: Descriptive and Narrative - Introductiontothe useof Gen AIin writing(AItools,Do'sand Don'ts whileusingAI, howto write prompts, etc.)

Unit IV

Listening comprehension (3 pieces – Do Schools kill creativity? By Sir Ken Robinson, Steve Jobs' 2005 Stanford Commencement Address, India Questions Dr Abdul Kalam- Aired August 2007) - Reading Comprehension – Skimming and Scanning- Inference and Deduction – Reading different kinds of material – Speaking**:** Narration of incidents / stories/ anecdotes.

Unit V

ShashiTharoor–"'KindlyAdjust'toOur English

A.G.Gardiner–"AFellowTraveller"

Ruskin Bond – "The Eyes Have It"

Mrinal Pande – "Girls"

W.H.Auden–"UnknownCitizen" W

H Davies - "Leisure" **References:**

1. Murphy,Raymond,*Murphy'sEnglishGrammar,*CUP, 2004
2. Syamala,V.*SpeakEnglishinFourEasySteps*,ImproveEnglishFoundationTrivandrum:2006
3. Martinet,Thomson,*APracticalEnglishGrammar*,IVEd.OUP,1986.
4. TheWeek -June03,2018,LAST WORD;

https://www.theweek.in/columns/shashi-tharoor/2018/05/25/kindly-adjust-to-our-english.html?fbclid=IwAR3IhtdXqvuV4ySECn9S7SA6HmCEYISyd1QHd3BlwKgiNKKwdkeSg3qWp-U/

5. AGGardiner–*LeavesintheWind*,Digicat(e-book),2015
6. RuskinBond–*TheBestofRuskinBond*;IndiaPenguin.April 2016.
7. MrinalPande–*SteppingOut*;PenguinIndia;2003
8. WHAuden–*AnotherTime*;RandomHousePub;1940
9. WilliamHDavies–*SongsofJoyandOthers*;AndesitePress,August2017.
10. SirKenRobinson–"Doschoolskillcreativity?".https://go.ted.com/6WoC
11. SteveJobs'2005StanfordCommencementAddress.
https://youtu.be/UF8uR6Z6KLc?si=1nMNYJOk3Yw7H7tF
12. IndiaQuestionsDrAbdulKalam(aired:August2007).
https://youtu.be/erg3CmVm6M4?si=YudsxXZOFY1do91C

24MAL101 **MalayalamI** **2 0 0 2**

CourseObjectives:

- Toenablethestudentstoacquirebasicskillsinfunctionallanguage.
- Todevelopindependentreadingskillsandreadingforappreciatingliteraryworks.
- Enable students to communicate in the language they have studied in a range of contexts and for a variety of purposes
- Toanalyselanguageincontexttogainanunderstandingofvocabulary,spelling,punctuationandspeech

Courseoutcomes:

CO1:Developtheabilitytoreadandcriticallyappreciateagiventext CO2:
Develop fluency in speaking the language
CO3:AbilitytoblendlanguageandIndianspirituality.

Unit	Topic
1	**Adhyatmaramayanam,**Tharopadesam(EnthinnuSokam….thulom) **----------** **Jnanappana**(sthanamanangal….Trishnakondubhramikkunnathokkeyum)
2	ModernPoets:Mampazham-VyloppillySreedharamenonCriticalanalysisofthepoem.
3	Shortstoriesfromperiod1/2/3:**Poovanpazham**-VaikaomMuhammedBasheer
4	LiteraryCriticism:**BharathaParyatanam**-*VyasanteChiri*–Ithihasastudies-Kuttikrishna Marar-OutlineofliteraryCriticisminMalayalamLiterature
5	Error-freeMalayalam:**1**.Language; **2**.Clarityofexpression; **3**.Punctuation-Thettillatha Malayalam–Writing-**a**.Expansionof ideas; **b**.PrecisWriting; **c**. Essay Writing

Textbooks/Reference:

1. Adhyatmaramayanam– ThunjathRamanujanEzhuthachan
2. Ramayanavichinthanam-Dr.A.M.Unnikrishnan
3. ThunjanPadhanangal-Prof.PanmanaRamachandran
4. CompleateWorks includingJnanappana-Poonthanam
5. Vyloppilly-M.N.Vijayan
6. Vyloppilli-Vyakthi,Kavi-Dr.M.Leelavathi/S.GupthanNair
7. BasheerintePoonkavanam-Prof.M.N.Karasseri
8. Basheer-Life&Works
9. BharathaParyatanam-KuttikrishnaMarar
10. LavanyasastrathinteYukthisilpam-Dr.ThomasMathew

11)Thettillatha Malayalam – Prof.Panmana Ramachandran Nair(His all books on Error FreeMalayalam)

24HIN101	HINDII	2 00	2

Course Objective: The course will enable the students to understand the basics of grammar and usage, to appreciate the literary compositions, and to understand the intricacies of language and literature.

CourseOutcomes: Bytheend ofthecoursethe students will be able to:

1. Distinguishvariousliterarygenres.
2. Exploretraditionandculturethroughliterature.
3. Applythebasicsofgrammar.
4. Criticallyanalysetheprescribedliterarytexts.

UNIT1

HindiSahithyakiPanchshreshtKahaniyam**:**

a. SughmayJeevan–ChandradharSharma,Guleri
b. DhankiBhent-RabindranathTagore
c. Anbola–JayashankarPrasad
d. Swamini(Manasrovarbhagh-1)Premchand

UNIT2.

HindiKavitha:

a. 'Aarya"–MaithiliSharan Gupth
b. "MeribhiabhaheIsmein'.,"MubarakHoNayaSaal"-_Nagarjun
c. "NishaaKirodetaRakesh-Niharse'.,ShoonyaMandirmeinBanoongi-SandhyaGeet se-Mahadevi varma
d. 'KhoobLadiMardanivahthoJhansiValiranithi'-subhadraKumari chohan

UNIT3.

Hindi Ekanki**:**

a) MohanRakesh:AndekeChilke
b) VishnuPrabhakar:SarkariNoukari

UNIT4.

Grammar:1)Karak2)Upasarg3)Pratyay4)VakyaRachana5)Padaparichay.6)Sarvanam7)kriya8)Adjective 9)Adverb10)Tenses

REFERENCE

1. SugamHindiVyakarn,:Prof.Vanshidhar&DharmapalShastri
2. VyavaharikHindiVyakarantathaRachana:Dr.HardevBahari
Shiksharthi HindiVyakaran:Dr. Nagappa
3. HindiSahithyakiPanchshreshtKahaniyam**:**Editedby:Dr.SachidanandhShuklu (Printed and Published by V&S publishers, Abridged, AnsariGanj, Delhi)
4. HindiSamay.com,/Hindikahani.com/exoticindiaart.com

24KAN101	KannadaI	2 0 0 2

Objectives:

- Toenablethestudentstoacquirebasicskillsinfunctionallanguage.
- Todevelopindependentreadingskillsandreadingforappreciatingliteraryworks.
- Enable students to communicate in the language they have studied in a range of contexts and for a variety of purposes
- Toanalyselanguageincontexttogainanunderstandingofvocabulary,spelling,punctuationandspeech

CourseOutcome

CO1	Developtheabilitytoread,listenandwriteinKannadaandtounderstandanduse thelanguageinavarietyofcontextsand situations
CO2	Toenablethelearnerstounderstandthegrammaticalstructuresofclassesofwords
CO3	Developabilitytospeakfluentlyandinteractivelyinbothpersonaland professional context

CourseContents

UNIT – 1

AdalithadalliKannadadabalake:(UseofKannadainbusinessandadministration) Bhashe – swaroopa, stityantaragalu,
Aadubhashe,pradeshikabhashe,Grantikabhashe
Paaribhaashika padagalu

UNIT–2

Padagalarachane,deshiya–anyadeshiyapadagalu Lekhana
Chinnhegalu
Kannadabharavanigeyashuddhamattuashuddharoopagalu, Dwiruktigalu,
jodunudigalu

UNIT–3

Nudigattgalu,gaadevistarane
Listeningtoradiospeech,tonguetwister-practice

UNIT–4

PatraLekahna-aupachaarikahaaguanoupachaarika
Kandikegala rachane
Prabandhagalu:vivaranaatmakahaaguniroopanatmaka

UNIT–5

Poems

- Vachanagalu–kaalugalembavugaalikandaya–Allamaprabhu,Ratnadasankoleyaadadetodarallve– Akkamahadevi, ole hatti uridare nilabahudallade - Basavanna
- Keerthanegalu–Tanuvanirolagaddiphalavenu–Purandaradasa,Tallanisadirukandyataalumanave- Kanakadaasa
- Tripadigalu–Saalavanukombaagahaalogarundante-Sarvagna
- Janapadageetegalu-Yaakebadtaadtitamma

Shortstories

- Sambhanda–ShrikrishnaAlanahalli
- Moksha–Sethuram

Prabandhagalu

- NammaManeyaDeepa–Ha.Ma.Nayak
- BhadhukuKanasalla,OndhuKale–NKKulakarni

References:

1. H.S.KrishnaswamyIyangaar–AdalithaKannada–Chetanapublication,Mysuru
2. KannadaVyakaranamattuRachane–N.GopalakrishnaUdupa,M.C.C.Publication
3. G.H.Naayak–KannadaSannaKathegalu–ChetanaBookHouse
4. ShatamaanadaLalithaPrabandha–GurulingaKaapase-KarnatakaSahityaAcademy
5. Naavalla–Kathasankalana–Sethuram
6. BasavannanavaraVachanagalu–G.V.Shastri–Paaruprakashana
7. KannadadaBalake–H.S.KrishnaswamyIyangaar–Chetanabookhouse
8. SarvagnanaVachanagalu–VenkataSubbaiha,VijayavaahiniPublications

24SAN101	SANSKRITI	2 0 0 2

CourseObjectives:

- Toenablethestudents toacquirebasic skillsinfunctional language
- Todevelopindependentreadingskillsandreadingforappreciatingliteraryworks.
- Toanalyselanguageincontexttogainanunderstandingofvocabulary,spelling,punctuation and speech
- GrasptheconnectionbetweenSanskritlanguageand Indian philosophy

CourseOutcomes:

CO1ReadandunderstandSanskritversesandsentencesandcommunicateinSanskrit CO 2

Imbibe values of life and Indian tradition propounded by the scriptures

ModuleI

Introduction to Sanskrit language, Devanagari script - Vowels and consonants, pronunciation, classification of consonants, conjunct consonants, words – nouns and verbs, cases – introduction, numbers, Pronouns, communicating time in Sanskrit. Practical classes in spoken Sanskrit

ModuleII

Verbs- Singular, Dual and plural — First person, Second person, Third person.

Tenses–Past,Presentandfuture–Atmanepadiandparasmaipadi-karthariprayoga.

ModuleIII

Generalgroupwordsforcommunicationandmoralstories.

ModuleIV

ChanakyaNeetichapterIII(partI),BhagavadGitachapter14 (partI)

ModuleV

Translationofsimplesentencesfrom SanskrittoEnglishandvice versa.

24TAM101	TAMILI	2 0 0 2

CourseObjectives:

ToteachTamilforeffectivecommunicationindifferentspheresoflife: -culturalrelationsinsociety.

Course Outcomes:

1. GivingexposuretohistoryofTamilliteratureandIntroductionofselectClassics
2. InitiatingStudentstothespiritofBhaktiliterature
3. Encouraging creativity of students by teachingContemporary Literature poetry, modern poetry, Short Story, Prose,Novel, etc
4. IntroductionofbasicGrammar,LetterwritingandessaywritingskillsofTamillanguage.

அலகு-1

தமிழ்இலக்கியவரலாற்றில்சங்கஇலக்கியம்:முதல்,இடை,கடைசங்கம்.
சங்கஇலக்கியங்கள்பத்Fப்பாைட்டு.
குறுந்ததாடக(6,8பாடல்கள்),
புறநானூறு(184,192பாடல்கள்).
சங்கம்மருவியகாலஇலக்கியம்:
சிலப்பதிகாரம் (வழக்குடறக்காடத),
பதிதெைட்கீழ்கெக்குநூல்கள்,
திருக்குறள் (மருந்F)

UNIT-1 History of Tamil Literature: First, Intermediate, Last sangam. Sangam Literature, Pattuppaattu. Kuṟuntogai, Puṟanaanuuru.
LiteratureoftheSangamMaruviyaperiod–Silappathiagaram(vazhakkuraikaathai),PatiṇeṇkiizhKaṇakkuNuulkal. TirukkuṟaL (Marunthu)

அலகு2

பக்திஇலக்கியம்:–
பன்னிருதிருமுடறகள்அறிமுகம்,
மாைட்க்கவாசகர்(திருவாசகம்-சிவபுராைம்)

UNIT2BhaktiLiterature–IntroductiontoPanniruThirumuraikal,Manikkavasagar(Thiruvasagam-SivaPuranam)

அலகு-3

தற்காலஇலக்கியம்:-

கவிதை :

பாதியார்(குயில்பாைட்டு),பாரதிதாசன்(தமிழின்இனிடம
). **உதைநதை**:ஞா.ததவதநயப்பாவாைர் (தமிழும்திரவிைமும்சமமா?),
பரிதிமாற்கடலஞர் (தமிழ்தமாழியின்வரலாறு (ஆதிவரலாறு)).
சிற்பி(வள்ளுவர்வகுக்கும்இன்பம்)

சிறுகதை: அழகியதபரியவன்–(வனம்மாள்)

நாவல்: இடமயம்(தபத்தவன்)

UNIT-3ContemporaryLiterature:Poetry-Bharathiar(kuyilpāṭṭu),Bharathidasan(tamiḻiṉiṉimai,iṉpattamiḻ)Pattukottai Kalyanasundaram.
Prose:G.DevaneyaBhavanar(TamizhumDhiravidamumsamamaa?),Paritimāṟkalaiñar(paranarkettaparisu),chirbi (valluvarvakukkuminbam)
ShortStory:AzhagiyaPeriyavan–(VanammaaL) Novel:
Imaiyam (Peththavan)

அலகு–4ததால்காப்பியம்:
எழுத்F – பிறப்பியல்.
நிறுத்தக்குறிகள்மற்றும்
கடிதம்எழுFதலும்கைட்டுடரஎழுFதலும்

UNIT–4tolkāppiyam:Alphabet–piṟappiyal.PunctuationmarksandLetterwritingandessaywriting.

REFERENCE

இடமயம்,தபத்தவன்,க்ரியாதவளியீடு2019.

அழகியதபரியவன்,அழகியதபரியவன்கடதகள்,நற்றிடெபதிப்பகம்,2016
சி.பாலசுப்பிரமெியன்,கைடுடர-வளம்,நறுமலர்ப்பதிப்பகம்,பத்தாம்பதிப்பு1994
பரிதிமாற்கடலஞர்,தமிழ்தமாழியின்வரலாறு,பூம்புகார்பதிப்பகம்,ஆறாம்பதிப்பு2013.
அகளங்கன்,பன்னிருதிருமுடற–அறிமுகம்,இந்Fமாமன்றம்வவுனியா,1994
ரா.சீனிவாசன,தமிழ்இலக்கியவரலாறு,https://ta.wikisource.org/s/99uk
மாெ◌ிக்கவாசகர்(திருவாசகம்-சிவபுராெம்
தபான்மெிமாறன் “அதைான்தமிழ்இலக்கெம்“அதைான்பப்ளிஷிங்குரூப்,வஞ்சியூர், திருவனந்தபுரம், 2007.
http:/www.tamilvu.org/libirary/libindex.htm.
http:/www.gunathamizh.com/2013/07/blog0post_24.html

24ENG100	AdditionalEnglish– I	2 002

Objectives:

- ToexposestudentstovariousgenresofEnglishliterature
- ToexposethestudentstoIndianEnglishWritingofdifferenttimelines.
- Todevelopasensibilitytoreadandunderstandliteraryworks.
- Tointroduceafewlinguisticdevicestoenablethemtoappreciateliteraryformsstylistically

COs	CourseOutcomes
CO 1	IdentifyanddistinguishvariousgenresofEnglishLiteratureforbetterunderstanding
CO 2	Demonstrateanabilitytocomprehendandanalyseliteratureindependently
CO 3	Developorenhancethe ability toappreciate anduse linguistic devices forstylistic analysis

Unit-I

Introductionto Literature – Nature &Elementsof Literature, literature as anexpressionofpersonal & historic aspects. Narrative structure & technique.Introduction to Indian Literature:Pre-independence, postindependence, themes, writers, and problems.

Unit-II

LinguisticDevices:Theme,Diction,syntax&syntacticaldeviations,Rhetoricaldevices,figuresofspeech

Unit-III

Poetry:

TheFrogandtheNightingale byVikramSeth
AnIndianLoveSong*bySarojiniNaidu*
DeathoftheWolf byToruDutt

Unit IVShortstories:

Detail-

ADog'sLifebyMulkRajAnand
InterpreterofMaladiesbyJumphaLahiri

Unit-V

Non-DetailReading:

ThreePersonsbyVijaySheshadri
TheWolf'sPostcriptTo'LittleRedRidingHood'**byAghaShahid Ali**
TheNaiveFriendsbyPremchand
TheWomanonPlatform8byRuskinBond

CoreReading:

- Iyengar,Srinivasa–***TheIndianContributiontoEnglishLiterature.***KarnatakishingHouse,Bombay,1945
- Iyengar,Srinivasa–***IndianWritinginEnglish:1800-1980***–SterlingPublishingHouse, 2019

References

- Seth,Vikram,***BeastlyTales,***PenguinIndia,2013
- Naidu,Sarojini,***TheGoldenThreshold***1905
- Dutt,Toru-***ASheafGleanedinFrenchFields***1876
- Anand,RajMulk,***SelectedShortStories***PenguinIndia,2006
- Tagore,Rabindranath,***MashiandOtherStories,***TrueSignPublishingHouse,2021
- Lahiri,Jumpha-***InterpreterofMaladies***HarpercollinsPublishersIndia,2005
- Sheshadri,Vijay–POETRYMagazine,December2010
- Ali,ShahidAgha,***TheWolf'sPostcriptTo'LittleRedRidingHood***'AcademyofAmericanPoets,poets.org

- ***Premchand - , Mindfuel's 4 In 1 Story By Munshi Premchand - Power Of A Curse, The Naive Friends, AComplex Problem & A Lesson In The Holy Life*** **Mindfuel Publishers,*2020***
-
- *Bond,Ruskin-**TheWomanonPlatform8,*** **TheIllustratedWeeklyofIndia**

Evaluation Pattern:

AssessmentComponent	**Weightage**
Continuous Evaluation (Class Tests, Assignment, Class Activity)	20
MidTermExamination	30
EndSemesterExamination	50
Total	**100**

22ADM101	FOUNDATIONSOFINDIANHERITAGE	L-T-P-C:2-0-1-

CourseObjective(s)

To introduce students to the depths and richness of the Indian culture and knowledge traditions, andtoenablethemtoobtainasynopticviewofthegrandioseachievementsofIndiaindiversefields. To equip students with aknowledge of their country and its eternal values.

CourseOutcomes

COs	Description
CO1	IncreasestudentunderstandingoftrueessenceofIndia'sculturalandspiritualheritage.
CO2	EmancipatingIndianhistoriesandpracticesfrommanipulation,misunderstandingsandotherideological baggage thus, shows its contemporary relevance.
CO3	Understandtheethicalandpoliticalstrategicconceptstoinducecriticalapproachtovarioustheories aboutIndia.
CO4	Familiarizestudentswiththemultidimensionofman'sinteractionwithnature,fellowbeingsand societyingeneral.
CO5	Appreciatethesocio-politicalandstrategicinnovationsbasedonIndianknowledgesystems.Givesan understandingofbringingIndianteachingintopracticallife.

CO-POMapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	2	2	-	-	-	3	-	-	-
CO2	-	-	-	-	-	-	1	2	-	-	-	3	-	-	-
CO3	2	-	-	-	-	2	3	3	-	-	-	-	-	-	-
CO4	-	-	3	-	3	2	3	-	-	-	-	3	-	-	-
CO5	2	-	1	2	-	1	3	1	-	-	-	2	-	-	-

Syllabus

1. Chapter1-EducationalHeritageofAncientIndia
2. Chapter2-LifeandHappiness
3. Chapter3-ImpactofColonialismandDecolonization
4. Chapter4-AtimelineofEarlyIndianSubcontinent
5. Chapter5-Indianapproachtowardslife
6. Chapter6-CircleofLife
7. Chapter7-PinnacleofSelflessnessandultimatefreedom
8. Chapter8-Oceanoflove;IndianMahatmas.
9. Chapter9-BecomeAStrategicThinker(Games/Indicactivity)
10. Chapter10-Man'sassociationwithNature
11. Chapter11-Celebratinglife24/7
12. Chapter12-MetaphorsandTropes
13. Chapter13-India:IntheViewsofforeignScholarsandTravellers.

Self-Study/Self-reading

14. Chapter14-PersonalityDevelopmentThroughYoga.
15. Chapter15-HallmarkofIndianTraditions:AdvaitaVedanta,Theoryofoneness
16. Chapter16-ConversationsonCompassionwithAmma

Textbooks/References

1. FoundationsofIndianHeritage

Evaluation Pattern

Assessment	Weightage(%)
Midterm	30
ContinuousAssessment	20
EndSemesterExam	50
TotalMarks	100

22AVP103	MasteryOverMind(MAOM)	1-0-2 2

1. CourseOverview

Master Over the Mind (MAOM) is an Amrita initiative to implement schemes and organise university-wide programs toenhancehealthandwellbeingof allfaculty, staff,andstudents(UNSDG -3). Thisprogramaspart of our efforts for sustainable stress reduction gives an introduction to immediate and long-term benefits and equips every attendee to manage stressful emotions and anxiety facilitating inner peace and harmony.

With a meditation technique offered by Amrita Chancellor and world-renowned humanitarian and spiritual leader, Sri Mata Amritanandamayi Devi (Amma), this course has been planned to be offered to all students of all campuses of AMRITA, starting off with all first years, wherein one hour per week is completely dedicated for guided practical meditation session and one houron the theory aspects of MAOM. The theory section comprises lecture hours within a structured syllabus and will include invited guest lecture series from eminent personalities from diverse fields of excellence. This course will enhance the understanding of experiential learning based on university's mission: "Education for Life along with Education for Living", and is aimed to allowlearnerstorealizeandrediscovertheinfinitepotentialofone'strueBeingandthefulfilmentoflife'sgoals.

2. Course Syllabus

Unit 1(4 hours)

Causesof Stress:The problemof not beingrelaxed. Need for meditation -basics of stress management at home and workplace. Traditions and Culture. Principles of meditation– promote a sense of control and autonomy in the Universal Human Value System. Different stages of Meditation. Various Meditation Models. Various practices of Meditation techniques in different schools of philosophy and Indian Knowledge System.

Unit2(4hours)

Improvingworkandstudyperformance.Meditationindailylife.Cultivatingcompassionandgoodmentalhealth with an attitude of openness and acceptance. Research and Science of Meditation: Significance of practising meditation and perspectives from diverse fields like science, medicine, technology. philosophy, culture, arts, management, sports, economics, healthcare, environment etc. The role of meditation for stress and anxiety reductioninone'slifewithinsightsbasedonrecentcutting-edgetechnology.Theeffectofpracticingmeditation for the wholesome wellbeing of an individual.

Unit 3(4 hours)

Communications: principles of conscious communication. Relationships and empathy: meditative approach in managing and maintaining better relationships in life during the interactions in the world, role of MAOM in developingcompassion, empathyandresponsibility, instillinginterest, andorientationto humanitarian projects as a key to harness intelligence and compassion in youth. Methodologies to evaluate effective awareness and relaxationgainedfrommeditation.Evaluatingtheglobaltransformationthroughmeditationbyinstillinghuman values which leads to service learning and compassion driven research.

TEXTBOOKS:

1. MataAmritanandamayiDevi,"CultivatingStrengthandvitality,"publishedbyMata Amritanandamayi Math, Dec 2019
2. SwamiAmritaswarupanandaPuri,"TheColorofRainbow"publishedbyMAM,Amritapuri.

REFERENCES:

1. Craig Groeschel, "Winning the War in Your Mind: Change Your Thinking, Change Your Life" ZondervanPublishers, February 2019
2. RNagarathnaetal,"NewPerspectivesinStressManagement"SwamiVivekanandaYogaPrakashana

publications,Jan1986
3. SwamiAmritaswarupanandaPuri"AwakenChildrenVol1,5and7 -DialogueswithAmmaonMeditation", August 2019
4. Swami Amritaswarupananda Puri "From Amma's Heart - Amma's answer to questions raised during world tours" March 2018
5. SecretofInnerPeace-SwamiRamakrishnanandaPuri,AmritaBooks,Jan 2018.
6. MataAmritanandamayiDevi"Compassion:TheonlywaytoPeace:ParisSpeech",MACenter,April2016.
7. Mata Amritanandamayi Devi "Understanding and collaboration between Religions", MA Center, April 2016.
8. MataAmritanandamayiDevi"AwakeningofUniversalMotherhood:GenevaSpeech"MA center,April 2016.

3. Evaluationand Grading

Internal			**External**	**Total**
Components	*Weightage*		Practical(attendanceandclass participation)60%	100%
Quizzes(basedonthereading material)	20%	40%		
Assignments(Basedonwebinars andlectureseries)	20%			

4. CourseOutcomes(CO)

CO1:Relatetothecausesofstressinone'slife.
CO2:Experimentwitharangeofrelaxationtechniques CO3:Modela meditative approach to work, study, and life.
CO4:DevelopappropriatepracticeofMA-OMtechniquethatiseffectiveinone'slifeCO5:Inculcatea higher level of awareness and focus.
CO6:Evaluatetheimpactofameditationtechnique

***ProgrammeOutcomes(PO)**(AsgivenbyNBAandABET)
PO1: EngineeringKnowledge
PO2: ProblemAnalysis
PO3: Design/DevelopmentofSolutions
PO4: ConductInvestigationsofcomplexproblems
PO5: Moderntoolsusage
PO6: Engineerand Society
PO7: EnvironmentandSustainability
PO8: Ethics
PO9: Individual&Teamwork
PO10: Communication
PO11: Projectmanagement&Finance
PO12: Lifelonglearning

CO–POAffinityMap

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2		-	2	3	-	3	-	3	-	-	-
CO2	3	3	3	2	2	_	2	3	3	3	-	3	-	-	-
CO3	3	3	2	2	2	2	2	3	3	3	-	3	-	-	-
CO4	3	3	3	2	-	2	3	3	3	3	-	3	-	-	-
CO5	3	2	2	2	-	2	-	3	2	2	-	2	-	-	-
CO6	3	2	2	2	3	2	_	3	2	2	-	2	-	-	-

SEMESTER II

NUTRITIONTHROUGHLIFESPAN

SemesterII	**HoursofInstruction/week–4**
CourseCode:25FSN111	**No.ofCredits–4 Total**
L-T-P – 3-1-0-4	**60 hrs.**

Pre-requisite: Growth,Development,Demandfornutrition,Differentstagesoflife

CourseObjective:

This course will give you an on insight how nutrient needs vary during the lifespan - nutrition during preconception, pregnancy and lactation, infant nutrition, childhood and adolescent nutrition, as well as adult and older adult nutrition.

CourseOutcomes:

CO1: Applytheknowledgeofbasicsofbalanceddiet,significanceofRDAanditspurpose.
CO2: Understandthemetabolicchangesandnutritionalrequirementsduringpregnancyandlactation.
CO3: Comprehendtheknowledgeoninfantgrowthdevelopmentandnutritionalrequirements,government schemes and policies.
CO4: Gainknowledgeonphysiologicaldevelopment,nutritionalrecommendedallowances,dietarypatternof childhood and adolescents.
CO5: Understandthephysiologicalchangesanddietmodificationsduringadulthoodandelderlypopulation.

Skills:Toprovidewideknowledgeanddevelopskillinplanningthenutritionalneedsofallagegroupsby understanding their growth and development, requirements and nutritional problems.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	1	2	-	2	1	2	-	1
CO2	3	2	-	1	2	-	2	2	2	-	1
CO3	3	2	-	1	2	-	2	2	2	-	1
CO4	3	2	-	1	2	-	2	2	2	-	1
CO5	3	2	-	1	2	-	2	2	2	-	1

Syllabus:

UnitI:IntroductiontoRDAandBalancedDiet **12 hrs.**

Basics for Recommending the Dietary Allowances, Acceptable Dietary Intake, Purposes of RDA, Factors AffectingRecommended DietaryAllowances, Requirements and RecommendedDietaryAllowances, Growth chart, Uses of ICMR RDA in planning balanced diet, Consumption Units. Reference Man and Woman, Food and Nutritional Requirements for Adults doing Different Activities.

UnitII:MaternalNutrition **12 hrs.**

Nutrition in Pregnancy: Maternal nutrition and outcome, Importance of pre and periconceptional nutrition during pregnancy; Pre pregnancy weight and fetal outcome. Fetal weight gain. Nutritional assessment and guidance in prenatal care. - Physiological changes during pregnancy, expansion in blood volume, hormonal profile inpregnancy, organfunctions, placentaltransferof nutrientsandresultingcomplicationsinpregnancy. Other nutritionrelatedconditions; pregnancyinobesewomen, gestational diabetes,preeclampsia,alcohol and caffeine abuse. - Maternal nutrient metabolismand recommended intakes in pregnancy. Maternal weight gain

inpregnancy. Intrauterine growthretardation.Highriskpregnanciesandcommon concernsduringpregnancy. Importance of antenatal care.

NutritioninLactation: Nutritionalneedsforlactation.Breastfeedingbiology,Psycho-physiologicalaspects of lactation. Factors affecting lactation capacity. Management of lactation, exclusive breast feeding, Breast support and counseling. Effect of breast feeding on maternal health.

UnitIII:NutritionforInfant **12 hrs.**

Infantgrowthandphysiologicaldevelopment.Norms/standardsforgrowth.Growthmonitoringandpromotion. Failuretothrive.Infantnutritionalneedsandconcerns.Nutritionandbraindevelopment.Infantfeeding,volume and composition of breast milk, human milk Vs. artificial formula. -Development and nutritional quality of infantfood:Moderninfantformula,complementaryandsupplementaryfeeding.Dietarymanagementissuesin infant feeding. Food allergies in infancy. -Preterm and LBW infants: Consequences, implications for feeding and management. Neonatal infant mortality and child mortality, IMR. Government policies, schemes and entitlements.

Unit IV: Nutrition in Childhood and Adolescence **12 hrs**

Childhood:Growthanddevelopment,physiologicaldevelopment.Nutritionalneedsandfeedingforpreschool children. Micronutrient malnutrition among preschool children. Child health, morbidity, mortality and under fivemortalityrate(U5MR).-NutritionalrequirementsandRDA.Feedingschoolchildren,behavioral characteristicsandfeedingproblems.Dietarypatterns,planningaschoollunch,factorstobeconsidered. Implications of childhood obesity and other nutritional concerns. Healthy food choices during childhood.

Adolescence: Growth during adolescence, nutritional requirements, hormonal influences, age of menarche-factors affecting, physiological problems and nutritional issuesinadolescence. Government policies, schemes and entitlements

Unit V: Nutrition for Adulthood and Old age **12 hrs.**

Nutritional requirements for adult man and woman. Nutritional concerns and diet. Nutrition and work efficiency. -Physiological changes in aging, effects of aging on nutritional health of elderly. RDA, nutritional guidelines. Modification in diet, feeding old people. Nutritional concerns in old age and their management. Government policies, schemes and entitlements

ReferenceTextbooks:

1. Srilakshmi,N.,9thEdition,Dietetics,NewAgeInternationalPrivateLtd.,NewDelhi,2023.
2. KrauseandMahan'sFoodandtheNutritionCareProcess,16thEdition,JaniceLRaymond&Kelly Morrow, 2023.
3. ChernoffR.GeriatricNutrition,TheHealthprofessionalsHandbook.4thEdition,JonesandBartlett Learning, Burlington. 2013.
4. EdelsteinSandSharlinJ.LifeCycleNutrition:AnEvidenceBasedApproach,JonesandBarlett publishers, USA. 2009.
5. GhaiOP.EssentialPediatrics,2ndedn,Interprint,NewDelhi.1990.
6. JohnEMandDavidRT.GeriatricNutrition.CRCPress.Taylor&Francisgroup.BocaRaton.2007.
7. KathleenMLandEscottS.Krause'sFood,NutritionandDietTherapy,16th edn,W.B.Saunders Company Pennsylvania. 2024.
8. MahtabS.Bamji,KamalaKrishnaSwamyandGNVBrahmam.TextbookofHumanNutrition. Oxford and IBH Publishing, New Delhi. 2009.

SuggestedReadings:

ParkK.TextBookofPreventiveandSocialMedicine.21stedn,BanarsidasBhanotPublishers,Jabalpur,India.2011.

1. ShillsME,OlsonJA,MosheSandRoss CA.ModernNutritioninHealthandDisease,9thedn,Lippincott Williams and Wilkins. 2006.

2. SethV andSinghK.Diet planningthroughlifecycle:Part1.Elitepublishinghousepvt ltd,NewDelhi. 2006.

3. SmolinandGrosvenor.NutritionScienceandApplications,3rdedn,SaundersCollegePublishing, Philadelphia. 2000.

EvaluationPattern:

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

HUMAN PHYSIOLOGY

Semester:II	**HoursofInstruction/week–4**
CourseCode:25FSN112	**No.of Credits–4**
L-T-P – 3-0-1-4	**Total60 hrs.**

Pre-requisite: Basicbiology,Humanbody,Organsandsystems,functions.

CourseObjectives:
Toprovidekeenknowledgeonphysiologicalconceptsofhomeostasisandcontrolmechanismsandtostudytheanatomy and physiology of body systems. The course also provides practical sessions and tutorials.

CourseOutcomes:
CO1:UnderstandtheCompositionandFunctionsofblood,heartandmechanismofcirculatorysystem. CO2: Comprehend the structure and functions of respiratory systems and excretory system.
CO3:Understandtheanatomyandphysiologicalmetabolismofthedigestiveandmusculosketalsystem.
CO4:Gaintheknowledgeonanatomyandphysiologyofendocrineandreproductivesystemsofmaleandfemale. CO5: Gain fundamentals on structure and functions of nervous system and sense organs.
Skills: Developskillstoassessphysicalandclinicalsymptomsbasedonthephysiologicalchanges

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	1	-	-	2	2	1	2	-
CO2	2	-	-	1	-	-	2	2	1	2	-
CO3	2	-	-	1	-	-	2	2	1	2	-
CO4	2	-	-	1	-	-	2	2	1	2	-
CO5	2	-	-	1	-	-	2	2	1	2	-

Syllabus:

UnitI-Blood,HeartandCirculation **11hrs.**

Blood -Composition, functions, RBC – Structure, functions, erythropoiesis, Haemoglobin, WBC – Structure, functions, Classification.

Blood Platelets - Structure, functions, Reticulo endothelia system, Blood groups – Rh factor. Blood coagulation, spleen –Structure and functions, Lymph and Lymphatic system.

HeartandCirculation-Heart–Anatomyandphysiology,Bloodvessels–Structureofartery,vein,capillaries, Cardiacoutput,Arterial Blood pressure,clinical measurement ofbloodpressure,propertiesof cardiac muscle, origin and conduction of heart beat, cardiac cycle, Regulation of the Heart's action.

UnitII-RespiratoryandExcretorySystem **11hrs.**

Respiratory System - Structure of respiratory organs, Mechanics of respiration, subdivisions of lung air, Chemistry of respiration. Artificial respiration, control of respiration, oxygen saturation, pulsoximeter.

Excretory System -Structure of Excretory System. Kidney, Nephrons, Urine Formation Composition of Urine, Micturition.

Unit III - Digestive System and Musculoskeletal System **11 hrs.**

Digestive System - General anatomy of digestive system – Digestive in the mouth, stomach and intestines. Movements of small intestine. Role of pancreas, Liver – Structure and function.

Musculoskeletal System: General Anatomy of Muscular system-Functions of muscles, Ligaments, Tissues, Skeletal system, Bones and Joints

Unit–IV-EndocrineandReproductivesystem **11hrs.**

Endocrinology - Structure and functions of thyroid, pituitary, parathyroid, adrenals, islets of Langerhans of pancreas, sex glands.

Reproductive System - Anatomy of Male and Female Reproductive Organs, Physiology of Menstruation, PregnancyandAssociatedChanges,Placenta,mammaryGlandand Lactation-Structure,lactationandprocess of reproduction, fertilization, development of embryo, pregnancy and parturition.

Unit V - Nervous System and Sense Organs **11hrs.**

Nervous System:

Spinalcord-Structureandfunctions.Ascendinganddescendingtracts,reflexaction.

Brain-Structureandfunctionsofcerebrum,opticthalamus,midbrain,ponsmedullaoblongata,Hypo thalamus, cerebellum.

Autonomicnervoussystem,sympatheticandparasympathetic.

SpecialSenses.

Eye -Physiology of vision, Structure of eye, dark and light adaptation, accommodation of the eye, visual fields, common problems due to abnormalities – presbyopia, cataract, Astigmatism, Blindness.

Ear – Structure and Physiology.

Nose- Structure and Physiology

TongueStructureandPhysiology.

Demonstration **5 hrs**

1. Bleedingtime
2. Clottingtime
3. Identificationoftissues
4. Bloodgroups–identification
5. MeasurementofHemoglobin
6. MeasuringPulseRate
7. MeasuringBloodPressure
8. Measurementofheight,weightandcalculationofBMI
9. Physicalfitnesstest

TextBooks:

1. ChatterjeeC.C(2016),HumanPhysiology11th Edition,MedicalAlliedAgency,Kolkata
2. Sembulingam,K.(2012)EssentialsofMedicalPhysiology,6th Edition,JaypeeBrothersMedical Publishers (P) Ltd., New Delhi.
3. SathyaNarayana,EssentialsofBiochemistry(2000)
4. SarathaSubramanian,TextofHumanPhysiology(2000).
5. StuartIraFox,HumanPhysiology(2015)

ReferenceBooks:

1. BestandTaylor,(2011)13th EditionThePhysiologicalBasisofMedicalPractice, Saunders Company.
2. Chaudhri,K.(2016)7th EditionConciseMedicalPhysiology,NewCentralBookAgency(Parentral) Ltd., Calcutta.

EvaluationPattern:

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODPROCESSINGANDPRESERVATION–II

SemesterII	**HoursofInstruction/week–4**
CourseCode:25FSN113	**No.of Credits–4**
L-T-P – 3-1-0-4	**Total60hrs.**

Pre-Requisite: Techniquesinvolvedinfoodprocessingandpreservation

CourseObjectives:

1. Togivebetterunderstandingontheimportanceoffoodpreservation.
2. Torelatebetweendifferenttypesoffoodspoilage
3. Toapplytheuseofdifferenttemperaturesinfoodprocessing
4. Tocomparethepreservationofvariousfoodsusingsugar,chemicalsandsalt
5. Toofferknowledgeontheprinciplesandconceptoffoodfermentation

CourseOutcomes:

CO1:Understandthebasicprinciplesandimportanceoffoodprocessingpreservation.
CO2:Gainknowledgeonfoodprocessingandpreservationmethodsusinghightemperature.
CO3: Comprehendlearningonmethodsoffoodpreservationusingirradiationandadvantagesofmicrowaveheating. CO4: Gain better understanding on food preservation using low temperature methods.
CO5:Acquireknowledgeonthefoodprocessingandconversionoperations.

Skills:

1. Developskillsinfoodpreservation
2. Developnewproductswithminimalprocessingforbetterretentionofessentialnutrients

COPOMappings:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2	-	-	-	1	1	-	2	-
CO2	2	2	1	-	-	-	1	1	-	2	-
CO3	2	2	2	-	-	-	1	1	-	2	-
CO4	2	2	2	-	-	-	1	1	-	2	-
CO5	2	2	1	-	-	-	1	1	-	2	-

Syllabus:

Unit I - Introduction to High and Lowtemperature Food Processing and Preservation 12hrs.
Definitionoffoodprocessing,principlesandsignificanceofhightemperaturepreservation,factorsaffecting thermal death time, principles and types of spoilage, commercial heat preservation method.

Unit II – Food Processing and Preservation using Evaporation and dehydration 12hrs.
Principlesofdrying,typesofevaporation,methodsofdrying,effectofdehydration,factorsaffectingdrying, operation of evaporation process and changes during drying.

Unit III - Preservation by Irradiation and Microwave Heating 12hrs
Unitsofradiation,mechanismofactionofradiation,effectsonfoods,effectonmicro-organism,irradiation process, mechanism of microwave heating, advantages and its applications.

Unit IV – Food Processing and Preservation by Using Low Temperature **12hrs**

Differentlowtemperaturemethods,microbialactivityatlowtemperature,refrigerationandcoolingmethods, freezing and frozen storage, packaging requirements, hazard analysis, thaw indicators.

Unit V – Food Processing and Conversion Techniques **12hrs**

Size reduction, mining, emulsification, filtration, membrane filtration, centrifugation, expression, crystallization, heat processing.
IndustrialVisit

Relatedpracticalexperiences

1.Visitto foodprocessing units

TextBooks:

5. ShakuntalaManay,N.andShadaksharaswamy,M.,(2023)Foods–FactsandPrinciples,5th Edition, New Age International (P) Limited Publishers, New Delhi, 2013.
6. G.SubbulakshmiandShobaAUdipiFoodProcessingandpreservation,NewAgeInternational Publishers, New Delhi, 2nd edition, 2022.
7. SivasankarB,(2022)FoodPreservationandProcessing,1stEdition,Prentice–HallofIndia Private Ltd., New Delhi.
8. ModernFoodMicrobiology,JamesM.Jay,(2006),7thEdition,CBSPublishersandDistributors, New Delhi.

ReferenceBooks:

5. Fellow,P.,FoodProcessingTechnology(2016)–PrinciplesandPractices,3rdEdition,CRC Press Woodland Publishers, England.
6. Adams,M.R.andMoss,M.O.,FoodMicrobiology,(2015)NewAgeInternational(P)Ltd., New Delhi.
7. Sommers,C.H.andXvetengFan,(2016)FoodIrradiationResearchandTechnology,2nd Edition, Blackwell Publishing, New Delhi.
8. ManualofmethodsofAnalysisoffoods,fruitandvegetableProcessing, FSSAI,2016.

EvaluationPattern:

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODCHEMISTRY

SemesterII	**HoursofInstruction/week–3**
CourseCode:25FSN114	**No.ofCredits–3**
L-T-P –3-0-0-3	**Total45 hrs.**

Prerequisite: Basicsofchemistry-water,carbohydrates,proteinsandfats.
Courseobjective:

Toprovideadeeperknowledgeonthechemicalconstituents,theirstability,changes-indifferentmediumand their applications

Courseoutcomes:
CO1:Gainclearunderstandingoftheinteractionofwaterwithfoodandtheroleofwaterinfood CO2:
Understand the chemistry of sugars and starch and their contribution in the foods
CO3:Gainknowledgeonthetypesofproteins,propertiesandtheactionofchemicalsonit. CO4:
Recognize the characteristics of fats and oils
CO5:Familiarizewiththepigmentsinfood,spicesandcondiments,enzymesadditivesandtoxicsubstances.

Skills: Developskillsinthechemistrybehindfoodsduringprocessing

CO-POMapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	1	-	-	-	-	-	-	-	-	-
CO2	-	2	-	-	-	-	-	-	-	-	-
CO3	-	1	-	-	-	-	-	-	-	-	-
CO4	-	1	-	-	-	-	-	-	-	-	-
CO5	1	1	-	-	-	-	-	-	-	-	-

Syllabus:

UnitI:Sols,GelsandSolutions **9 hrs**

MoistureinFoods,HydrogenBonding,BoundWater,Waterandits interactionwithfoodcomponents andfoodstability,WaterActivityinFoods,DeterminationofMoistureContentinFoods,TrueSolutions, Dispersions, and colloidal solutions.

UnitII:Carbohydrates-ChemicalpropertiesforFoodApplications **9 hrs**

Carbohydrates-Starch-granulestructureandproperties,nativeandmodifiedHeteropolysaccharides -pecticsubstancesandseedgums,Sweeteners,EffectofSugar,Acid,Alkali,FatandSurface-ActiveAgentsonStarch, Chemistry of Milk Sugar, Non Enzymatic Browning, Swelling of Starch Granules, Gel Formation, Retrogradation, Syneresis.

UnitIII:Proteins-ChemicalpropertiesforFoodApplications **9 hrs**

Proteins - Amino acid chemistry, Protein structure, Components of Wheat Proteins, Structure, GlutenFormation Effect of Soaking, Fermentation and Germination on Pulse Proteins. Properties of Egg Protein, Chemistry of Milk Protein, Changes in Milk, Egg and Meat Proteins during Heating, Action of Heat, Acid, Alkalis on vegetable Proteins and animal Proteins.

UnitIV:FatsandOils-ChemicalpropertiesforFood Applications 9 hrs

Lipids-Fattyacidsandtriglycerides,Phospholipids,PhysicalandChemicalPropertiesofFatsandOils,Lipidoxidation -Rancidity, hydrolytic and oxidative Hydrogenation - mechanisms and catalysts, Winterization, Decomposition of Triglycerides, Shortening Power of Fats, Changes in Fats and Oils during Heating, Factors affecting fat absorption in foods

UnitV:ChemistryofPecticSubstances,PlantPigments,Spicesandcondiments9hrs

Pectins, Phenolic Components, Enzymatic Browning in Fruits and Vegetables, Volatile Compounds from Cooked Vegetables, DifferentTypes of Plant Pigments –Water-and Fat-SolublePigments, Propertiesand Active Principlesof Spices and Condiments, Colours and colorants, Food additives, Flavours, Acid -base chemistry of foods and common additives,Toxicsubstances.

Textbooks

1. ShakuntalaManay,Shadaksharaswamy.M(2017)Foods,FactsandPrinciples,NewAgeInternational Pvt Ltd Publishers, 2nd Edition

2. Chandrasekhar,U.FoodScienceandapplicationsinIndianCookery(2002)PhoenixPublishingHouse, New Delhi. 3. Swaminathan, M. Food Science, (2015) Chemistry and Experimental Foods, Bappco Publishers, Bangalore

References

1. Meyer, L.H, Food Chemistry, (2004) CBS Publishers and Distributors, 4th edition
2. Paul,P.C.andPalmer,H.H.FoodTheoryandApplications(2000)JohnWileyandSons,NewYork, (Revised Edition)
3. Chopra H.K, Panesar, P.S, Food Chemistry (2010) Narosa Publishing House, New Delhi
4. "Fennema´sFoodChemistry"4thed.Damodaran,Parkin&Fennema(2008),CRCPress,Boca Raton, USA

Evaluationpattern

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

NUTRITIONTHROUGHLIFESPANPRACTICAL

SemesterII	**HoursofInstruction/week–3**
CourseCode:25FSN182	**No.ofCredits–1**
L-T-P – 0-0-3-1	**Total45 hrs.**

Prerequisite: StagesofHumandevelopment,Food&NutritionalRequirements

CourseObjectives:

1. Torelatefoodsandnutrientstothebiologicalrequirementsofhumansatdifferentstagesofthelifecycle.
2. Todescribenutrition-relatedconcernsspecifictoeachstageofthehumanlifecycletoconsequencesfor health and disease.
3. Relatetheroleofadietitianindietplanningandhomemakerinfamilymeal planning

CourseOutcomes:

1. Applyknowledgeontheskillsinplanningbalanceddietforallagegroups.
2. Applyknowledgeontheskillsinplanningbalanceddietforspecialpopulationlikepregnancy, lactation and old age.

Skills: Developskillsinplanningandevaluatingmenuplansthroughoutdifferentstagesoflifespan

CO-POMapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	-	1	-	1	3	1	2	1
CO2	2	3	-	-	1	-	1	3	1	2	1

Practical: **45hrs.**

	NUTRITIONDURINGINFANCY,CHILDHOODANDADOLESCENCE
1	Formulationandpreparation ofweaningfood
2	Menuforapreschool Child (1-3years)
3	Menuforaschoolgoingchild(4-6years)
4	MenuforanAdolescent girl (10-12years)
5	MenuforanAdolescentboy(13-15years)
6	Menuforanadolescent boy(16-18years)
7	MenuforanAdolescent girl (16-18years)
	NUTRITIONDURINGADULT,OLDAGEANDSPECIAL CONDITION
8	Menuplanforadult mandoingmoderatework
9	Menuplan foradultman doingsedentarywork
10	Menuplan foradultmandoingheavywork
11	Menuplanforadult woman doingmoderatework
12	Menuplanforpregnantwomandoingsedentarywork
13	Menuplan for lactatingwoman doingheavywork
14	Menuplanforaold ageman doingsedentarywork
15	Menuforan oldagewoman doingsedentarywork

Referencebooks:

1. DietaryGuidelinesforIndians,ICMR,NationalInstituteofNutrition,Hyderabad,2024.
2. Gopalan,C.RamaSastriB.V.andBalasubramanian,NutritiveValueofIndianFoods, NIN,ICMR, Hyderabad, 2017.
3. Srilakshmi,B.,Dietetics,NewAgeInternational(P)Ltd.,NewDelhi,9th edition,2023.
4. Swaminathan,M.,AdvancedTextbookonFoodandNutrition,Vol.1,SecondEdition,Bangalore Printing and Publishing Co. Ltd., Bangalore, 2012.

EvaluationPattern:

Internal	External	Total
80	20	100

*CA–Regular Labworkassessment

FOODPROCESSINGANDPRESERVATIONPRACTICAL

SemesterII	**Hoursof Instruction/week–3**
CourseCode:25FSN183	**No.ofCredits–1**
L-T-P – 0-0-3-1	**Total45 hrs.**

Prerequisite: Foodpreservation,cookingmethods

CourseObjectives:

1. Tounderstandthefundamentalsoffoodpreservationandprocessingmethods,emphasizingthe importance of food safety and quality.
2. Toexploretheprinciplesandtechniquesofsugarpreservationmethodsandtheirapplicationsin extending shelf life.
3. Toexaminetheprinciplesandapplicationsofsaltpreservationmethodsandtheireffectivenessin maintaining food quality and safety.

CourseOutcome:

CO1:Demonstrateacomprehensiveunderstandingofthefundamentalconceptsoffoodpreservationand processing methods, with a keen emphasis on ensuring food safety and quality

CO2:Applytheprinciplesandtechniquesofsugar preservationmethodsandprolongtheshelflifeof various food products.

CO3:Evaluatetheprinciplesandapplicationsofsaltpreservationmethodsandassesstheirefficacyin preserving food quality and safety standards.

Skills:
Developfoodprocessingandpreservationskillsforproductdevelopment.

CO-POMapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO01	2	2	-	-	1	-	2	2	2	2	-
CO02	2	2	-	1	1	-	2	2	2	2	-
CO03	2	2	-	-	1	-	2	-	2	-	-

Practical **45hrs.**

S. No	TitleofExperiments	CourseOutcome
IntroductiontoFoodPreservation&processingmethods		
1	SpecificationsuggestedbyFSSAI–Specification of fruit beverage	CO01
2	PreservationbydifferentDryingMethods	CO01
3	ProcessingbydifferentBlanchingMethods	CO01
4	PreservationbydifferentColdtreatment methods	CO01
SugarPreservationMethods		
5	PreservationofJam	CO02
6	PreparationofJelly	CO02
7	PreparationofSquash	CO02
8	PreparationofRTSbeverages	CO02
9	PreparationofCandies&FruitLetherbar	CO02
SaltPreservationMethods		
10	PreparationofKetchup&Sauce	CO03
11	PreparationofVadam&Vathal	CO03
12	PreparationofPickles	CO03

Textbooks:

1. SrivastavaR.P.Fruitandvegetablepreservation–PrinciplesandPractices,InternationalBook Distributing Co., (IBDC), New Delhi.2013

References:

1. MariaParloa(2012),Cannedfruit,preservesandjellies:Householdmethodsofpreparation,Publishedby US department of Agriculture, Washington.

2. M.Shafiur,Rahman(2017),Handbookoffoodpreservation2ndEdition,CRCpress,USA.

EvaluationPattern:

Internal(CA)	External	Total
80	20	100

CA–RegularLab Work Assessment

FOODCHEMISTRY PRACTICAL

SemesterII	**Hoursof Instruction/week –3**
CourseCode:25FSN184	**No.of Credits–1**
L-T-P – 0-0-3-1	**Total45hrs.**

Pre-requisite: Chemistrybehindfoods,Effectsofcooking,changesduringcooking

CourseObjectives:

1. ToenablethestudentstoStudythephysio-chemicalchangesthatoccurinfoodsduringcooking.
2. ToGainknowledgeaboutthechemistryunderlyingthepropertiesandreactionsofvariousfoodcomponents.
3. ToUnderstandthevariouspropertiesexhibitedbystarchandsugars,proteins,fatsandoils,pecticsubstancesand spices and condiments

CourseOutcomes:

CO1:Demonstrateproficiencyinunderstandingphysiochemicalchangesoccurringinfoodsduringcooking.
CO2: Describe the basic principlesand propertiesofstarch proteins, fatsand oils, pectic substances and spices andcondiments.
CO3: Gainsufficient knowledge aboutchemistryof starch proteins,fatsand oils, pecticsubstances.

Skills: Developproducts with minimumnutritionalloss basedontheknowledge of foodchemistry.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	-	-	3	-	1	-	-	2	-
CO2	2	1	-	-	3	-	1	-	-	2	-
CO3	2	1	-	-	3	-	1	-	-	2	-

Practicals: **45hrs.**

1. Dispersion,Colloids,Emulsions,Sols,Gels,etc
2. MicroscopicExaminationofuncookedandgelatinizedStarch
3. EnzymaticBrowning&NonEnzymaticBrowing
4. RetrogradationandSyneresis
5. Scumformation
6. Boilingoverandscorchingofmilk
7. EffectofSoaking,germinationandfermentationofPulses
8. OverboilingofEggsandformationofHydrogensulphide
9. Mayonnaise-Emulsion
10. SmokingTemperatureofDifferentFats,FactorsAffectingAbsorptionofFats
11. Waterproperties
12. PH,Acidity,ofvariousfoods
13. ColoursandFoodAdditives

TextBooks:

1. ShakuntalaManay,Shadaksharaswamy.M(2017)Foods,FactsandPrinciples,NewAge InternationalPvtLtd Publishers, 2nd Edition
2. Chandrasekhar,U.FoodScienceandapplicationsinIndianCookery(2002)PhoenixPublishingHouse,New Delhi
3. Swaminathan,M.FoodScience,(2015)ChemistryandExperimentalFoods,BappcoPublishers,Bangalore.

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1. Meyer,L.H,FoodChemistry,(2004)CBSPublishersandDistributors,4th edition
2. Paul,P.C.andPalmer,H.H.FoodTheoryandApplications.(2000).JohnWileyandSons,NewYork.
3. ChopraH.K,Panesar,P.S,FoodChemistry(2010)NarosaPublishingHouse,NewDelhi.

EvaluationPattern:

Internal(CA)	External	Total
80	20	100

*CA–RegularLabworkassessment

24ENG111	EnglishII	1 0 2 2

Objectives:

To train students to convey and document information in a formal environment; to facilitate them to acquire the skill of self-projection in professional circles; to inculcate critical and analytical thinking.

Cos	Course Outcomes
CO 1	Illustrate comprehensionofthefundamentalsofwriting
CO 2	AnalyseaudiotextfocussingonEnglishphonetics,pronunciationand meaning comprehension
CO 3	Applytheoreticalknowledgetowriteprofessional documents
CO 4	Inferfromcurrentnewstoformulateideasandopinions
CO5	Prepareappropriatecontentforminiprojectandmake effective presentation

Unit I

Vocabulary Building: One-word substitutes; Antonyms and Synonyms; Words often Confused Error Analysis (Subject-Verb Agreement; Tense Sequence; Usage of Articles and Prepositions; Determiners; Redundancy); Modifiers (misplaced**,** dangling, etc.)

Unit II

Circulars; Memos; Formal Letter writing; e-Mail Etiquette; Instruction, Suggestion & Recommendation; Essay writing: Analytical and Argumentative

Unit III

SoundsofEnglish:Stress,Intonation-ListeningComprehension(3pieces–WomeninTechnology Panel discussion, India Questions Abdul Kalam, UPSC Topper Mock interview Akshat Jain) - Current News Awareness

Unit IV

Reports:Incident Report, Event Report

SituationalDialogue;GroupDiscussion(Opinion)

Unit V

MiniProjectandPresentation

References:

1. FelixaEskey. *TechTalk*,Universityof Michigan.2005
2. MichaelSwan.*PracticalEnglishUsage*,OxfordUniversityPress.2005
3. Anderson,Paul.*TechnicalCommunication:AReaderCenteredApproach*, V Edition, Hercourt, 2003.
4. Martinet,Thomson,*APracticalEnglishGrammar*,IVEd.OUP,1986.
5. RaymondV.LesikarandMarieE.Flatley.*BasicBusinessCommunication*,Tata McGraw Hill Pub. Co. New Delhi. 2005. Tenth Edition.

6. Thampi,G.Balamohan.*Meetingthe World: WritingsonContemporaryIssues*.Pearson,2013.
7. Lynch, Tony.*StudyListening*.NewDelhi:CUP,2008.
8. Kenneth,Anderson,TonyLynch,JoanMac Lean.*StudySpeaking*.NewDelhi: CUP,2008.

9. Marks,Jonathan.*English Pronunciationin Use*.NewDelhi:CUP, 2007.
10. Syamala, V. *Effective English Communication forYou (Functional Grammar, Oral and Written Communication)*: Emerald, 2002.
11. SampleQuestionPapersfromCompetitiveExaminations
12. Women in Technology Panel discussion
https://youtu.be/T44XdGH5s-8?si=A1cDVEt777FH7vFR

13. India Questions Abdul Kalam
https://youtu.be/erg3CmVm6M4?si=WjP_SV1vy6FrsGHg

14. UPSC Topper Mock interview, Akshat Jain
https://youtu.be/lsJBGvyiAHI?si=L-u6kTadzJmghHLI

24MAL111	MalayalamII	2 0 0 2

Course objective:

- Todevelopindependentreadingskillsandreadingforappreciatingliteraryworks.
- Todevelopelaborationandmodernizationofthevocabularyofalanguage
- Toenablethestudentstoplan,draft,edit&presentapieceofwriting.

Course outcomes:

CO1:Developtheabilitytoreadandcriticallyappreciateagiventext
CO2:Develop fluency in communication
CO3: Develop interest in blending of language and Indian Spirituality
CO4: To enable the learners to understand the grammatical structures of classes of words

UnitTopic

1 Memoirs-One of theSelecrtionfromChiudambara Smarana-Balachandran Chullikkadu-Critical analysis of his poetry)
2 AncientDrama:KeralaSakunthalam(Act4),Kalidasan(TransilatedbyAttoorKrishna Pisharody).
3 SatireOneoftheSelectionfromChemmanamChacko,VKNOrPunathilKunjabdulla- philosophical dimens of Satire
4 Partofanauto-biography/travelogue:
Valarnnuvarunnaoratmavu(fromKanneerumKinavum)-VTBhattathirippad
5 Error-freeMalayalam: 1.Language; 2.Clarity of expression; 3.Punctuation-Thettillatha Malayalam – Writing-a. Expansion of ideas

Text books/Reference:

1) HasaSahithyamKuttikrishnaMararu
2) Sakunthalam-Attoor/KuttikrishnaMarar
3) KalidasaHridayam-K.P.NarayanaPisharady
4) VKN-K.P.Appan
5) N.V.KrishnaWarriar&ModernPoetrystudies
6) KanneerumKinavum–V.T.Bhattathirippad
7) AdukkalayilNinnuArangatheykku-V.T.Bhattathirippadu
8) NallaMalayalam-C.V.VasudevaBhattathiri
9) TettumSariyum-Prof.PanmanaRamachandranNair

24HIN111	HINDI II	2 0 0 2

CourseObjective: Thecoursewillallowstudentstoapplygrammar inlanguagestructures,appreciate the literary compositions and provide them with a good command over translation techniques.

Courseoutcomes: Bytheend ofthecoursethe students will beable to:

1. Understandthepostmoderntrendsof literature...
2. Exploretraditionandculturethroughliterature.
3. Applyethicalandprofessionaltranslationstrategies.
4. Demonstratelinguisticcompetenceinwrittencommunication.

UNIT1

HindiLaghuUpanyas**:MamathaKaliya-'Doud' UNIT 2**

HindiNatak**:**SwadeshDeepak-"KortMarshal"

UNIT3.

Adhunik Hindi Kavyaa.Jayashankar Prasad-(Lahar, Aah!VedhanaMili Vidayi)., b.Suryakanth Tripathi „Nirala"- (Anamika -4)., c.Subadhra Kumari , Chouhan- (Swadesh Ke Prathi, Smruthiyam), d.Gajanan Madhav Muktibodh- (ek swapna Katha)

UNIT4.

A) Sankshepan,

B) .Anuvad: Paribhasha,Prakar,AnuvadKeLakshan,AnuvadKiAvashyakata,Passage (Translation)

c)Paragraph writing

D)Technicalwriting

REFERENCE

1. PrayojanMulakHindiKeNayeAyam :Dr.PanditBanne
2. PrayojanMulakHindiKiNayiBhumika :KailashNathPandey
3. PrayojanMulakHindiKeVividhRoop :Dr.RajendraMishra,Rakesh Sharma
4. "AdhunikKavyaSangraha" Editedby.Dr.UrvashiSharma(PrintedandPublishedbyMalik& Company, Jaipur)
5. HindiSamay.com,/Hindikahani.com/exoticindiaart.com

24KAN111	KannadaII	2

Objectives:

- Todevelopthestandard oforthographyandspelling system.
- Todevelopindependentreadingskillsandreadingforappreciatingliteraryworks.
- Todevelop elaborationand modernizationofthe vocabularyof a language.
- Toenablethestudents toplan,draft, edit&present apieceofwriting.

Course Outcome

CO1	Developtheabilitytoreadandcriticallyappreciateagiventext
CO2	Developpatternofcommunicationasrequiredfordifferentprofessional context
CO3	Develop fluencyin speakingthelanguage

CourseContents

UNIT – 1

Prabandhagalu

- Thotadacheya Bhoota– Kuvempu
- BantuBannadaHoli –G. S. Shivarudrappa

UNIT–2

Poems

- Nihinganodabayda Nanna–Da.Ra.Bendre
- Huttarihaadu–PanjeMangeshRao
- Tungabadre–K.S.Narasimhaswamy
- NannaJanagalu –Dr.Siddhalingaya

UNIT–3

Novel

- JugariCross–Poornachandra Tejaswi

UNIT–4

- Suttole
- Kadata
- prakatane
- Arjigalu
- Aadeshapatraa

UNIT-5

- Varadigalu
- SanshikptaBaravanige
- Prabandhagalu:vaadaatmakahaaguvishleshanatmaka

References:

1. JugariCross–PoornachandraTejaswi–Pustaka Prakashana
2. ShatamaanadaLalithaPrabandha –GurulingaKaapase- KarnatakaSahityaAcademy
3. N.GopalkrishnaAdiga–KannadaVyakaranamattuRachane–MCCPublications
4. MaadhariPatragalu–S.R.Siddharaju–KannadaSaahityaParishattu
5. H.S.KrishnaswamyIyangar–AdalithaKannada–Chetanapublication,Mysuru

24SAN111	SANSKRITII	2 0 0 2

ModuleI

Sevencases,Avyayas, sentencemakingwithAvyayas,Sapthakakaras.

ModuleII

KthavathuPrathyaya,Upasargas,Kthvatha,Thumunnantha,LyabanthaPrathyaya.Three Lakaras – brief introduction, Lot lakara

ModuleIII

Newwordsandsentencesforthecommunication,Slokas,moral stories,Subhashithas,riddles (Selected from the Pravesha Book)

ModuleIV

Introductiontoclassicalliterature,classificationofKavyas,classificationofDramas- Important five Mahakavyas

ModuleV

Translationofparagraphs fromSanskrittoEnglish andvice versa

ModuleVI

ChanakyaNeetichapterIII(PartII), BhagavadGeetachapter14(PartII)

Essential Reading:

1,Praveshaha;Publisher:Samskritabharati,Aksharam,8th cross,2nd phase,girinagar, Bangalore -560 085
2,SanskritReaderI, IIandIII,R.S.VadhyarandSons,Kalpathi,Palakkad 3,
PrakriyaBhashyam written and published by Fr. John Kunnappally
4,SanskritPrimerbyEdwardDelavanPerry,publishedbyGinnandCompanyBoston 5,
Sabdamanjari, R.S. Vadyar and Sons, Kalpathi, Palakkad
6, NamalinganusasanambyAmarasimhapublished byTravancoreSanskritseries
7,SubhashitaRatnaBhandakarabyKashinathSharma, published byNirnayasagarpress

24TAM111	TAMILII	2 0 0 2

CourseObjective: Thecoursewillallowstudentstounderstandthewritingcompetencyin Tamil literature.

Courseoutcomes: Bytheend ofthecoursethe students will beable to:

1. IntroductiontoTamil Folklore
2. LearningthenuancesofTamilspiritualliterature
3. ExposuretotheadvancedaspectsofTamil grammar
4. Imbibing the spirit of language through familiarising with linguistics, translation and creativewriting

அலகு1

சிற்றிலக்கியங்கள்அறிமுகம்: கலிங்கத்Fப்பரணி (பதபார்தபாடியF), முக்கூைற்பள்ளு 35. தநாைடுபுறவியல்: வரரவிலக்கெம், தநாைடுபுறப்தபாைல்கள், கரதகள், கரதப்தபாைல்கள், பழமதமாழி, விடுகரதகள், கரலகள்.

Introduction to CiRRilakkiyam: Kalingaththupparani (Poor Padiyathu) - MukkdaRpallu 35. Folklore: Definition, Folksongs - Stories – kathaipPaadal - pazhamozhi - vidukathai - kalaikaL.

அலகு2

பக்திஇலக்கியம்:ஐதாள்முழுவரதலாறு,திருப்தபாரவ(1,2,3,4)

அலகு3

மததால்தகாப்பியம்:மதபாருளிலக்கெம்-தமால்லிலக்கெம்

அலகு 4

மதமாழிமபயப்பு: மதமாழிமபயப்புவரகள், மதமாழிமபயர்ப்பின்முக்கியFவமும்பதரவயும், இயந்திரமதமாழிமபயர்ப்பு, மதகாள்ரகள், இலக்கியமதமாழிமபயர்ப்பு. மதமாழியியல்அறிமுகம்: மதமாழியும்மதமாழியியலும், பயன்தபாடுமதமாழியின்தன்ரமகள் ,மதமாழியியல்Fரறகள். பரைப்புஉருதவாக்குதல் (கருத்Fபரிமாற்றம் - கவிரதஇலக்கியம்- அறிமுகம், விடுதரலக்குமன்Fம்பின்Fம் - நாைகம் - சிறுகதத).

Translation:Typesoftranslation-Importanceandneedoftranslation-Machinetranslation-Principles -Literarytranslation.

IntroductiontoLinguistics:LanguageandLinguistics-Linguistics–Characteristicsofappliedlanguage – Fields of Linguistics. Creation of creativity (Exchange of ideas - introduction to poetry literature, before and after liberation - drama - short story).

REFERENCES

மு.வரததரான்“ தமிழ்இலக்கியவரதலாறு” த ா ஹித்யஅகமைமிபப்ளிபகஷன்ஸ் , 2012 மதபான்மிதமாறன் “அபதைான்தமிழ்இலக்கெம்“அபதைான்பப்ளிஷிங்குரூப், வஞ்சியூர், திருவனந்தபுரம், 2007. http:/www.tamilvu.org/libirary/libindex.htm. http:/www.gunathamizh.com/2013/07/blog0post_24.html தநா.தவானதமாமரல, “தமிழர்தநாைடுப்தபாைல்கள்” நியூமஞ்சுரிபுத்தகமவளியீைைகம் 1964,2006 தநா.தவானதமாமரல “பழங்கரதகளும், பழமதமாழிகளும் ”நியூமஞ்சுரிபுத்தகமவளியீைைகம், 1980,2008

24ENG110	AdditionalEnglish–II	2 002

Objectives:

- Toexposethe studentsto variousgenres ofEnglishLiterature.
- ToexposethestudentstoIndian EnglishWritingofdifferenttimelines.
- To develop sensibility to read and understand literature and thereby encourage them to be sensitive to the whole spectrum of human experience.

COs	Course Outcomes
CO 1	Todemonstrateanabilityto criticallyappreciateanyliterarytext
CO 2	Toexhibit an abilityto narrateand expresstheir thoughts and idea.
CO 3	Tobeable to evaluateand relateto common human experiences

Unit-I

Introduction:

Drama: Tragedy&Comedy,Characters,Setting

Prose:FictionandNon-Fiction

LifeWriting.: Biography,Autobiography,Memoirs

Unit-II

Essays:

*ShashiTharoor-**AChild'sReadinginIndia***

*SarvepalliRadhakrishnan-**Gandhian Outlook***

Unit-III

Play:*Silence!TheCourtisinSession'*byVijayTendulkar

Unit-IV

Non-Detailreading:

Karma–Khushwant Singh

KailashSatyarthi'sNobelLectureon10December2014atOsloCityHall,Norway

OfMothers,amongotherthings.ByA.K.Ramanujan

Unit-V

CriticalAppreciationandCreativeWriting:ClassActivity

Core Reading

- Habib,M.A.R,***LiteraryStudies,ANortonGuide***,Norton&Co, 2020
- Naik,M.K.,***AHistoryofIndianEnglishLiterature,***SahityaAcademy

References:

- Tendulkar,Vijay,***Silence!TheCourtisinSession,***OxfordUniversityPress,1982
- *Tharoor,Shashi,**AChild'sReadinginIndia,***WashingtonPost,Dec1991
- *GandhiOutlookandTechniques*-MinistryofEducation,January1,1953
- Singh,Khushwant,***CollectedShortStories***,RaviDayalPublishers,1989
- **NobelLecture–Audio**[https://www.youtube.com/watch?v=UNZNbcf5Hd8]

AssessmentComponent	Weightage
Continuous Evaluation (ClassTests,CriticalAppreciation,Creative Writing)	20
MidTermExamination	30
EndSemesterExamination	50
Total	**100**

22ADM111	GLIMPSESOFGLORIOUSINDIA	L-T-P-C:2-0-1-2

CourseObjective(s)

To introduce students to the depths and richness of the Indian culture and knowledge traditions, and toenablethemtoobtainasynopticviewofthegrandioseachievementsofIndiaindiversefields.To equip students witha knowledge of their country and its eternal values.

CourseOutcomes

COs	Description
CO1	ThispartdealswithtwotopicsTheNeedtoBecomeFearlessinLifeandtheRoleorStatusofWomenin India.
CO2	ThispartdealswiththreetopicsTeachingsandPrinciplesofChanakya,Differencebetweentheterms GodandIswaraandContributionofBhagavadGita
CO3	ThisareahandlestwoimportantconceptsIndianSoftpowersandAportrayalofhownaturewaspre-servedthroughthemediumofFaith.Innerpowerisaboutnevergivinguponyourdreams. Tomanifest more of what you desire in life, you must be prepared to embrace your innerpower.Youmustbepersistentifyouwanttosucceed.Maintainyourmodestyandneverstoplearn- ing. Inner strength is an attitude to life. Faiths shape and direct how we think, act, and live our lives. However,faith'spowerisnotsolelyspiritual.Topreservenature,ourforefathersestablishedsystemsand traditions based on faith. Our culture and faith are intricately bound to nature.
CO4	TwoimportanttopicsarediscussedhereABriefhistoryofAncientIndianCulturesandaDiscussionon Practical Vedanta. Indianculture is the legacyofthe ethno-linguisticallydiverse country's social norms, moralprinciples,traditionalpractices,beliefsystems,politicalsystems,artefacts,and technologies.Fol-lowing every invasion or change of political control, new kingdomscarriedtheirrespectivecultureswiththem,addingtotheIndianculture.Vedantaisthephiloso-phyoftheUpanishads.Everysoulpossessesthepotentialto bedivine.Theobjectiveistomanipulatethis inner divinity by invoking both internal and external natural forces.
CO5	Fromthispart,astudentgetsaninsightintothecontributionthatIndiahasmadetotheworld.Moreover, foreignpowershavebeentryingtohumiliateanddegradeIndiainfrontoftheworldforsolong. How-ever,itshouldberecognizedthatmanyinventionsthatareconsideredbeneficialtothe worldtodayhave been contributed by the great men of India.

CO-POMapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	3	2	2	-	-	-	3	-	-	3	-	-	-
CO2	-	-	2	-	-	-	-	2	2	-	-	2	-	-	-
CO3	-	-	3	-	2	-	3	2	2	-	-	3	-	-	-
CO4	-	-	1	-	-	-	1	1	-	-	1	-	-	-	-
CO5	2	-	-	1	1	-	2	-	-	-	3	3	-	-	-

Syllabus

1. Chapter1-FacetheBrutes
2. Chapter2-RoleofWomeninIndia
3. Chapter3-AcharyaChanakya
4. Chapter4-Godand Iswara
5. Chapter5-BhagavadGita:FromSoldiertoSamsarintoSadhaka

6. Chapter6-LessonsofYogafromBhagavadGita
7. Chapter7-IndianSoftPowers:ASolutionForManyGlobalChallenges
8. Chapter8-NaturePreservationthroughfaith
9. Chapter9-AncientCultureswhathappenedtothem.
10. Chapter10-PracticalVedanta
11. Chapter11-TotheWorldfromIndia
12. Chapter12-IndianApproachtoScience

Textbooks/References

1. GlimpsesOfGloriousIndia

Evaluation Pattern

Assessment	Weightage(%)
Midterm	30
ContinuousAssessment	20
EndSemesterExam	50
TotalMarks	100

SEMESTER III

NUTRITIONALBIOCHEMISTRY

SemesterIII	**HoursofInstruction/week–4**
CourseCode:25FSN201	**No.of Credits–4**
L-T-P – 3-1-0-4	**Total60 hrs.**

Pre-requisite: Schoollevelchemistryofbiomolecules

CourseObjective: Toimpartknowledgeonthebiochemistryandmetabolismofmacronutrientsand micronutrients.

CourseOutcomes: Attheendofthecourse,thestudentswillbeableto

CO1: Understandthefundamentalconceptsofnutritionandfunctionsofenzymesandhormones.
CO2: Gainknowledgeonthechemical/biochemicalpropertiesandmetabolicpathwaysofcarbohydrates, proteins, lipids and nucleotides.
CO3: Acquireaclearunderstandingonthesignificanceofnucleicacidsinproteinsynthesis.

Skills:Toprovidewideknowledge inconnectiontonutritionandbiochemistryinvolved inthefood components.

CO-POMappings

	PO1	PO2	PO3	PO4	PO7	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	2	3	-	-	3	3	2	-	-
CO2	0	-	3	3	-	-	-	3	2	-	-
CO3	0	-	3	3	-	-	-	3	2	-	-

Syllabus:

UNITI-Biomolecules **12 hrs**

Anoverviewofbio-macromolecules:carbohydrates,lipids,aminoacids,proteinsandnucleicacids

UnitII-ChemistryofEnzymesandHormones **12 hrs**

Enzymes - Classification, nomenclature and general properties -Mechanisms of enzyme action, regulation of enzyme activity-Roleofcoenzymesandcofactorsinenzymeactivity -Factorsaffectingenzymeactivity-Enzymeinhibition- iso-enzymes and immobilized enzymes - Clinical significance of enzyme assays.

Hormones-Classification,secondmessengers,andmechanismofaction-Neuro-endocrinecontrolof metabolism - Hormonal disorders - Counter regulatory hormones.

UnitIII-ChemistryofCarbohydratesandProteinsandtheirMetabolism12hrs Carbohydrates, Aerobic and anaerobic degradation - Glycogenesis,Glycogenolysis,Gluconeogenesis-HMPshuntpathway-Alcoholicfermentation–Hormonalregulations of blood glucose. Proteins and amino acids – Classification, structure and physico-chemical properties - Protein degradation and metabolism - Urea cycle - Glutamine and alanine cycle – Protein biosynthesis.

Unit IV - Chemistry of Lipids and Nucleotides and their Metabolism 12 hrs
Lipids,Metabolicpathwaysoftriaclyglycerol,fattyacids,cholesterolandlipoproteins-Biosynthesisoffattyacidsand ketone bodies. Nucleic acids: Classification - metabolism of nucleic acid components - Biosynthesis of nucleotides.

UnitV-NucleicAcids12hrs

Chemistry and metabolism of nucleic acids: definition, components, nucleosides, nucleotides, structure of DNA and RNA, types of RNA, replication, transcription, role of DNA and RNA in protein synthesis. Basics of molecular biology and genetics, molecular basis of mutation, restriction enzymes, recombinant DNA technology, cloning of genes.

Textbooks:

1. AdvancedNutritionandHumanMetabolism,GropperSS,Smith,JL,andGroffJL,7thEdition,2018.
2. Wardlaw's Perspectives in Nutrition, Carol Byrd-Bredbenner, et al., 9th Edition, 2013.
3. Harper's Illustrated Biochemistry by Murray, Bender, Botham, Kennelly, Rodwell, and Well (McGraw Hill Publishers), 29th Edition.

Referencebooks:

1. HandbookofFoodandNutrition,Dr.M.S.Swaminathan,TheBangloreprintingandpublishingCo.Ltd. (Bangalore press), 2004.
2. Lehninger,PrinciplesofBiochemistry,WHFreeman&Co,2021.
3. LubertStryer,JeremyM.Berg,Biochemistry,WHFreeman,2019.
4. ColorAtlasofBiochemistrybyKoolmanandRoehm.Thieme,2ndedition,2005.
5. Introduction to Nutrition and Metabolism, David A. Bender, 4thedition, CRC Press, 2008.

EvaluationPattern

Assessment	Internal	External
P1+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar.

CLINICALNUTRITIONANDDIETETICS–I

SemesterIII	**HoursofInstruction/week–4**
CourseCode:25FSN202	**No.ofCredits–4**
L-T-P – 2-2-0-4	**Total60 hrs.**

Pre-requisite: Dietarymanagement&RoleofDieticians

CourseObjective:

1. Extensivestudyofdietarymanagementincommondiseases.
2. Dealswithroleofdieticianinhospitalandcommunitysettingsinnutritioncare,casebasedstudyof patient's condition followed by dietary principles and management.

CourseOutcomes:

CO1:UnderstandthebasicconceptsofDietarymanagement.
CO2:Acquireknowledgeoftherolesandresponsibilities,skills,ethicsandopportunitiesof a dietician and nutritional assessment methods.
CO3:Applyprinciplesofdiettherapyininfectionandphysiologicalstress.
CO4:Comprehendthecauses,symptoms,anddietarymanagementinmalnutrition. CO5:
Gain knowledge on nutrition and diet therapy in adverse food reactions.

Skills:

- Enhanceknowledgeandskillsofnutritionandtodevelopcriticalevaluationskillsthroughan integration of nutrition, dietetics and research.
- Applyingtechnicalskills,knowledgeofhealthbehavior,clinicaljudgment,anddecision-makingskills when assessing and evaluating the nutritional status of individuals and communities.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	-	2	2	-	2	3	2	2	1
CO2	3	1	-	2	2	-	2	3	2	2	1
CO3	3	1	-	2	2	-	2	3	2	2	1
CO4	3	1	-	2	2	-	2	3	2	2	1
CO5	3	1	-	2	2	-	2	3	2	2	1

Syllabus:

UnitI:FundamentalstoClinicalNutritionandDietetics 9hrs.

Definition and history of dietetics- Concepts of a desirable diet for optimum health-Interrelationship between food, nutritionandhealth-Factorsaffectingfoodchoices,Physiologicfactorsregulatingfoodintake-roleofneurotransmitters andnutrientsinhungerandsatiety,FoodPyramid,Myplate,FoodGuidanceSystem, Adjuncttodiettherapy,Foodand Drug Interactions

UnitII:PrinciplesofMedicalNutritionCareandRoleofDietician 12hrs.

PrinciplesofMNT,ScreeningandNutritionalAssessmentonhospitalpatients(ABCD)-Anthropometry,Biochemical, Clinical, Dietary Assessment, dietary Planning, Monitoring& Evaluation, documentation. role and responsibilities of dietitian- Definition, Diet counselling and nutrition educator, National and International Licensing- Registered Dietician – registration and membership, (IDA, NSI, NETPROFAN, ADA, HCPC, CORU, Dietitians of Canada, Dietitians Australia, Singapore Nutrition and Dietetics Association, DHA).

UnitIII:DietaryManagementinInfectionandPhysiologicalStress 12hrs.

Infection and Fever- General dietary considerations, Defense mechanism, metabolic changes during infection, Classificationandetiologyoffever/infection,ViciousCycle ofMalnutritionandInfection, nutritional management in Fever- Typhoid, Dengue, Malaria, Chronic disease-Tuberculosisca, HIV & AIDS

Physiological Stress- Stress and Physiologic Effects, Nutrition in wound healing, Surgery: Pre and post-surgical dietary management, burns, trauma, sepsis.

UnitIV:DietaryManagementinMalnutrition 15hrs.

Regulation of food intake and pathogenesis of obesity and malnutrition and starvation, Weight Imbalance-PrevalenceandClassification,GuidelinesforCalculatingDesirablebodyweight,Controlofappetiteandfoodintake - Neural control, hormonal control, insulin, estrogen and other peptides and hormones, Obesity-Etiology, Energy balance,Theories,Physiologyoftheobesestate,Healthrisks,DietaryManagement,Dietandlifestylemodification, Evaluationofsomecommondiets-Atkins,SurgicalManagement Preventive aspects,Underweight –Etiology, Diet management, Nutrition management in eating disorders, Anorexia Nervosa, Bulimia.

UnitV:NutritionManagementinFoodAllergies 12hrs.

Definitions, types of reactions,symptoms, mechanism of food allergy, foods involved in sensitivity, diagnosis, treatment,foodintolerance,Pathogenesis,foodallergens,symptoms,testsfordiagnosis,foodallergies -pollenfood allergysyndrome,latex–fruitsyndrome,fooddependent,exercise-inducedanaphylaxis,foodinducedanaphylaxis, food – protein induced enterocolitis syndrome, cow's milk protein allergy (CMPA). Management - restricted diets, elimination diets and hypo- sensitization.

ReferenceTextbooks:

1. Srilakshmi.B.Dietetics,NewageInternationalPublishers,9th Edition,2023.
2. DavidsonS,PassmoreR,BreckJFT.HumanNutritionandDietetics,TheEnglishLanguageBook Society and Churchill Livingston, 1975.
3. KathleenMLandEscottS.Krause'sFood,NutritionandDietTherapy,11thedn,W.B.SaundersCompany Pennsylvania, 2017.
4. KrauseandMahan'sFoodandtheNutritionCare Process,16thEdition,JaniceLRaymond&KellyMorrow, 2023

SuggestedReadings:

1. Bemadette.M.MarriottandSydneJCarlson,Nutritionalneedsincoldandhighaltitudeenvironments
2. Cresci,P.D.(Ed.).(2015).Nutritionsupportforthecriticallyillpatient:Aguideto Practice. CRC Press.
3. Escott-Stump,S.(2008).Nutritionanddiagnosis-relatedcare.LippincottWilliams&Wilkins.
4. Gable,J.,&Herrmann,T.(2015).*CounsellingskillsforDietitians*.JohnWiley&Sons.
5. Nelms,M.,&Sucher,K.(2015).Nutritiontherapyandpathophysiology.Nelson Education

EvaluationPattern

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

NUTRITIONALBIOCHEMISTRYPRACTICAL

SemesterIII	**Hoursof Instruction/ week –3**
CourseCode:25FSN281	**No.of Credits–1**
L-T-P – 0-0-3-1	**Total45 hrs.**

Prerequisite: Basicsonhandlingglassware,chemicalsandreagents

CourseObjective: Toimpartknowledgequalitativeandquantitativeestimationofthegivensample.

CourseOutcomes: Attheendofthecourse,thestudentswillbeableto CO1:

Understand the fundamental concepts biomolecules.
CO2:Gainhandsonexperienceinquantitativeandqualitativeanalysisofdifferentsamples

CO-POMapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	-	-	2	2	1	-	1	3	-
CO2	3	2	-	-	2	2	1	-	1	3	-

Practical **45hrs.**

S.No.	ListofExperiments
1.	Reactionsofglucose,fructose,galactose,maltose,lactoseandsucrose
2.	DeterminationofAcidNumberofanoil
3.	DeterminationOfIodineNumberofAnOil
4.	DeterminationOfSaponificationNumberofAnOil
5.	ReactionsofTyrosine,TryptophanandArginine
6.	EstimationOfProtein(BiuretMethod)
7.	EstimationOfGlucose(FolinWuMethod)
8.	EstimationOfUrea(Dam–TSCMethod)
9.	EstimationOfUricAcid(CarawayMethod)

Textbooks:

1. Varley,H.,Gowenlak,A.H.andHill,M.PracticalClinicalBiochemistry,WilliamItinmaonMedical Books, London, 2010.
2. Oser,B.L.,Harke'sPhysiologicalChemistryXIVEditionTataMcGrawHillPublishingCompanyLtd., Bombay, 2011

ReferenceBooks:

1. Sadasivam,S.andManickam,A.BiochemicalMethod,SecondEdition,NewAgeInternationalP.Ltd., Publishers, New Delhi, 2013.
2. Raghuramulu,N.,Madhavannair,K.andKalyanaSundaram,NationalInstituteofNutrition,2013,A Manual of Laboratory Techniques, Hyderabad, 500007

EvaluationPattern:

Internal(CA)	External	Total
80	20	100

*CA–Regular Labworkassessment

CLINICALNUTRITIONANDDIETETICS–IPRACTICAL

SemesterIII	**Hoursof Instruction/ week –3**
CourseCode:25FSN282	**No.of Credits–1**
L-T-P – 0-0-3-1	**Total45 hrs.**

Pre-requisite:Dietmanagement&RoleofDieticians Course

Objective:

- Acquireproficiencyinthepreparationofvarioustherapeuticdietsessentialforclinicalnutrition,including specialized hospital diets
- Developtheabilitytoformulatecustomizeddailymenuscateringtospecifichealthandspecialconditions.
- Expandknowledgeandunderstandingoftherapeuticdietaryinterventionsduringacutediseaseconditions.

CourseOutcomes:

CO01: Understandthebasicdietaryprinciplesinvolvedinplanningdiets,differentmalnutritionandspecial conditions.
CO02: Planandpreparedietstomeetthequalityandquantityrequirementsforspecificacutedisease conditions.

Skills: Developskillstoplanandprepareashorttermacutetherapeutic diet

COPOMappings:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO01	1	3	-	1	-	2	1	1	3	-	1
CO02	1	3	-	1	-	2	1	2	3	-	1

Practical **45hrs.**

S.No.	Titleofexperiments	Course Outcome
	DietduringMalnutrition&SpecialConditions	
1	Learntopreparehospitalspecialdiets-Clearliquid,Fluid,Soft,Bland,Enteral andParenteraldiet	CO01
2	Aday'smenuforaschoolgoingboywhoissufferingfromdiarrhoea	CO01
3	Aday'smenuforanoldwomansufferingfromconstipation	CO01
4	Aday'smenuforanunderweightadolescentgirloflowincome	CO01
5	Aday'smenuforanunderweightadolescentgirlofhighincome	CO01
6	Aday'salternatemenufora17yroldgirlsufferingwithirondeficiency anaemia	CO01
7	Aday'smenuforapregnantwomansufferingfromGestationalDiabetes	CO01
	DietDuringAcuteDiseaseCondition	
1	Aday'smenuforanadultwomansufferingfromHIV	CO02
2	Aday'smenuforanadultmansufferingfromAcuterenalfailure (AKI)	CO02
3	Aday'smenuforaschoolboysufferingfromTyphoid	CO02
4	Aday'smenuforanadolescentgirlsufferingfromjaundice	CO02
5	Aday'smenuforanadultmansufferingfromHepatitis	CO02
6	Aday'smenufora50yroldmansufferingfromCalciumstone	CO02
7	Aday'smenu fora7yroldboysufferingfromGlomerulonephritis	CO02

Textbooks&ReferenceBooks:

1. SrilakshmiV.DieteticsNewAgeInternationalP.Ltd.,9th edition,NewDelhi,2023.
2. NutritionandDieteticsbyB.Srilakshmi(Latestedition:2020)
3. TextbookofClinicalNutritionandDieteticsbyP.VasudevanandL.Sreedhar(Latestedition:2019)
4. ClinicalNutrition:EnteralandTubeFeedingbyJohnL.RombeauandRolandG.Phillips(Latestedition: 2018)
5. Krause'sFood&theNutritionCareProcess"byL.KathleenMahanandJaniceL.Raymond -Themostrecent edition is the 16th edition, published in 2023.
6. "NutritionTherapyandPathophysiology"byMarciaNelms,KathrynP.Sucher,andSaraLongRoth-The most recent edition is the 4th edition, published in 2019.
7. "Williams'Basic Nutrition&DietTherapy" byStaciNixMcIntoshandSaraLongRoth-15thedition, published in 2020.

EvaluationPattern:

Internal(CA)	External	Total
80	20	100

CA–RegularLabworkassessment

BASICSOFCOMPUTERAPPLICATIONS

SemesterIII	**Hoursof Instruction/week –2**
CourseCode:25FSN203	**No.ofCredits–2 Total**
L-T-P – 2 0 0 -2	**- 30 hrs.**

Prerequisite: Basicsofcomputerusage,Windows,Microsoftoffice

CourseObjectives:

1. Tolearnthecomputerperipheralsintheoperationofcomputers
2. Tounderstandthecomputernetworkinsharingofinformationthroughcomputers
3. Toacquiretheskillsintheapplicationsofwindowsindocumentation,dataanalysisandpresentation

CourseOutcomes:

CO1:UnderstandingthebasicComponentsofComputersandNetworkelements.
CO2:Developingprofessional-lookingnewsletters,pamphlets, charts,simplecalculationsetcusingtheauthorizing tools
CO3:Abletocreateandmanagedatabases&developapresentationskillsusingtheauthorizingtools CO4: Elicit multimedia presentation focusing on utilization of authorizing tools.
CO5:Abletoapplycomputerapplicationsinmealmanagementpracticesandexplorethenutritionalsoftware'sand ejournals in professional and academic endeavours.
Skills: Acquiretheskillsinexploringwindowsapplicationsindevelopmentofdocuments,dataanalysisinspreadsheet and power point presentation.

CO-POMapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	1	-	-	2	1	-	-	2	2
CO2	1	-	1	-	-	2	1	-	-	2	2
CO3	1	-	1	-	-	2	1	-	-	2	2
CO4	1	-	1	-	-	2	1	-	-	2	2
CO5	1	-	1	-	-	2	1	-	-	2	2

Syllabus:

UnitI-IntroductiontoComputers&Networks **6hrs.**

Introduction to Computers-OperatingSystem, CPU, Input and Output Devices,Mainand AuxiliaryStorage Devices, SoftwareandHardware,IntroductiontoComputerNetworks,BasicsofHTML,WWW,URL,Email,NetworkSecurit

UnitII–WordProcessingandSpreadsheets **6hrs.**

WordProcessing-Basicsofcreatingadocument,Formattingadocument,Printingadocument.Spreadsheet –Basicsof creating a worksheet, Creating tables, charts, pivot table & charts, Working with formulas

UnitIII–DatabaseManagementsystemandPresentation **6hrs.**

DatabaseManagementsystem–Creatingadatabasetable,queries,Developingformsandreports,Presentation-Creating a presentation using slide master and template, Formatting the slides, Animations, Transitions, Slide show

Unit IV-Multimedia **6hrs.**

Introductionofmultimedia,BasicElements,Hardware,ApplicationsofMultimedia,AuthorizingTools,Introduction to Video, and Audio editing software's.

UnitV-ApplicationofComputersinFoodScienceandNutrition **6hrs.**

Applications -NutritionEducationandCounselling,Nutrient andDietcalculations, Use of statistical software, AccessingDigitalLibrary,e-JournalsinFoodScienceandNutrition,RelevantNutritionsoftware's,Applicationsand Webpages.

Textbooks:

1. MicrosoftOffice2019Complete,BPBPublications

2. DineshMaidasani–LearningComputerFundementals,MSOfficeandInternetandWebTechnology, Laxmi Publications

ReferenceBooks:

1. BPB'sComputerCourseWindows10withMSOffice2016.

2. JohnWalkenbachHerbTysonMichaelR.GrohFaitheWempenLisaA.Bucki –MicrosoftOffice2010Bible, Wiley India.

3. AndrewS.Tanenbaum(2009)IVEdition,ComputerNetworks,PearsonEducationandDorlingKindersley Publishers, Delhi.

4. RalfSteinmetz and KlaraNahrstedt(2011)Multimedia- Computing,CommunicationsandApplications, Pearson Education and Dorling Kindersley Publishers, Delhi.

5. LearnMicrosoftOffice2019:AcomprehensiveguidetogettingstartedwithWord,PowerPoint,Excel, Access, and Outlook by Linda Foulkes

Evaluationpattern:

Assessment	Internal	External
Periodical1/Periodical2/Midterm	30	
*ContinuousAssessment(CA)	40	
EndSemester		30
Total	100	

*Labevaluation20marks,Project10marks,Assignment/seminar10marks.

23LSK201	LifeSkillsI	L-T-P-C:1-0-2-2

Pre-requisite: Anopenmindandtheurgeforself-development,basicEnglishlanguageskills, knowledge of high school level mathematics.

Course Objective: To assist students in inculcating soft skills, developing a strong personality, empoweringthemtofacelife'schallenges,improvingtheircommunicationskillsandproblem-solving skills.

Course Outcomes

CO1:SoftSkills-Todeveloptheself-confidenceandpositiveattitudetoface, analyze,andmanage emotions in real life situations, like placement process.

CO2:SoftSkills-Toempowerstudentstocreateabetterimpactonatarget audiencethroughcontent creation, effective delivery, appropriate bodylanguage and overcomingnervousness, in situations like presentations, Group Discussions and interviews.

CO3:Aptitude–Toanalyze,understand andsolvequestionsinarithmeticandalgebrabyemployingthe most suitable methods.

CO4: Aptitude - To investigate and apply suitable techniques to solve questions on logical reasoning.

CO5: Verbal – To infer the meaning of words & use them in the right context. To have a better understanding of the nuances of English grammar and become capable of applying them effectively.**CO6:Verbal-**

Toidentifytherelationshipbetweenwordsusingreasoningskills.Todevelopthecapacity to communicate ideas effectively.

Skills: Communication,self-confidence,emotionalintelligence,presentationskillsandproblem-solving Skills.

CO-POMapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1				2	2	2	2
CO2					2	2	2
CO3							3
CO4							3
CO5						3	3
CO6					3	3	3

Syllabus

SoftSkills

Soft Skills and its importance: Pleasure and pains of transition from an academic environment to work-environment. New-age challenges and distractions. Learning to benefit from constructive criticisms and feedback.Needforchangeinmindsetandup-skillingtokeeponeself competentintheprofessional world.

ManagingSelf: Knowingoneself,Self-perception,Importanceofpositiveattitude,Buildinganddisplaying confidence, Avoiding being overconfident, Managing emotions, stress, fear. Developing Resilience and handling failures. Self-motivation, Self-learning, and continuous knowledge up-gradation / Life-long learning. Personal productivity - Goal setting and its importance in career planning, Self-discipline, Importance of values, ethics and integrity, Universal Human Values.

Communication: Process, Language Fluency, Non-verbal, Active listening. Assertiveness vs. aggressiveness.Barriers in communication. Digital communication

Aptitude

Numbers: Types,PowerCycles,Divisibility,Prime,Factors&Multiples,HCF&LCM,Surds,Indices, Square roots, Cube Roots and Simplification.

Percentage: Basics,Profit,Loss&Discount,andSimple&CompoundInterest.

Ratio,Proportion&Variation: Basics,Alligations,Mixtures,andPartnership.

Averages: Basics, and Weighted Average.

Equations: Basics, Linear,Quadratic,Equations ofHigherDegreeandProblemsonages.

LogicalReasoningI: BloodRelations,DirectionTest,Syllogisms,Series,Oddmanout,Coding \& Decoding, Cryptarithmetic Problems and Input - Output Reasoning.

VerbalSkills

Vocabulary: Familiarize students with the etymology of words, help them realize the relevance of word analysis and enable them to answer synonym and antonym questions. Create an awareness about the frequently misused words, commonly confused words and wrong form of words in English.

Grammar (Basics): To learn the usage of grammar and facilitate students to identify errors and correct them.

Reasoning: Stress the importance of understanding the relationship between words through analogy questions.Emphasize the importance of avoiding the gap (assumption) in the argument/ statements/ communication.

Speaking Skills: Make students conscious of the relevance of effective communication in today's world through individual speaking activities.

WritingSkills:Introduceformalwrittencommunicationandkeepthestudentsinformedabouttheetiquette of email writing.

References:

1. Gulati.S.,(1006)"CorporateSoftSkills",NewDelhi, India:Rupa &Co.
2. Thehard truth aboutSoftSkills, byAmazonPublication.
3. VerbalSkillsActivityBook,CIR,AVVP
4. Nova'sGREPrepCourse,JeffKolby,ScottThornburg&KathleenPierce
5. TheBBCandBritishCouncilonlineresources
6. OwlPurdueUniversityonline teaching resources
7. www.thegrammarbook.comonlineteachingresources
8. www.englishpage.comonlineteachingresources andotherusefulwebsites
9. StudentWorkbook:QuantitativeAptitude&Reasoning,Corporate&IndustryRelations,Amrita Vishwa Vidyapeetham.
10. QuantitativeAptitudefor AllCompetitiveExaminations,AbhijitGuha.
11. Howto PrepareforQuantitativeAptitude fortheCAT,Arun Sharma.
12. HowtoPrepareforData Interpretationfor theCAT,Arun Sharma.
13. HowtoPrepareforLogicalReasoningfortheCAT,Arun Sharma.
14. QuantitativeAptitudeforCompetitiveExaminations,RSAggarwal.
15. AModernApproachtoLogicalReasoning,RSAggarwal.
16. AModernApproachtoVerbal &Non-VerbalReasoning,RSAggarwal.

EvaluationPattern

Assessment	Internal	External
Continuous Assessment (CA)*–Soft Skills	30	-
Continuous Assessment (CA)*–Aptitude	10	25
Continuous Assessment (CA)*–Verbal	10	25
Total	50	50

*CA-Canbe**presentations,speaking activitiesandtests.**

22AVP201Messagefrom Amma'sLifefortheModernWorld

Amma's messages can be put to action in our life through pragmatism and attuning of our thought process in a positive and creative manner. Every single word Amma speaks and the guidance received in on matters which we consider as trivial are rich in content and touches the very inner being of our personality. Life gets enriched by Amma'sguidanceandSheteachesustheartofexemplarylifeskillswherewebecomewitnesstoallthehappenings around us still keeping the balance of the mind.

22ADM211LeadershipfromtheRamayana

Introduction to Ramayana, the first Epic in the world – Influence of Ramayana on Indian values and culture – Storyline of Ramayana – Study of leading characters in Ramayana – Influence of Ramayana outside India – Relevance of Ramayana for modern times.

22ADM201StrategicLessonsfromtheMahabharata

Introduction toMahabharata, the largest Epicin the world – Influence ofMahabharata on Indian values and culture – Storyline of Mahabharata – Study of leading characters in Mahabharata – Kurukshetra War and its significance - Relevance of Mahabharata for modern times.

22AVP204LessonsfromtheUpanishads

Introduction to the Upanishads: Sruti versus Smrti - Overview of the fourVedas and the ten Principal Upanishads - ThecentralproblemsoftheUpanishads–TheUpanishadsandIndianCulture–RelevanceofUpanishadsformodern times – A few Upanishad Personalities: Nachiketas, SatyakamaJabala, Aruni, Shvetaketu.

22AVP205MessageoftheBhagavadGita

Introduction to Bhagavad Gita – Brief storyline of Mahabharata - Context of Kurukshetra War – The anguish of Arjuna–CounselbySri.Krishna–KeyteachingsoftheBhagavadGita–KarmaYoga,JnanaYogaandBhaktiYoga
- Theory of Karma and Reincarnation – Concept of Dharma – Concept of Avatar - Relevance of Mahabharata for modern times.

22AVP206LifeandMessageof SwamiVivekananda

Brief Sketch of Swami Vivekananda's Life – Meetingwith Guru – Disciplining of Narendra -Travel across India - InspiringLifeincidents –AddressattheParliament ofReligions –TravelinUnitedStatesandEurope –Returnand reception India – Message from Swamiji's life.

22AVP207LifeandTeachingsofSpiritualMastersIndia

Sri Rama, Sri Krishna, Sri Buddha, AdiShankaracharya, Sri Ramakrishna Paramahamsa, Swami Vivekananda, Sri RamanaMaharshi, Mata Amritanandamayi Devi.

22AVP208InsightsintoIndianArtsand Literature

Theaimof this course istopresentthe rich literature and culture of Ancient India and help students appreciate their deepinfluenceonIndianLife-Vedicculture,primarysourceofIndianCulture–Briefintroductionandappreciation of a few of the art forms of India - Arts, Music, Dance, Theatre.

22AVP209YogaandMeditation

The objective of the course is to provide practical training in YOGA ASANAS with a sound theoretical base and theoryclassesonselectedversesofPatanjali'sYogaSutraandAshtangaYoga.Thecoveragealsoincludestheeffect of yoga on integrated personality development.

22AVP210KeralaMuralArtandPainting

MuralpaintingisanoffshootofthedevotionaltraditionofKerala.Amuralisanypieceofartworkpaintedorapplied directly on a wall, ceiling or other large permanent surface. In the contemporary scenario Mural painting is not restricted to the permanent structures and are being done even on canvas. Kerala mural paintings are the frescos depictingmythologyand legends, whichare drawn onthe walls of temples and churchesin South India, principally in Kerala. Ancient temples, churches and places in Kerala, South India, display an abounding tradition of mural paintings mostly dating back between the 9th to 12th centuries when this form of art enjoyed Royal patronage. Learning Mural painting through the theory and practice workshop is the objective of this course.

22AVP213TraditionalFineArtsof India

Indiaishometooneofthemost diverseArtformsworldover.TheunderlyingphilosophyofIndianlifeis‘Únityin Diversity”andithasledtothemostdiverseexpressionsofcultureinIndia.MostartformsofIndiaareanexpression of devotion by the devotee towards the Lord and its influence in Indian life is very pervasive. This course will introduce students to the deeper philosophical basis of Indian Art forms and attempt to provide a practical demonstration of the continuing relevance of the Art.

22AVP214PrinciplesofWorshipinIndia

Indianmodeofworshipisuniqueamongtheworldcivilizations.Nowhereintheworldhasthephilosophicalideaof reverenceandworshipfulnessforeverythinginthisuniversefounduniversalacceptanceasitinIndia.Indianreligious life even today is a practical demonstration of the potential for realization of this profound truth. To see the all-pervadingconsciousnessineverything,includinganimateandinanimate,andconstitutingsocietytorealisethistruth can be seen as the epitome of civilizational excellence. This course will discuss the principles and rationale behind different modes of worship prevalent in India.

22AVP215TempleMural ArtsinKerala

ThetraditionalpercussionensemblesintheTemplesofKeralahaveenthralledmillionsovertheyears.Thesplendor of our temples makes art enthusiast spellbound, warmth and grandeur of color combination sumptuousness of the outline, crowding of space by divine or heroic figures often with in vigorous movement are the characteristics of murals.

The mural painting specially area visual counterpart of myth, legend, gods, dirties, and demons of the theatrical world, Identical myths are popular the birth of Rama, the story of Bhīma and Hanuman, Shiva, as Kirata, and the Jealousy of Uma and ganga the mural painting in Kerala appear to be closely related to, and influenced by this theatricalactivitythearthistoriansontempleplanes,woodcarvingandpaintingthearchitecturalplaneoftheKerala temples are built largely on the pan-Indians almost universal model of the Vasthupurusha.

22AVP218InsightsintoIndianClassical Music

Thecourseintroducesthestudentsinto the various terminologies usedin Indianmusicologyand their explanations, like Nadam, Sruti, Svaram – svara nomenclature, Stayi, Graha, Nyasa, Amsa, Thala,- Saptatalas and their angas, Shadangas,Vadi,Samavadi,Anuvadi.ThecoursetakesthestudentsthroughCarnaticaswellasHindustaniclassical styles.

22AVP219InsightsintoTraditionalIndianPainting

ThecourseintroducestraditionalIndianpaintingsinthelightofancientIndianwisdominthefieldsofaesthetics,the Shadanga (Sixs limbs of Indian paintings) and the contextual stories from ancient texts from where the paintings originated. The course introduces the painting styles such as Madhubani, Kerala Mural, Pahari, Cheriyal, Rajput, Tanjore etc.

22AVP220InsightsintoIndianClassicalDance

The course takes the students through the ancient Indian text on aesthetics the Natyasastra and its commentary the AbhinavaBharati. The course introduces various styles of Indian classical dance such as Bharatanatyan, Mohiniyatton,Kuchipudi,Odissy,Kataketc.Thecoursetakesthestudentsthroughbothcontextualtheoryaswellas practice time.

22AVP221IndianMartialArtsandSelf Defense

The course introduces the students to the ancient Indian system of self-defense and the combat through various martialartformsandfocusesmoreontraditionalKerala’straditionalKalariPayattu.Thecourseintroducesthevarious exercisetechniquetomakethebodysuppleandflexiblebeforegoingintothestepsandtechniquesofthemartialart. The advanced level of this course introduces the technique of weaponry.

SEMESTER IV

FOODMICROBIOLOGY

SemesterIV	**HoursofInstruction/week–3**
CourseCode:25FSN211	**No.ofCredits–3**
L-T-P – 3-0-0-3	**Total45 hrs.**

Pre-requisite: Basicknowledge-microorganisms,food-basedmicrobes.

CourseObjective:

1. Toobtainknowledgeonmorphologyofmicroorganismsandtypesofmicroscopy
2. Tounderstandthefactorsinfluencingthegrowthofmicroorganisms
3. Toapplythepreservationprinciplesandmethodstopreservethefoodsfrommicrobial contamination
4. Toexplorethebeneficialeffectsofmicroorganismsinthedevelopmentoffoodproducts.

CourseOutcomes:

CO1: Gainabetterunderstandingofmicroorganismsandmicroscope,itsvitalroleinthefieldof microbiology.
CO2: Abletounderstandthechancesofspoilageinplant-based foods.
CO3: Abletoevaluatemicrobialqualityoffoods
CO4: Explorethepivotalroleofmicroorganismsinfermentationtechnology.
CO5: Abletodifferentiatefoodinfectionandintoxication.

Skills:Developskillsinidentification,testingandcontrolofmicroorganismsinrelationtofoodsafety.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	1	-	1	-	2	-	-	2	-
CO2	3	1	1	-	1	-	2	-	-	2	-
CO3	3	1	1	-	1	-	2	-	-	2	-
CO4	3	1	1	-	1	-	2	-	-	2	-
CO5	3	1	1	-	1	-	2	-	-	2	-

Syllabus:

UnitI:IntroductiontoMicrobiology,MorphologyandGrowthfactorsofMicroorganisms 9hrs.

DefinitionandHistory,Microscopy,LightandelectronMicroscopy,GeneralMorphologyofMicroorganisms Bacteria, Fungi, Algae, Yeast and Virus-Bacteriophage , Microbial Biomass, Growth Curve, Definition of Batch and Continuous culture, Factors Affecting Growth - Intrinsic Factors, Nutrient Content, pH, Redox Potential, Antimicrobial, Barrier and Water Activity. Extrinsic Factors: Relative Humidity, Temperature and Gaseous Atmosphere, Enumeration strategy of microorganisms, Simple microbial test- sampling, counting

UnitII:MicrobiologyofPlantbasedFoods 9hrs.

OutlineofContamination,SpoilageandPreservationofVegetablesandFruits,CerealsandCerealProducts, Pulses, Nuts and oilseeds, Sugar and Sugar Products

UnitIIIEvaluationofMicrobialQualityofFoods 9hrs.

Methods,AssaysusedtoassesstheMicrobialLoadsofdifferentfoods,PermittedlevelsofMicrobialLoad in different foods, Microbes responsible for Food Quality, Microbiological evaluation standards.

UnitIV:BeneficialEffectsofMicroorganisms 9hrs.

FermentedFoods–Curd,Cheese,Sauerkraut,Meat,SoyBasedFoods,AlcoholicBeveragesandVinegar

UnitV:FoodIntoxicationandFoodInfection 9hrs.

Food Borne Diseases – Classification- Intoxication – Botulism and Staphylococcal intoxication- Infection – Salmonellosis, Clostridium Perfringens illness, Bacillus cereus, Ecoli, Shigellosis, Yearsinia and Streptococcus faecalis – Foods involved, Disease's outbreak, Preventive and control measures.

ReferenceTextbooks:

1. JayM.J (2015)ModernFoodMicrobiology,FourthEdition,CBSPublishersandDistributors,New Delhi
2. Ramesh,K.V(2012)FoodMicrobiology,MJPPublishers,Chennai.
3. Tamine,A(2015)ProbioticDairyProducts,BlackwellPublishing,USA.
4. WilliamC.Frazier(2014)FoodMicrobiology,TataMcGrawHillsPublishingCompanyLimited, Chennai.

SuggestedReadings:

1. Adams,MRandMoss,MO(2015)FoodMicrobiology,NewAgeInternational(P)Ltd.,NewDelhi.

2. CappuccinoG.JandSherman,N(2008)Microbiology–ALaboratoryManual,PearsonEducation Publishers, USA,.

3. JayM.J(2015)ModernFoodMicrobiology,FourthEdition,CBSPublishersandDistributors,NewDelhi.

EvaluationPattern

Assessment	Internal	External
Periodical1/Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50
Total	100	

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

CLINICALNUTRITIONANDDIETETICS–II

SemesterIV **CourseCode:25FSN212** **L-T-P – 2-2-0-4**	**HoursofInstruction/week–4 No. of Credits – 4** **Total60 hrs.**

Pre-requisite: MedicalNutritionTherapy&Diseases

CourseObjective:

1. Togivebetterunderstandingontheroleofnutritionformanagingdiseasecondition.
2. Tocreatebetterknowledgeondifferenttherapeuticdietsandtheirapplications.
3. Toacquirerelevantskillstodevelopasa dietitian.

CourseOutcomes:

CO1:Understandthetypesoftherapeuticandrequirementsofspecialdiets.
CO2:Gaincoreknowledgeonthedietarymanagement ofmetabolicsyndromeandassociateddisorders CO3: Gain experience on the dietary management of gastrointestinal tract disorders
CO4:Gainknowledgeonthedietaryplanningforliverandkidneydiseases
CO5:Understandthedietarymanagementinvolvedinneoplasticandspecificdiseases

Skills:

- Developskillsandtechniquesintheplanningandpreparationofdietsforvariousdiseaseconditions
- Applyingprinciplesofdiettherapyinplanning,preparationandnutrientcalculationofhospitaldiets, therapeutic diets for various diseases

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	-	2	2	-	2	3	2	2	1
CO2	3	1	-	2	2	-	2	3	2	2	1
CO3	3	1	-	2	2	-	2	3	2	2	1
CO4	3	1	-	2	2	-	2	3	2	2	1
CO5	3	1	-	2	2	-	2	3	2	2	1

Syllabus:

UnitI:IntroductiontoTherapeuticandSpecial Diets 9hrs.

Types oftherapeuticdiets,routine hospital diet-customized diet plan-Regular Diets,MechanicallyAlteredor Fiber-Restricted Diets, Liquid Diets, Diet for Dysphagia, Diet Modifications for Therapeutic Care - Modifying Basic Nutrients, Modifying Energy Value, Modifying Texture or Consistency, Modifying Seasonings, Special feeding methods-enteral nutrition, parenteral nutrition, tube feeding, malnutrition in hospitalized patients-the cycle of malnutrition and infection

Typesofspecialdiet-vegandiet,gluten-freediet,Ketogenicdiet,Atkinsdiet,Mediterraneandiet,Diabeticdiet,Renal diet, DASH diet, low fat diet, Paleolithic diet, FAD diet, current trends in personalized nutrition.

UnitII-DietaryManagementofMetabolicSyndromeDisorders 15hrs.

Diabetesmellitus–types,etiology,symptomsanddiagnosis,aimsofdietarytreatments,specialdietaryconsideration for type I and II diabetics, complications of diabetes, Food exchange list, Glycemic Index, glycemic load, CHO counting, Sweeteners and Sugar Substitutes, significance of physical activity

Diseases of the heart and blood vessels- etiology, symptoms and diagnosis; atherosclerosis, lipids and other dietary factorsandcoronaryheartdiseases(CHD).DietinCHD,hypertension,congestiveheartfailureandhyperlipidemia. **Unit III: Dietary Management of Gastrointestinal Disease 12hrs.**

PathophysiologyofGITractDiseases-Anatomic,PhysiologicandFunctionalChanges,ImpactonNutritionalStatus,

Diseases of Esophagus and Stomach-Nutritional requirement and dietary modification in Esophagitis, Dyspepsia, GERD, Peptic Ulcer, Gastritis, Gastrectomy -Dumping Syndrome, Intestinal Diseases, Flatulence, Diarrhoea, Constipation, Hemorrhoids, Diverticular disease, Inflammatory Bowel Disease- Crohn's disease Ulcerative Colitis, Irritable bowel syndrome, Malabsorption Syndrome.

UnitIV-DietaryManagementinLiverandKidneyDiseases 12 hrs.

Diseases of the liver - functions of liver, clinical assessment of liver function. Pathogenesis, signs and symptoms of hepatitis, acute liver failure, cirrhosis and encephalopathy. Nutritional management in liver diseases.

Dietarymanagementingallbladderdiseases.

Diseasesofthekidney-functionsofkidney,clinicalassessmentofkidneyfunction.Pathogenesis,signsandsymptoms of acute and chronic renal failure, nephrotic syndrome and renal calculi. Nutritional management in kidney diseases and during renal replacement therapy

UnitV-DietaryManagementinNeoplasticandSpecificDiseases 12hrs.

Cancer- Types, stages and markers, Nutrition in the etiology of cancer, Nutritional effects of cancer and cancer therapy, nutritional care of cancer patient, Guidelines on Quality of Life improvement, food supplementary.

Gout- Role of protein & purine, Etiology, Symptoms & complication, dietary Management. Inborn Errors of Metabolism- PKU, MSUD, Tyrosinemia, Homocystinuria, Glycogen storage Disorder, Galactosemia, Glutaricaciduria, Other Types.

ReferenceTextbooks:

1. Srilakshmi.B.Dietetics,NewageInternationalPublishers,9th Edition,2023.
2. DavidsonS,PassmoreR,BreckJFT.HumanNutritionandDietetics,TheEnglishLanguageBook Society and Churchill Livingston, 1975.
3. KathleenMLandEscott S.Krause'sFood,NutritionandDietTherapy,11thedn,W.B.SaundersCompany Pennsylvania, 2017.
4. KrauseandMahan'sFoodandtheNutrition CareProcess,16thEdition,JaniceLRaymond&KellyMorrow, 2023
5. RobinsonCH.NormalandTherapeuticNutrition.OxfordPublishingCo,Bombay,1972.

SuggestedReadings:

1. ErdmanJW,MacdonaldIAandZeiselSH.PresentKnowledgeinNutrition,10thedn,
International Life Sciences Institute Press, Washington DC, 2012.
2. ShillsME,OlsonJA,MosheSandRossCA.ModernNutritioninHealthandDisease,9thedn,Lippincott
Williams and Wilkins, 2006.
3. GibneyMJ,MacdonaldIAandRocheHM.NutritionandMetabolism,BlackwellPublishing,UK,2003.
4. GibneyMJ,EliaM,LjungqvistOandDowsettJ.ClinicalNutrition,BlackwellPublishing,UK,2005.
5. ParkK.TextBookofPreventiveandSocialMedicine.21stedn,BanarsidasBhanotPublishers,Jabalpur, India,
2011.

EvaluationPattern:

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODMICROBIOLOGYPRACTICAL

SemesterIV	**Hoursof Instruction/week–3**
CourseCode:25FSN283	**No.of Credits–1**
L-T-P – 0-0-3-1	**Total45 hrs.**

CourseObjectives:

1. Understandthedifferentmethodsofsterilizationanddisinfection
2. Impartknowledgeondifferentasepticandpureculturetechniquesforenumerationofmicrobes

CourseOutcomes:

CO1: Acquire knowledge on different microbial techniques associated with food samples.

CO2:Gainpracticalexperienceonenumerationofbacteria,yeastandmoldsinfoodssamples **CO-PO Mappings**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	-	-	2	2	3	-	1	3	-
CO2	3	1	-	-	2	2	3	-	1	3	-

Practicals:

S.No.	ListofExperiments
1.	Instrumentsusedinmicrobiologicallaboratory,theirprinciplesandworking
2.	Methodsofsterilizationanddisinfection
3.	Mediapreparation
4.	Preparationofsamplesformicrobialanalysisusingdifferentdiluents
5.	AsepticCultureTechniques
6.	Isolatingbacteria:Pureculturetechniques
7.	Enumerationofbacteriafromdifferentfoodsample
8.	Microbialstainingtechniques
9.	Microbialexaminationofprocessedfoods
10.	Biochemicaltestsforidentificationofbacteria.
11.	AssessmentofmicrobiologicalqualityofmilksampleusingMethyleneBlueDyeReductionTest

TextBooks:

1. SilvaN.D,TaniwakiM.H.,ValériaC.A.JunqueiraV.C.A,SilveiraN.,OkazakiM.M.,GomesR.A.R.(2018). Microbiological Examination Methods of Food and Water- A Laboratory Manual, 2nd Edition. CRC Press,USA.
2. Waite-CusicJ.G.,YousefA.E.andJenniferJ.PerryJ.J.(2022).Analytical FoodMicrobiology.ALaboratory Manual. Wiley Publishers, USA.

EvaluationPattern:

Internal(CA)	**External**	**Total**
80	20	100

*CA–RegularLabworkassessment

CLINICALNUTRITIONANDDIETETICS–IIPRACTICAL

SemesterIV	**Hoursof Instruction/week–3**
CourseCode:25FSN284	**No.of Credits–1**
L-T-P – 0-0-3-1	**Total45 hrs.**

Pre-requisite:Dietmanagement&RoleofDieticians Course

Objectives:

1. Todevelopcompetencyinformulatingspecializeddietaryplanstailoredtoindividual needsandconditions, focusing on chronic diseases.
2. Toacquireproficiencyindesigningtherapeuticdietaryinterventionstargetinglifestyle-relateddiseasesand non-communicable diseases.

CourseOutcomes:

CO01: Studentswillbeabletodemonstratetheabilitytoformulatepersonalizeddietaryplansforindividualsaffected by chronic diseases conditions.

CO02: Studentswilldevelopproficiencyinmenuplanninganddietaryprescription,forspecificnon-communicableor lifestyle diseases conditions.

Skills: DevelopskillstoplanandprepareaLongtermtherapeutic diet

COPOMappings:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO01	1	2	-	1	-	-	1	1	1	-	1
CO02	1	2	-	1	-	-	1	2	1	-	1

Practical **45hrs.**

	DietDuringChronicDiseaseCondition
1	Aday'smenuforanadultmanwhohaveundergonepepticulcersurgery.
2	Aday'smenuforanadultwomansufferingfrompeptic ulcer
3	Aday'smenuforanadultwomanwhohaveundergoneacolonoperation.
4	Aday'smenuforanadolescentgirlwhoisinpostoperativeconditions
5	Aday'smenuforanadultmansufferingfromChronicrenalfailure(CKD)
6	Aday'smenuforanadultmansufferingfromTuberculosis
7	Aday'smenuforanadultmansufferingfromCirrhosis
	DietForLifestyleDiseaseConditionorNon-CommunicableDiseases
1	Aday'smenuforoverweightadolescentboy
2	Aday'smenuforaschoolgoingobese girl
3	Aday'smenuforanadultmansufferingfromIDDM
4	Aday'smenuforanadultwomansufferingfromNIDDM
5	Aday'smenuforawoman(16-38yrs)sufferingfromBreast Cancer
6	Aday'smenufora50yroldmansufferingfromHypertension
7	Aday'smenufora50yroldmansufferingfromCVD

Textbooks&ReferenceBooks:

1. Srilakshmi,V.DieteticsNewAgeInternationalP.Ltd.,NewDelhi,2021.
2. NutritionandDieteticsbyB.Srilakshmi(Latestedition:2020)
3. TextbookofClinicalNutritionandDieteticsbyP.VasudevanandL.Sreedhar(Latestedition:2019)
4. ClinicalNutrition:EnteralandTubeFeedingbyJohnL.RombeauandRolandG.Phillips(Latestedition: 2018)
5. "Krause'sFood&theNutritionCareProcess"byL.KathleenMahanandJaniceL.Raymond -Themost recent edition is the 15th edition, published in 2018.
6. "NutritionTherapyandPathophysiology"byMarciaNelms,KathrynP.Sucher,andSaraLongRoth-The most recent edition is the 4th edition, published in 2019.
7. "Williams'Basic Nutrition&DietTherapy" byStaciNixMcIntoshandSaraLongRoth-The mostrecent edition is the 15th edition, published in 2020.

EvaluationPattern:

Internal(CA)	External	Total
80	20	100

CA–RegularLabWorkAssessment

24ENV200	ENVIRONMENTALSCIENCEANDSUSTAINABILITY	L-T-P-C:3-1-0-4

CourseObjective:

To provide a general understanding of our environment, problems during exploitation of natural resources, the importance of biodiversity and the need for its conservation, pollution and its impacts, and approaches for environment sustainability.

CourseOutcomes:

COs	Description
CO1	Understandtheover-exploitationofournaturalresourcesandtheneed for Sustainabledevelopment.
CO2	Understandtheconceptofecosystem,itsstructureandfunctionandthreatsto Ecosystems.
CO3	Understandtheconceptofbio-diversity,itsimportanceand conservation.
CO4	Classifypollutionanditsimpacts
CO5	Inferringdifferentapproachesforattainingenvironmentalsustainability.

CO-POMapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	0	0	0	1	1	1	0	1	1	1	1	1	1	0	0
CO2	1	1	0	1	1	1	1	1	2	1	1	1	1	1	1
CO3	1	1	0	1	1	1	1	1	2	1	1	1	1	1	1
CO4	2	2	0	1	1	1	1	1	2	1	1	1	1	1	1
CO5	2	2	1	2	2	2	1	2	2	1	1	1	1	2	2

Syllabus

Unit1

Multidisciplinary nature of environmental studies. Renewable and non-renewable Naturalresources. Overexploitation and conservation of the following natural resources -- forest,water,food,energy,mineral,andlandresources.Conceptofsustainability,sustainabledevelopment. ConceptofthreeR's(Reduce,Reuse,andRecycle).Conceptofzerowaste.Needforenvironmentaleducation.

Unit2

Conceptofecosystem.Components,structureandfunctionofanecosystem.Abriefdescriptionofforestecosystem and desert ecosystem. Food chain and food web, EcologicalPyramids.BiogeochemicalCycles(examples-Carbon,NitrogenandPhosphorous).EcosystemServices(exampleforest). Threatstoecosystems.Conservationofecosystems.

Unit3

ConceptofBiodiversity,hotspotsofbiodiversity,Indiaasamegadiversitynation,Threatstobiodiversity,

Value of biodiversity, Brief description of economic valuation of biodiversity,Red Data Base and Red data Book, International Union for Conservation of Nature **(IUCN)**Red ListofThreatened Species(Briefdescription),Conservationofbiodiversity.

Unit4

Pollution of air, acid rain, global warming and climate change, ozone layer depletion, Waterpollution, Soil pollution. Industrial and urban solid wastes, Hospital wastes, Hazardous waste,Collection, segregation of solid wastes, Different household disposal methods for degradablesolid wastes, Commercial water purification devices for households, Plastic pollution, microplasticsandits environmentalandhealtheffects.E-waste.

Unit5

Ecologicalfootprints-briefdescriptionofCarbonFootprintandWaterFootprint,LinearandCircular resource management, System thinking, Industrial ecosystems, Environmental Impact Assessment (EIA), EnvironmentManagementPlan(EMP),GreenTechnology,GreenBusiness,GreenAccounting,Green Buildings, Eco-Labeling, Sustainable (Green) Cities. Role of individuals in the up keeping of environment. **Text Books:**

1. PalanisamyP.N.,ManikandanP.,GeethaA.,ManjulaRan–EnvironmentalScience,Pearson Education.
2. HarikumarP.N.,SushaD. AndManojNarayananK. S.–Environmentmanagementandhuman rights. Himalaya Publishing House.
3. AsthanaD.KandMeeraAsthana–ATextbookofEnvironmentalStudies,S.Chand&CompanyPvt Ltd. Ran Nagar, New Delhi -110055.

References:

1. Bala Krishnamoorthy – Environmentalmanagement: Text and Cases.PHI LearningPrivate Limited.
2. JacobThomas–Environmentalmanagement:TextandCases.Pearson.
3. RajagopalnR.–EnvironmentalStudies:Fromcrisistocure.OxfordUniversityPress

EvaluationPattern

Assessment	Weightage(%)
Midterm	25
ContinuousAssessment	25
EndSemesterExam	50
TotalMarks	100

23LSK211	LifeSkills II	L-T-P-C:1-0-2-2

Pre-requisite: Willingnesstolearn,communicationskills,basicEnglishlanguageskills, knowledge of high school level mathematics.

CourseObjective: Tohelpstudentsunderstandthecorporatecultureandassisttheminimproving their group discussion skills, communication skills, listening skills and problem-solving skills.

Course Outcomes

CO1:SoftSkills-Toimproveinter-personalskills,professionaletiquetteandleadershipskills, vital for arriving at win-win situations in Group Discussions and other team activities.
CO2: Soft Skills - To develop the abilityto create better impact in a Group Discussions through examination,participation,perspective-sharing,ideation,listening,brainstormingandconsensus.
CO3:Aptitude-Tointerpret,criticallyanalyzeandsolvequestionsinarithmeticandalgebraby employing the most suitable methods.
CO4:Aptitude-Toanalyze,understandandapplysuitablemethodstosolvequestionsonlogicalreasoning. **CO5: Verbal -** To be able to use vocabulary in the right context and to be competent in spottinggrammatical errors and correcting them.
CO6:Verbal-Tobeabletologicallyconnectwords,phrases,sentences andthereby communicate their perspectives/ideas convincingly.
Skills: Communication,etiquetteandgrooming,inter-personalskills,listeningskills,convincingskills, problem-solving skill.

CO-POMapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1					2	2	2
CO2					2	2	2
CO3							3
CO4							3
CO5						3	3
CO6					3	3	3

Syllabus

SoftSkills

ProfessionalGrooming andPractices: Basicsofcorporateculture,keypillarsofbusiness etiquette – online and offline: socially acceptable ways of behavior, body language, personal hygiene, professional attire and cultural adaptability and managing diversity. Handling pressure, multi-tasking. Beingenterprising.Adaptingtocorporatelife:EmotionalManagement(EQ),AdversityManagement, Health consciousness. People skills, Critical Thinking and Problem solving.

GroupDiscussions: AdvantagesofgroupdiscussionsTypesofgroupdiscussionandRolesplayed in a group discussion. Personality traits evaluated in a group discussion. Initiation techniques and maintaining the flow of the discussion, how to perform well in a group discussion. Summarization/ conclusion.

ptitude

Logarithms,InequalitiesandModulus: Basics

SequenceandSeries: Basics,AP, GP,HP,andSpecial Series.

TimeandWork: Basics,Pipes &Cistern, andWork Equivalence.

Time,SpeedandDistance: Basics,AverageSpeed,RelativeSpeed,Boats&Streams,RacesandCircular tracks.

LogicalReasoningII: Arrangements,Sequencing,Scheduling,VennDiagram,NetworkDiagrams,Binary Logic, and Logical Connectives, Clocks, Calendars, Cubes, Non-Verbal reasoning and Symbolbased reasoning.

VerbalSkills

Vocabulary: Helpstudents understandtheusageofwordsindifferentcontexts.

Grammar(MediumLevel): TrainStudentstocomprehendthenuancesofGrammarandempower them to spot errors in sentences and correct them.

ReadingComprehension(Basics): Introducestudentstosmartreadingtechniquesandhelpthem understand different tones in comprehension passages.

Reasoning:Enablestudentstoconnectwords,phrasesandsentenceslogically.

OralCommunicationSkills:Aidstudentsinusingthegiftofthegabtointerpretimages,do avideo synthesis, try a song interpretation or elaborate on a literary quote.

References:

1. Adair.J.,(1.986),"EffectiveTeamBuilding:How tomakeawinningteam",London,U.K:PanBooks.
2. Gulati.S.,(2006)"CorporateSoftSkills",NewDelhi, India:Rupa &Co.
3. TheHard Truth about Soft Skills, byAmazonePublication.
4. VerbalSkillsActivityBook,CIR,AVVP
5. Nova'sGREPrepCourse,JeffKolby,ScottThornburg&KathleenPierce
6. TheBBCandBritishCouncilonlineresources
7. OwlPurdueUniversityonline teaching resources
8. www.thegrammarbook.comonlineteachingresources
9. www.englishpage.comonlineteachingresources andotherusefulwebsites
10. StudentWorkbook:QuantitativeAptitude&Reasoning,Corporate&IndustryRelations,Amrita Vishwa Vidyapeetham.
11. QuantitativeAptitudefor AllCompetitiveExaminations,AbhijitGuha.
12. Howto PrepareforQuantitativeAptitude fortheCAT,Arun Sharma.
13. HowtoPrepareforData Interpretationfor theCAT,Arun Sharma.
14. Howto Preparefor LogicalReasoningfortheCAT,Arun Sharma.
15. QuantitativeAptitudefor CompetitiveExaminations,RSAggarwal.
16. AModernApproachtoLogicalReasoning,RSAggarwal.
17. AModernApproachtoVerbal &Non-VerbalReasoning,RSAggarwal.

EvaluationPattern

Assessment	Internal	External
Continuous Assessment (CA)*–Soft Skills	30	-
Continuous Assessment (CA)*–Aptitude	10	25
Continuous Assessment (CA)*–Verbal	10	25
Total	50	50

*CA-Canbe**presentations,speaking activitiesandtests.**

LIVE-INLAB

SemesterIII	CourseCode:25FSN290	L-T-P–0-0-3-3

CourseObjectives

- Identifyandanalysethevariouschallengeindicatorspresentinthevillagebyapplyingconcepts of Human Centered Design and Participatory Rural Appraisal.
- UserNeedAssessmentthroughQuantitativeandQualitativeMeasurements
- DesigningasolutionbyintegratingHumanCenteredDesign concepts
- DevisingproposedinterventionstrategiesforSustainableSocialChangeManagement

CourseOutcome

CO1: Learnethnographicresearchandutilisethemethodologiestoenhanceparticipatory engagement.
CO2: PrioritizechallengesandderiveconstraintsusingParticipatoryRuralAppraisal.
CO3: Identifyandformulatetheresearchchallengesinruralcommunities.
CO4: Designsolutionsusinghumancenteredapproach.

CO-POMapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1		3	2	1	3	2	2
CO2		3	2	1	3	2	2
CO3		3	2	1	3	2	2
CO4		3		1	3	2	2

Syllabus

This initiative is to provide opportunities for students to get involved in coming up with technology solutionsforsocietalproblems.Thestudentsshallvisitvillagesorruralsitesduringthevacations(after 4th semester) and if they identify a worthwhile project, they shall register for a 3-credit Live-in-Lab project, in the fifth semester.

ThematicAreas

- Agriculture&RiskManagement
- Education&GenderEquality
- Energy&Environment
- Livelihood&SkillDevelopment
- Water&Sanitation
- Health&Hygiene
- WasteManagement&Infrastructure

The objectives and the projected outcome of the project will be reviewed and approved by the department chairperson and a faculty assigned as the project guide.

EvaluationPattern:

Assessment	**Marks**
Internal(ContinuousEvaluation)[75marks]	
Workshop(GroupParticipation)	15
VillageVisitAssignments&Reports	15
ProblemIdentificationandAssessment	15
Ideation:DefiningtheNeeds,ProposedDesigns&Review	20
PosterPresentation	10
External[25marks]	
ResearchPaperSubmission	25
Total	**100**
Attendance(Tobeaddedseparately)	5
GrandTotal	**105**

SEMESTERV

FOODPRODUCTDEVELOPMENTAND MARKETING

SemesterV	**HoursofInstruction/week–4**
CourseCode:25FSN301	**No.of Credits–4**
L-T-P – 3-1-0-4	**Total60hrs.**

Prerequisite: Productdevelopment,consumerviewonfoodproducts,producttesting,sensory evaluation

CourseObjectives:

1. Developnewfoodproductstosupportnutrienterprise.
2. Developentrepreneurshipskillsforsettingupsmallscalefoodindustries
3. Understandsustainablepackagingandlabellingfordifferentfoodproducts

CourseOutcomes:

CO1:Learnthetrendsanddimensionsinfoodconsumptionpattern
CO2:Understandandapplytheprinciplesinfoodproductdevelopmentanddesign. CO3:
Gain understanding in the development of convenience foods
CO4:Gainknowledgeondifferentstepsinvolvedinfoodtesting,evaluationandpackaging CO5:
Develop entrepreneurship skills and to plan financial and marketing strategies

Skills:

- Developskillsandprocessinnewfoodproductdevelopment.
- DevelopskillsinMarketingofFoodProducts.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	-	1	-	2	1	1	2	-
CO2	1	2	1	-	1	-	2	1	1	2	-
CO3	1	2	1	-	1	-	2	1	1	2	-
CO4	1	2	1	-	1	-	2	1	1	2	-
CO5	1	2	1	-	1	-	2	1	1	2	-

Syllabus:

UnitI-Foodconsumption pattern **10hrs.**

Definition, Elements. Food Insecurity, Factors contributing to Food insecurity, Trends in Food Consumption pattern, Factors affecting - Economical, Psychological and Sociological Dimensions of Food Consumption patterns.

UnitII-IntroductiontoFoodProduct Development **13hrs.**

PrinciplesandPurposeofNewProductDevelopment,StrategiesandTypesofproductdevelopment,Stagesof product development, Factors influencing, Recent trends and challenges, Design of experiments and Specifications.

Unit III –Development of Convenience Foods **13hrs.**

TraditionalFoods,Weaning Foods, ConvenienceFoods- RTE, RTS, Extrudedfoods,IMF Foods,Special Products,Healthfoods,NutritionalSupplements,FunctionalFoods,NutraceuticalsandDesignerFoods,Sports Foods, Foods for Defense Services, Space foods, flight foods.

Unit IV - Testing, Evaluation and Packaging of Products **12hrs.**

Standardization,Portionsize,PortionControl,QuantityCooking,ShelfLifeEvaluation-Sensoryand Microbial Testing of Processed Foods, Nutrient Analysis. Suitable Packaging Materials for Different Foods, SWOT Analysis, labelling information and designing, misbranded foods and loss.

Unit V Financial Management and Marketing of Food Products **12hrs.**

GovernmentandNongovernmentorganisations(TrainingandFinance)forEntrepreneurshipDevelopment. Financial Institutions (Central and State Government) banks/Funding
Agencies, Financial Accounting Procedures, Book keeping, Market Research, Marketing Strategies, digital marketing, Cost Calculation, Advertising Methods, Product sales, Product License, Legal specifications, Consumer Behavior and Food Acceptance, data sciences.

RelatedPracticalExperience

IndustrialVisit

TextBooks:

1. SudhirGupta(2017)HandbookofPackagingTechnology,EngineersIndiaResearchInstitute,NewDelhi
2. Khanaka,S.S.,EntrepreneurialDevelopment,S.ChandandCompanyLtd,NewDelhi,2016.

ReferenceBooks:

1. Suja,R.Nair(2014)ConsumerBehaviourandMarketingResearch,1st Edition,HimalayaPublishers.
2. Hmacfie,(2017)ConsumerledFoodProductDevelopment,WeedheadPublishingLtd.,UK
3. Fuller,Gordon,W(2015)NewFoodProductDevelopment,2nd Edition,CRCPress,BocaRaton,Florida,
4. Schaffner.D,J,Schroder,W.R.(2010)FoodMarketingandInternationalPerspectives,Web/McGrawHill Publication

EvaluationPattern

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODSERVICEMANAGEMENT

SemesterV	**HoursofInstruction/week–4**
CourseCode:25FSN302	**No.of Credits–4**
L-T-P – 3-1-0-4	**Total60 hrs.**

Prerequisite: Foodservicesystem,foodproduction,menuplanning,purchaseandstorage,institutional food service.

CourseObjectives:

1. Tocreateabetterunderstandingontheapproaches,tools,managementandresourcesofinstitutionalfood service.
2. Tomakebetterlearningonplanningandorganizingspace,personalandhygienemanagement.
3. Togiveknowledgeinsafetyandguidelinesinqualitycontrol.

CourseOutcome:

CO1:Gainexperienceinprinciplesandfunctioningoffoodservicesystem
CO2:Understandaboutfoodserviceflooringandlayoutsofequipmentarrangements. CO3:
Understand about institutional food and financial management.
CO4:Applyknowledgeonpersonnelmanagement,sanitationandhygieneinfoodserviceinstitutions. CO5:
Acquire technical skills on food safety and regulations acts followed in food service.

Skills: Developskillsinbulkfoodproductionandinstitutionalfoodservice.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	-	1	-	1	-	-	1	-
CO2	1	2	2	-	1	-	1	-	-	1	-
CO3	1	2	2	-	1	-	1	-	-	1	-
CO4	1	2	2	-	1	-	1	-	-	1	-
CO5	1	2	2	-	1	-	1	-	-	1	-

Syllabus:

UNITI-IntroductiontoFoodServiceSystem 12hrs.

Introduction, Types of food service establishment- commercial and non-commercial, Types of food service system- Conventional systems, Commissary system, ready prepared system and assembly service system, Methods of food delivery system. Need based specific units- Dietary, catering, institutional food service.

Menuplanning– Definition, types, Standardizationofrecipe,portion control,Styles offoodservice, current trendsin food service, management information system.

UNITII-InfrastructureandEquipmentinFoodService 12hrs.

PlanningandlayoutofFoodServiceunit -kitchenspace-sizeandtypes,worksimplification,designingkitchens,work centres in kitchen layout, storage and maintenance of kitchen, storage space-types and planning, service areas- design and planning.

Equipment - Classification, selection, design, installation, operation, purchase and maintenance, factors affecting selection of equipment, electrical and nonelectrical equipment for food storage.

UNITIII–InstitutionalFoodandFinancialManagement 12hrs.

Principles of management, Approaches to management, Functions of management, Tools of management, Management of resources.

Definition,applicationofmanagementAccountsofcateringoperators,Foodpurchasing-Differentpurchasing methods,Buying-QualitiesoffoodbuyerandReceivingmethods,costconcepts,bookkeepingandaccounting – systemsofbookkeeping,bookofaccountmaintenanceofaccountbooks,balancesheets,inventorbudgetary control, costing and budgeting, pricing, financial accounting and accounts information system.

UNITIV-PersonalManagementandHygiene 12hrs.

PersonnelManagement:concepts,staffemployment,employeebenefits,stafftraininganddevelopment,legal aspects of personal management.

Sanitation and safety- Hygiene, Sanitation and Safety in Food Service Institutions: Definition, importance, environmental hygiene and sanitation; hygiene in foodhandling; personnel hygiene of personnel; importance ofpestandrodentcontrolinfoodservices,Accidentsinfoodserviceestablishments,safetyprocedure,training, Educating, legal responsibilities of food service manager.

UNITV-FoodSafetyandStandardRegulations 12hrs.

FSSAI(Foodsafetystandardauthorityof India)–Introduction,actsandregulations-FSSAct2006,FSSRules 2011,FSSRegulations,Entrepreneurialshipincatering,FOSCOS-licensingandregistrationoffoodbusiness, FOSTAC, special responsibilitiesoffoodsafety, BIS, AGMARK, ISO, Hazard AnalysisandCritical Control Point System (HACCP)- Introduction, significance, principles and guidelines involved in HACCP System, education and training.

ReferenceBooks:

1. MohiniShetty,Institutionalfoodmanagement,NewageInternationalPublishers,2016.
2. MohiniSethiandSurjetMalhan.(2022).CateringManagement,"AnIntegratedApproach.(4thed.,). Bangalore : New Age International Pvt Ltd.
3. Suganthi,VandPremakumari,C.(2017).FoodServiceManagement.Chennai:DiptiPress(OPC) Pvt.LTD.
4. West,BB,Wood"FoodserviceinInstitutions",Johnwiley&Sons,NewYork
5. KhanMA"Foodserviceoperations",AVIpublishingCompanyInc.1987.
6. SethiandMahanS.-CateringManagementandintegratedapproach,Johnwiley&Sons,NewYork.
7. KotasRandDavisB"foodcostcontrol"Billing&SonsLtd,GreatBritian,1976
8. J.M.Diwan(1997)CateringandfoodserviceManagement,CommonWealthpublishers.
9. TerselMCandHarger–Professionfoodpreparation,Johnwiley&Sons,NewYork

EvaluationPattern

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

PACKAGINGANDLABELLINGOFFOODPRODUCTS

SemesterV	**HoursofInstruction/week–3**
CourseCode:25FSN303	**No.of Credits–3**
L-T-P – 2-1-0-3	**Total45 hrs.**

Prerequisite: Packagingmethods,packagingmaterials,Foodproductlabelling

CourseObjectives:

1. Torelatebetweenpackagingdesignandthechemistryofthefoodpackaged.
2. Togiveabetterunderstandingontheinfluenceofoxygeninstoragematerials.
3. Tocreateknowledgeonthedifferenttypesofmaterialsusedinfoodpackaging.
4. Togiveanunderstandingontheprinciplesoflabeling

CourseOutcomes:

CO1:Demonstrateknowledgeofthematerialinvolvedinpackagingwiththechemistryofthefoodpackaged. CO2: Describe the influence of oxygen in different types of packaging materials.
CO3: Demonstrate the advantages and disadvantages involved with different packaging material.
CO4:Acquireknowledgeonthefactorsandregulationsconsideredwhilepackagingandlabelling. CO5: Gain on basic fundaments of food regulatory laws used in packaging.

Skills: Developskillsinfood packagingbasedonthechemistryoffoodandpackagingmaterialsused**. CO PO**

Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	2	1	-	-	-	1	-	-	2	-
CO2	-	1	1	-	-	-	1	-	-	2	-
CO3	-	1	2	-	-	-	-	-	-	2	-
CO4	-	1	2	-	-	-	-	-	-	2	-
CO5	-	1	2	-	-	-	-	-	-	2	-

Syllabus:

Unit I - Packaging design and chemistry of food products **9 Hrs**

Food Packaging-Definition, Principles of packaging, Importance, relationship between Packaging and food, functional requirements for food packaging- preservation and protection, transport and storage, operational, communication,appellativefunction,persuasivefunction,informativefunction,environmentalrequirements. Integrated food packaging systems- Types, Food packaging and environmental ethics, sustainability in food packaging, packaging design.

UnitII-OxygenscavengingPackaging **9 Hrs**

ActivePackaging,oxygenscavengers,moisturecontrol,gaspermeabilitycontrol,ethylenescavengers,odour removers, antimicrobial packaging, carbon dioxide absorbers.

UnitIII-FoodpackagingMaterials **9 Hrs**

Chemicalfeaturesoffoodpackagingmaterials,characteristics,Ceramicpackagingmaterials,metalpackaging materials, cellulosic packaging materials, plastic packaging materials, multilayer packaging, testing and analysis.

UnitIVLabelingofFoodProducts **9 Hrs**

Components-Nutritionalinformation,factorstobeconsidered,designandgraphics,nutritionfacts
Labelling- Purpose, type, regulations, market survey on food labelling

UnitVRegulations **9 Hrs**

LawsandregulatorycompliancesUnderstandingBarcodes- WheretoGetBarcodes,Creatingyourown Barcodes, Incorporating Barcodes.

References:

1. Giovannibrunazzi,SalvatoreParisiandAminaPereno,Theimportanceofpackagingdesignforthe chemistry of food products, Springer, 2014.
2. AaronL.brody,EugeneR.StrupinskyandLauriR.Kline,Activepackagingforfoodapplications,CRC Press LLC, 2001.
3. LucianopiergiovanniandSaralimbo,foodpackagingmaterials,springerbriefsinmolecularscience- chemistry of foods, Springer 2016.

EvaluationPattern

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODPRODUCTDEVELOPMENT PRACTICAL

SemesterV	**HoursofInstruction/week –3**
CourseCode:25FSN381	**No.of Credits–1**
L-T-P – 0-0-3-1	**Total 45hrs**

Prerequisite: ProductDevelopmentStandardization,OrganolepticEvaluation.

CourseObjectives

1. Todevelopskillsinproduct development
2. Tocreateawarenessonthestepsinvolvedincostingandsalestechniques

CourseOutcomes:

CO1:Identifyandcategorizesuitablefoodsfordevelopingproducts,preparationofa new food product and Standardization of food products for large scale cooking
CO2:Gainknowledgeonmarketingtechniquesandlaunchingthedevelopedproducts

Skills: DevelopSkillsfornewfoodproductdevelopmentandstandardization

CO-POMapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	3	1	1	3	-	2	2	2	2	2
CO2	3	3	-	-	3	-	2	1	2	2	2

Practical's

45hrs

1.Recognitiontestforbasictastes
2.Typesofsensoryevaluation,
3.Exploringnovelfoodprocessingtechnologies
4.Cerealandpulsebasedproduct development
5.Novel foodsproductdevelopment-jams,squashorsyrups
6.Novelfoodsproductdevelopment-preserves,candies&toffees
7.Novelfoodsproductdevelopment-pickles,ketchuporsauce
8.Novelfoodsproductdevelopment-weaningfoodsandhealthfoods
9.Novelfoodsproductdevelopment-instantfoods,RTEorRTS
10.Instrumentalanalysis-colour;viscosity
11.Selectionofproduct,preparation,standardization&quantitycooking
12.Selectionofpackingmaterial,labelling,costevaluationandsale
13.marketandconsumer survey

TextBooks:

1. SudhirGupta(2007)HandbookofPackagingTechnology, Engineers India Research Institute, New Delhi
2. Khanaka,S.S.,EntrepreneurialDevelopment,S.ChandandCompanyLtd,New Delhi, 2006.

ReferenceBooks:

1. Suja,R.Nair(2014)ConsumerBehaviourandMarketing Research, 1st Edition, Himalaya Publishers.
2. Hmacfie,(2007)ConsumerledFoodProductDevelopment,WeedheadPublishing Ltd., UK
3. Fuller,Gordon,W(2005)NewFoodProductDevelopment,2nd Edition, CRC Press, Boca Raton, Florida,
4. Schaffner.D,J,Schroder,W.R.(2010)FoodMarketingandInternati onalPerspectives,Web/McGraw Hill Publication

EvaluationPattern:

Internal(CA)	External	Total
80	20	100

*CA–Regular Labworkassessment

FOODSERVICEMANAGEMENTPRACTICAL

SemesterV	**Hoursof Instruction/week–3**
CourseCode:25FSN382	**No.ofCredits–1**
L-T-P – 0-0-3-1	**Total 45hrs**

Prerequisite: Foodservice,foodproduction,menuplanning,purchase,storage,Institutionalfoodservice.

CourseObjectives:

1. Tomakeanunderstandingtheapproaches,tools,managementandresourcesofinstitutionalfoodservice.
2. Tolearnplanningandorganizingspace.
3. Tolearntheprinciplesoffood,personalandhygienemanagement.

CourseOutcome:

CO1:Gainexperienceinprinciples,designingandfunctioningoffoodserviceandhospitalservicesystem. CO2: Apply knowledge on Family meal & functions menu & service planning
CO3:Acquiretechnicalskillsinfoodservicemanagementandhospitalitymanagement.

Skills: Developskillsinbulkfoodproductionandinstitutionalfoodservice.

CO-POMapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	2	-	1	3	-	2	1	-	2	1
CO2	2	2	-	1	3	-	1	1	-	2	1
CO3	2	2	-	1	3	-	1	1	-	2	1

Practical's **30hrs.**

1. Layout planningfordifferentfoodservicesystem.
2. Learntosetupdifferentstylesoffood service
3. Familymeal&functionsmenu&serviceplanning
4. Layout planforhospital dietaryservice
5. Qualitystandardsandcontrol
6. Processofstandardizationof recipes
7. Portioncontrol:Managementofleft-over foods.
8. Creatinggoodambianceinfoodservice(Interior decoration)
9. Informalandformalservicestyles(TableService)
10. Traditionalfoodservicesystems
11. RolesandResponsibilitiesoffrontofficeandhouse keeping

ReferenceBooks:

1. MohiniShetty,Institutionalfoodmanagement,NewageInternationalPublishers,2016.
2. West,BB,Wood“FoodserviceinInstitutions”,Johnwiley&Sons,NewYork
3. KhanMA“Foodserviceoperations”,AVIpublishingCompanyInc.1987.
4. SethiandMahanS.-CateringManagementandintegratedapproach,Johnwiley&Sons,NewYork .
5. KotasRandDavisB“foodcostcontrol”Billing&SonsLtd,GreatBritian,1976
6. Dr.B.K.Chakravati,“ATechnicalguidetoHoteloperation”,Metropolitan,NewDelhiIndia.
7. EarlR.PalanandJudityA.Stadler(1986)PreparingforthefoodserviceIndustry,AVI-Publishing&co
8. MickeyWarner(1989)RecreationalfoodserviceManagementVanNostrandReinhold,Newyork.
9. J.M.Diwan(1997)CateringandfoodserviceManagement,CommonWealthpublishers.
10. TerselMCandHarger–Professionfoodpreparation,Johnwiley&Sons,NewYork

EvaluationPattern

Internal(CA)	External	Total
80	20	100

*CA–Regular Labworkassessment

23LSK301	LifeSkills III	L-T-P-C:1-0-2-2

Pre-requisite: TeamSpirit,self-confidenceandrequiredknowledge,basicEnglishlanguageskills, knowledgeofhighschool level mathematics.

CourseObjective: Tohelpstudentsunderstandthenuancesofleadership,knowtheimportanceofworkinginteams,face challenging situations, crack interviews, improve communication skills and problem-solving skills.

CourseOutcomes

CO1: Soft Skills - To acquire the ability to work in teams, present themselves confidently and showcase their knowledge, skills,abilities,interests,practicalexposure,strengthsandachievementstopotentialrecruitersthrougharesume,videoresume, and personal interview.

CO2:SoftSkills-Tohavebetterabilitytoprepareforfacinginterviews,analyseinterviewquestions,articulatecorrect responsesandrespondappropriatelytoconvincetheinterviewerofone'srightcandidaturethroughdisplayingetiquette, positive attitude and courteous communication.

CO3:Aptitude -Tomanagetime whilearrivingatappropriatestrategiestosolvequestionsingeometry, statistics,probability and combinatorics.

CO4: Aptitude - To analyze, understand and applysuitable methods to solve questions on data analysis and data sufficiency.

CO5:Verbal-Tousedictionthatislessverboseand morerefinedandto usepriorknowledgeofgrammartocorrect/improve sentences.

CO6:Verbal-Tounderstandarguments,analyzeargumentsanduseinductive/deductivereasoningtoarriveatconclusions.To be able to generate ideas, structure them logically and express them in a style that is comprehensible to the audience/recipient. **Skills:** Communication, teamwork, leadership, facing interviews and problem-solving.

CO-POMapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	2	3	3	-	3
CO2	-	-	-	-	-	-	-	2	3	3	-	3
CO3	-	3	-	-	-	-	-	-	-	-	-	3
CO4	-	3	-	-	-	-	-	-	-	-	-	3
CO5	-	-	-	-	-	-	-	-	-	3	-	3
CO6	-	-	-	-	-	-	-	-	3	3	-	3

Syllabus

SoftSkills

Team Work: Value of teamwork in organizations, Definition of a team. Why team? Effective team building. Parameters for a good team, roles, empowerment and need for transparent communication, Factors affecting team effectiveness, Personal characteristics of members and its influence on team. Project Management Skills, Collaboration skills.

Leadership: Initiatingandmanagingchange,Internalproblemsolving,Evaluationandco-ordination,Growthandproductivity, Importance of Professional Networking.

Facing an interview: Importance of verbal & aptitude competencies, strong foundation in core competencies, industry orientation / knowledge about the organization, resume writing (including cover letter, digital profile and video resume), being professional. Importance of good communication skills, etiquette to be maintained during an interview, appropriate grooming and mannerism.

Aptitude

Geometry:2D,3D,CoordinateGeometry,andHeights&Distance.

Permutations&Combinations: Basics,FundamentalCountingPrinciple,CircularArrangements,andDerangements.

Probability: Basics,Addition&MultiplicationTheorems,ConditionalProbabilityandBayes'Theorem.

Statistics: Mean,Median,Mode,Range,Variance,QuartileDeviationandStandardDeviation.

Data Interpretation: Tables, Bar Diagrams, Line Graphs, Pie Charts, Caselets, Mixed Varieties, and other forms of data representation.

DataSufficiency: Introduction,5OptionsDataSufficiencyand4OptionsDataSufficiency.

Campusrecruitmentpapers: DiscussionofpreviousyearquestionpapersofallmajorrecruitersofAmritaVishwaVidyapeetham.

Miscellaneous: InterviewPuzzles,CalculationTechniquesandTimeManagementStrategies.

VerbalSkills

Vocabulary: Createanawarenessofusingrefinedlanguagethroughidiomsandphrasalverbs.

Grammar(AdvancedLevel): Enablestudentstoimprovesentencesthroughaclearunderstandingoftherulesofgrammar.

ReasoningSkills: FacilitatethestudenttotaphisreasoningskillsthroughSyllogisms,andcriticalreasoningarguments.

ReadingComprehension(Advanced):Enlightenstudentsonthedifferentstrategiesinvolvedintacklingreading comprehension questions.

PublicSpeakingSkills:Empowerstudents toovercomeglossophobiaandspeakeffectivelyandconfidentlybeforeanaudience.

WritingSkills:Practiceclosetteststhatassessbasicknowledgeandskillsinusageandmechanicsofwritingsuchaspunctuation, basicgrammarandusage,sentencestructureandrhetoricalskillssuchaswritingstrategy,organization,andstyle.Practiceformal written communication through writing emails especially composing job application emails.

References:

1. Adair.J.,(1.986),"EffectiveTeamBuilding:Howtomakeawinningteam",London,U.K:PanBooks.
2. Gulati.S.,(2006)"CorporateSoftSkills",NewDelhi,India:Rupa&Co.
3. TheHardTruthaboutSoftSkills,byAmazonePublication.
4. VerbalSkillsActivityBook,CIR,AVVP
5. Nova'sGREPrepCourse,JeffKolby,ScottThornburg&KathleenPierce
6. TheBBCandBritishCouncilonlineresources
7. OwlPurdueUniversityonlineteachingresources
8. www.thegrammarbook.comonlineteachingresources
9. www.englishpage.comonlineteachingresourcesandotherusefulwebsites
10. StudentWorkbook:QuantitativeAptitude&Reasoning,Corporate&IndustryRelations,AmritaVishwa Vidyapeetham.
11. QuantitativeAptitudeforAllCompetitiveExaminations,AbhijitGuha.
12. HowtoPrepareforQuantitativeAptitudefortheCAT,ArunSharma.
13. HowtoPrepareforDataInterpretationfortheCAT,ArunSharma.
14. HowtoPrepareforLogicalReasoningfortheCAT,Arun Sharma.
15. QuantitativeAptitudeforCompetitiveExaminations,RSAggarwal.
16. AModernApproachtoLogicalReasoning,RS Aggarwal.
17. AModernApproachtoVerbal&Non-VerbalReasoning,RSAggarwal.

EvaluationPattern

Assessment	Internal	External
ContinuousAssessment(CA)*–SoftSkills	30	-
ContinuousAssessment(CA)*–Aptitude	10	25
ContinuousAssessment(CA)*–Verbal	10	25
Total	50	50

*CA-Canbe**presentations,speakingactivitiesandtest**

LIVE-IN-LAB

COURSECODE:25FSN390	**L-T-P-C:0-0-3-3**

CourseObjective:

- Proposalwritinginordertobringinadetailedprojectplanning,enlistthematerialsrequired and propose budget requirement.
- UsetheconceptofCoDesigntoensureUserParticipationintheDesignProcessinorderto rightly capture user needs/requirements.
- Buildingandtestingaprototypetoensurethatthefinaldesignimplementationissatisfiesthe user needs, feasible, affordable, sustainable and efficient.
- Realtimeprojectimplementationinthevillagefollowedbyawarenessgenerationandskill training of the users (villagers)

CourseOutcome

CO1: Learnco-designmethodologiesandengageparticipatorilytofinaliseasolution
CO2: Understandsustainablesocialchangemodelsandidentifychangeagentsinacommunity.
CO3: LearnProjectManagementtoeffectivelymanagetheresources
CO4: Labscaleimplementationandvalidation
CO5. Prototypeimplementationofthesolution

CO-POMapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	3	3		3		3
CO2	2	3	3		3		3
CO3	2	3	3		3		3
CO4	2	3	3		3		3
CO5	2	3	3		3		3

Syllabus

Thestudentsshallvisitvillagesorruralsitesduringthevacations(after6thsemester)andifthey identify a worthwhile project, they shall register for a 3-credit Live-in-Lab project, in the fifth semester.
ThematicAreas

- Agriculture&RiskManagement
- Education&GenderEquality
- Energy&Environment
- Livelihood&SkillDevelopment
- Water&Sanitation
- Health&Hygiene
- WasteManagement&Infrastructure

EvaluationPattern

Assessment	Marks
Internal(ContinuousEvaluation)[63marks]	
1.Proposed Implementation	**2**
PresentationRound 1	
2.ProposalSubmission+Review	**6**
3.Co-design	**6**
i. VillageVisitI(Co-Design FieldWorkAssignments)	4
ii. PresentationofCo-designAssessment	2
4.PrototypeDesign	**14**
i. PrototypeDesign	4
ii. PrototypeSubmission	8
iii. SustenancePlan	2
5. Implementation	**35**
i. ImplementationPlanReview	3
ii. Implementation	24
iii. Testing&Evaluation	4
iv. SustenanceModel Implementation	4
External[37Marks]	
6.ResearchPaper	**18**
7.Final Report	**15**
8.PosterPresentation	**4**
Total	**100**

SEMESTER VI

COMMUNITYNUTRITION

SemesterVI	**HoursofInstruction/week –4**
CourseCode:25FSN311	**No.of Credits–4**
L-T-P – 3-1-0-4	**Total60 hrs.**

CourseObjectives:

1. Understandvariousnutritional problemsprevailinggloballyandinIndiacommunities
2. Gaininsightonvariousnutritionalorganizationscombatingmalnutrition
3. Applythe principles of supplementaryfeedinginterventions incommunity

CourseOutcomes:

1. Understandthebasicconceptsof communitynutritioninglobalized world
2. Gainknowledgeon nutritional problems ofthe communitywith itsnutritionalrecommendations
3. Leanskills forassessing nutritional statusinthe community
4. Acquireskills onstrategies tocombatnutritional problems

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	1	1	-	3	1	1	-	-	1
CO2	1	-	1	1	-	-	1	1	-	-	1
CO3	-	-	1	-	-	3	1	1	-	-	1
CO4	-	-	1	1	-	3	1	1	-	-	1

Syllabus:

UnitI–CommunityNutrition-AnOverview **14 Hrs.**

Community nutrition- Definition. Role of nutrition in community development. Methods of improving nutritional quality. Nutritional and infection interrelationship. Present trends and focus on community nutrition.

UnitII–NutritionalProblemsofthe Community **14Hrs.**

NutritionalProblems-PEM,obesity,vitaminAdeficiencdiseases,anaemia,iodinedeficiencydisorders,fluorosis andlifestyledisorders.Malnutrition-Definition,prevalence,causes,consequences.Ecologicalfactorsleadingto malnutrition. Vicious cycle of malnutrition. Strategies to overcome malnutrition. Nutritional recommendations during nutritional deficiencies, disorders and pandemic. Principles of planning diets during malnourishment. Complementary Nutrition. Role of functional foods in health promotion and disease prevention.

UnitIII-Assessmentof Nutritional Status **14hrs.**

Different methods for assessing nutritional status. Direct methods- Anthropometric assessments, biochemical assessments, clinical observations, dietary assessments. Indirect methods- economic factors, cultural and social factors, ecological variables, vital health statistics and other records.

UnitIV-StrategiestoCombatNutritionalProblems **14hrs.**

Strategies to mitigate nutritional problems**.** FoodSecurity and Nutritional security- concept and measurement. Factors affecting food security and nutritional security. Management of food insecurity-Food Fortification and enrichment.GovernmentalPoliciesandProgrammes-FoodAssistanceandFoodSupplementationProgrammes- Public Distribution System (PDS), Food For Work (FFW), Special Nutrition Programme (SNP), School Lunch Programme (SLP), Mid DayMeal Programme(MMP), Balawadi Nutrition Programme (BNP), Integrated Child Development Services (ICDS). Nutrition Education - Importance - Approaches Media and Methods.

TextBooks:

1. Textbookof communitynutrition,6 th edition, bydr. Suryatapadas, 2023.
2. CommunityNutrition byVSrilakshmi,B;Suganthi ,2022
3. CommunityNutritionand HealthbyBhavanaSabarwal,2023
4. FoodNutritionandCommunityHealth,Dr.VikasSingh&Dr.Gyanendrakumar,2020
5. BoyleM.A.(2021).CommunityNutritioninAction.8th Edition.Cengage Learning,USA.
6. SteynN.andTempleN.J.(2016).CommunityNutritionforDevelopingCountries.AthabascaUniversityPress, Canada.

ReferenceBooks:

1. Nutrition-ConceptsandControversies,bySizer F.S.andWhitney E,15thEdition,2016, Wadsworth Cengage Learning, USA.
2. UnderstandingNutrition,byWhitneyE.andRolfesS.R,11thEdition,2018,Wadsworth Cengage Learning, USA.

EvaluationPattern

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

ANALYTICALINSTRUMENTATION

SemesterVI	**Hoursof Instruction/week–2**
CourseCode:25FSN312	**No.ofCredits–2**
L-T-P – 2-0-0-2	**Total30 hrs.**

Prerequisite: Basicknowledgeoninstrumentsusedinfoodanalysis

CourseObjectives:

1. Tocreateawarenessondifferentanalyticaltechniquesusedinfoodanalysis
2. Togiveanunderstandingontheprinciplesandapplicationsofvariousanalyticalinstrumentsusedinfoodanalysis.

CourseOutcomes:

CO1:Familiarizedtovariousinstrumentaltechniquesinfoodanalysis
CO2:Understandtheprinciplesandapplicationsofchromatographicmethods CO3:
Familiarize with hyphenated techniques in chromatography
CO4: Gain knowledge in spectroscopic methods used in food analysis
CO5:Understandtheprinciplesandapplicationsbehindthermalanalysis

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	-	-	1	-	-	3	-
CO2	2	1	-	-	-	-	1	-	-	3	-
CO3	2	1	-	-	-	-	1	-	-	3	-
CO4	2	1	-	-	-	-	1	-	-	3	-
CO5	2	1	-	-	-	-	1	-	-	3	-

Syllabus:

UnitI-IntroductiontoFoodAnalysis **5hrs.**
NeedforfoodanalysisneedforInstrumentationinFoodAnalysisCriteriaforSelectingaTechnique, Instrumental Techniques in Food Analysis, Transition of food analysis.

UnitIIChromatographicTechniques **7hrs.**
GaschromatographyLiquidchromatographyThinLayerChromatographyHighPerformanceThinLayer Chromatography – Principles and applications

UnitIIIHyphenatedTechniques **6hrs.**
GasChromatography-MassSpectrometry(GC-MS)LiquidChromatography-MassSpectrometry(LC-MS)- – Principles and applications- Principles and applications.

UnitIV-SpectroscopicTechniques **6hrs.**

Visible Spectroscopy, Atomic-Absorption Spectroscopy (AAS), Inductively Coupled Plasma – Optical Emmission Spectrophotometry (ICP-OES/MS), Nuclear Magnetic Resonance Spectroscopy (NMR),Fourier Transform Infrared Spectroscopy (FT-IR) –Principles and applications.

UnitVThermalMethodsofAnalysis **6hrs.**

Thermogravimetry, Differential Thermal Analysis (DTA), Differential Scanning Calorimetry (DSC) – principles and applications

Activity

1. VisittoNABLaccredited lab.

Textbooks:

1. ManualinInstrumentationinFoodAnalysis**,**IGNOUUniversity
2. HandbookofAnalyticalInstruments,3rdedition,McGraw-HillEducation–Europe,ISBN: 9780070604605, R.S. Khandpur, 2015.

EvaluationPattern:

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODPRODUCTEVALUATION

SemesterVI	**Hoursof Instruction/week–2**
CourseCode:25FSN313	**No.of Credits–2**
L-T-P – 1-1-0-2	**Total30 hrs.**

Prerequisite: Basicknowledgeonfoodproductevaluation

CourseObjectives:

1. Togiveabetterknowledgeaboutdifferenttechniquesforfoodproductdevelopmentandevaluation
2. Tocreateinsightsonvariousmethodsofevaluatingthequalityandsafetyoffoods.

CourseOutcomes:

CO1:Gainknowledgeontheimportanceofevaluationoffoodquality
CO2:Interprettheevaluationtechniquesandtestsusedinanalyzingfoodquality CO3:
Identify the sensory characteristics of different foods
CO4:Understandthephysical,chemicalandmicroscopicmethodsusedintheevaluationoffoodquality

Skills: Developskillsinfoodproductdevelopmentandevaluation

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	3	-	1	-	-	1	1	-	3	1
CO2	1	3	-	1	-	-	1	1	-	3	1
CO3	1	3	-	1	-	-	1	1	-	3	1
CO4	1	3	-	1	-	-	1	1	-	3	1

Syllabus:

UnitI-IntroductiontoFoodEvaluationQuality **7hrs.**
Definition,ObjectivesandNeedforEvaluationofFoodQuality
FactorsAffectingtheEvaluationofFoodQuality–PsychologicalandPhysiological

Unit II Methods of Evaluation of Food Quality – Subjective Methods **8hrs.**
Sensory Characteristics of Food - Appearance, Colour, Flavour, Taste, Texture and Consistency, Conducting SensoryTests–TrainingPanelMembers,TestingLaboratory–PreparationofSamples,TechniquesofSmelling and Tasting, Testing time, Reasons for Testing Food Quality
Tastingprocedures-Chewing,nibbling,slurping,mouthrinsing
OrganolepticEvaluation-Flavour,Colour,Clarity,Viscosity,texture,smellingprocedures

Unit IIISensory Tests used for Food Evaluation **8hrs.**

TypesofTests,DifferenceTests,RatingTests,SensitivityTests,DescriptiveTests,Interpretationofscores, Application of softwares in interpreting scores

Thresholdtests-Absolute,Recognition,Differential,Terminal

Discriminationtests-pairedcomparison,duotriodifference,triangulardifference,singlesampletest,two alternative forced choice test

Descriptivetests-Simpledescriptive,Descriptivewithrating,Flavourprofile,Dilutionprofiletechnique

UnitIV-MethodsofEvaluationofFoodQuality–ObjectiveMethods **7hrs.**

Basic Guidelines, Advantages and Disadvantages, Tests Used, Chemical, Nutritional Analysis & Evaluation (Labelling infromation) Physio-chemical, Microscopic, Physical Method- grading, Instruments used for Evaluation.

Textbooks:

1. Srilakshmi,B.SecondEdition,Food Science,New AgeInternational(P)LimitedPublishers,New Delhi. 2023
2. HarryT.Lawless,Hildegarde,SensoryEvaluationofFoodPrinciplesandPractices,SecondEdition, Springer Science, 2010.
3. Joshi,V.KSensoryScience:PrinciplesandApplicationsinFoodEvaluation,2016.

Referencebooks:

1. Hutenwigs,B.J.FoodColorandAppearance,PublishedbyBlackieAcademicandProfessional, London, 2010.
2. HowardR.Beckley,Jacquiline,H.SensoryandConsumerResearchinFoodProductDesignand Development, 2016
3. Bi,Jian,SensoryDiscriminationTestsandMeasurements:StatisticalPrinciples,ProceduresandTables, 2016.

EvaluationPattern:

Assessment	Internal	External Semester
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

RESEARCHMETHODOLOGYANDBIO STATISTICS

SemesterVI	**HoursofInstruction/week–4**
CourseCode:25FSN314	**No.ofCredits– 4**
L-T-P – 2-2-0-4	**Total60hrs.**

CourseObjectives:

1. Understanddifferenttypesofresearch,meritsanddemeritsofeachresearch types
2. Analysethecompetenceforselectingmethodsandtoolsappropriateforcarryingout experimental research
3. Developaresearchproposalandevaluatestatisticalmethodstoassesstheoutcomeofthe research

CourseOutcomes:

CO1:Understandthepurpose**,**types,designsandhypothesisofresearch
CO2: Analyse systematic methods for data collection, data processinganddataanalysisCO3:Designaresearchproposalinthe appropriate scientific style
CO4:Developskillsforscientificresearchwritingbasedoncriticalinterpretation.
CO5:Interprettheresultsofstatisticalanalysisofdataandsummarizedatausingtabulationand graphs.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	1	-	-	-	1	-	-	-	-	-
CO2	-	1	-	-	-	1	-	-	-	-	-
CO3	-	-	-	-	-	1	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-

Syllabus:

Unit I - Research Types, Designs and Hypothesis **12 Hrs**

Research–Types,objectives,approachesandsignificance.Researchprocess,Criteriaofgood research,Researchdesign-Types,characteristicsandsignificance.Basicprinciplesof experimentaldesigns.NutritionInterventionstudies–pilotstudy,randomizedcontrolledtrial, nutritionalbiomarkers.Researchhypothesis-NullHypothesisandAlternativeHypothesis, Type IandType IIErrors. Testingofhypothesis. Characteristics of good hypothesis.

Unit II- Methods of Data Collectionand Sampling designs **12 Hrs**

Methodsofdatacollection-Primaryandsecondarydata,Selectionofappropriatemethodfor data collection.

Samplingdesigns-Probabilitysampling*and*Non-probabilitysampling.SamplingandNon-samplingErrors. Measurement and Scaling techniques- Quantitative and Qualitative Data, Goodness of Measurement Scales.

UnitIII-BioStatisticsandDescriptiveMethods **12 Hrs**

BioStatistics-Conceptanditsscopeinpublichealthresearch.Descriptivemethods,Measuresof centraltendency

- Arithmetic mean, median and mode. Measures of dispersion- Range, Mean Deviation and Standard Deviation. Measures of Skewness and Kurtosis. Measures of Relationship-Covariance, Karl Pearson's Coefficient of Correlation and Rank Correlation.

Unit IV- Processing and Analysis of Data **12 Hrs**

ProcessingOperations.ProblemsinProcessingdata.Analysisofdata-Elementsofdata analysis,statisticalmeasures inResearch-Student'st-test,Analysisofvariance-Oneway ANOVAandtwowayANOVA.Duncan'stest.Multivariateanalysisofvariance(MANOVA), Chi-square testandRegressionAnalysis.Biostatisticswithstatistical software- MS-Excel, SPSS, Graph pad prism software and other statistical calculators available in web.

Unit V-Interpretation and Scientific Research Writing **12 Hrs**

Interpretation-TechniquesandPrecautions.PreparationofaResearchProposal.Report Writing-steps, typesandsignificance.MechanicsandPrecautionsforWritingaResearch Report.Presentationofresearchreport-Tabulationandorganizationofdata,Graphicalpresentation of data.

Text Books:

1. KothariC.R.(2019),ResearchMethodology:MethodsandTechniques4th Edition, New Age International Publishers, New Delhi.
2. PounisG.(2018),AnalysisinNutritionResearch:PrinciplesofStatistical Methodology and Interpretation of the Results,Academic Press Publishers, USA.

ReferenceBooks:

1. TrochimW.,DonnellyJ.P.andAroraK.,(2015),ResearchMethods:TheEssential Knowledge Base, Cengage Learning. USA.
2. BlaxterL,HughesCandTightM(2010),HowtoResearch–4th edition.McGrawHill UK.

EvaluationPattern:

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Seminar,ProjectsandReports.

FOODANALYSISPRACTICAL

SemesterVI	**Hoursof Instruction/week–3**
CourseCode:25FSN383	**No.ofCredits–1**
L-T-P – 0-0-3-1	**Total45 hrs.**

CourseObjectives:

1. Tocreatelearningonthequalitativeandquantitativeanalyticaltestsinfoods.
2. Togiveabetterunderstandingontheprinciplesofreactionintheidentificationofnutritionalconstituentsof foods.

CourseOutcomes:

CO1:Acquireknowledgeondifferentanalyticaltechniquesassociatedwithfoodsamples

CO2:Gainhandsonexperienceinqualitativeandquantitativeestimationsofproximateconstituents.

Skills: Acquireskillstoquantifyproximatenutrientsinfoods

CO-POMapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	-	3	-	1	2	-	3	-
CO2	2	-	-	-	3	-	1	2	-	3	-

Practical's: **30hrs.**

S.No.	ListofExperiments
1.	DeterminationofMoisturecontentofdifferentfoodsamples
2.	QualitativeanalysisofCarbohydrates,Proteins,FatsandOilsingivenfoodsamples
3.	EstimationofTotalSugarsusingAnthroneMethod
4.	EstimationofProteinsusingBiuret method
5.	DeterminationofCrudeFatusingsoxhletextractionmethod
6.	EstimationofMinerals-Calcium,PhosphorusandIroninthefoodsamplesusingSpectrophotometric Methods
7.	EstimationofVitamins-VitaminAandVitaminCandinthefoodsamplesusingSpectrophotometric andDichloroindophenolTitrimetricMethods

TextBooks:

1. Sadasivam,S.andManickam,A.BiochemicalMethod,4thEdition,NewAgeInternationalP.Ltd., Publishers, New Delhi, 2022.
2. Oser,B.L.,Harke'sPhysiologicalChemistryXIVEditionTataMcGrawHillPublishingCompany Ltd., Bombay, 2011.

ReferenceBooks:

1. Raghuramulu,N.,Madhavannair,K.andKalyanaSundaram,NationalInstituteofNutrition,2013,A Manual of Laboratory Techniques, Hyderabad, 500007
2. Varley,H.,Gowenlak,A.H.andHill,M.PracticalClinicalBiochemistry,WilliamItinmaonMedical Books, London, 2010

EvaluationPattern

Internal(CA)	External	Total
80	20	100

*CA–Regular Labworkassessment

SEMESTER VII

PUBLICHEALTHNUTRITION

SemesterVII	**HoursofInstruction/week–4 No.**
CourseCode:25FSN401	**of Credits – 4**
L-T-P–C 2-2-0-4	**Total60 hrs.**

CourseObjectives:

1. Gaininsightintothepublichealthproblemsandtheirimplications
2. Acquireskillsinorganizingandevaluatingnutritionprojectsinthecommunity
3. Appreciatethenationalandinternationalcontributiontowardsnationaldevelopment

CourseOutcomes:

CO1:Understandthebasicconcepts ofpublichealthnutrition
CO2:Gainknowledgeinassessingandevaluatingnutritionalepidemiologicalstudies CO3:
Design strategies and approaches for managing public health problems
CO4:Gaininsightintonationalandinternationalorganizationstocombatmalnutrition

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	1	-	-	-	1	-	1	-	-	-
CO2	-	1	-	-	-	1	-	2	-	-	-
CO3	-	2	-	-	-	1	-	-	-	-	1
CO4	-	1	-	-	-	-	2	-	-	-	1

Syllabus:

UnitI-PublicHealth Nutrition-AnOverview 14Hrs

Public health nutrition -Concept and importance. Concept of health and disease. Dimensions, determinants and indicators of health. Public health and nutritional issues- Global and Indian perspectives. Health care system in India. Role of public nutritionist in health care delivery.

UnitII-Nutritional Epidemiology 14Hrs

Epidemiology –Concept, approaches, types and significance. Principles of Nutritional Epidemiology. Measurement issues. Epidemiology of communicable and non-communicable diseases. Design and planning of nutritional epidemiological studies- Assessing and evaluating epidemiological studies.

UnitIII-PublicHealthNutrition -StrategiesandApproaches 16Hrs

Global and national public health nutrition approaches. Theories of behaviour change and their application to publichealthnutrition.Developingpublichealthnutritionstrategiesinthecommunity.Evaluationofpublichealth interventions and policies. Formative research approaches to develop malnutrition interventions. Nutrition education- principle, methods and significance in maintaining public health nutrition**.**

Unit-IV:NationalandInternational OrganizationstoCombatMalnutrition16Hrs

Nationalorganizations-ICMR-NIN,ICAR,ICAR,CHEB,CSWB,SSWB,NNMB,CFTRI,DFRL,NFIand NIPCCD.International organizations- FAO, WHO, UNICEF, WFP, CARE, GAIN, AFPRO, CWS, CRS, and World Bank. Economics of Nutrition. Malnutrition and its economic consequences. Food security. Food production and food pricing.

TextBooks:

1. ParkK.(2021).TextbookOfPreventiveAndSocialMedicine,26thEdition.BanarsidasBhanotPublisher, Madhya Pradesh, I**n**dia.
2. ATextBookofPublicHealthNutrition,2022,byDr.ArchanaPrabhat,Ms.AswiniK,Iterative International Publisher IIP.
3. WelchA.A.,KearneyJ.M.,ButtrissJ.L.andLanhamS.A.(2017).PublicHealthNutrition,2nd Edition. Wiley, U.K.

ReferenceBooks:

1. SteinN.(2014).PublicHealthNutrition-PrinciplesandPracticeinCommunityandGlobalHealth.Jonesand Bartlett Learning, LLC Publishers, U.S.A.
2. GibneyM.J.,MargettsB.M.,KearneyJ.M.,ArabL.(2015).PublicHealthNutrition.JohnWileyand Sons, New York.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
End Semester		50

*CA-CanbeQuizzes,Assignment,Seminar,ProjectsandReports.

NUTRACEUTICALSANDFUNCTIONALFOODS

SemesterVII	**HoursofInstruction/week –4**
CourseCode:25FSN402	**No.of Credits–4**
L-T-P – 3-1-0-4	**Total60 hrs.**

Pre-requisite: Nutraceuticals,bioactivecomponents,dietarysupplements,geneticallymodifiedfoods

CourseObjectives:

1. Todevelopcomprehensiveunderstandingofdifferentnutraceuticalsand Functionalfoods,andunderstandthe phytochemical components its potentials and management on health and diseases.
2. Understandingthemolecularlevelinteractionbetweennutrientsandotherdietarybioactivewithhuman genome and be acquainted with the applications of nutrigenomics in wellness and disease management.

CourseOutcomes:

CO1: Understand the basic concepts of nutraceuticals and functional foods.

CO2: Acquire knowledge on the bioactive carbohydrates, peptides and lipids

CO3:Gainknowledgeontheprebiotics,probiotics,synbioticsandpostbiotics CO4:

Comprehend the significance of nutraceuticals on human health.

CO5:Applygood manufacturingpracticesand safetyissuesin functionalfood industries

CO-POMapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	-	-	2	2	2	-	-
CO2	2	2	-	-	-	-	2	2	2	-	-
CO3	2	2	-	-	-	-	2	2	2	-	-
CO4	2	2	-	-	-	-	2	2	2	-	-
CO5	2	2	-	-	-	-	2	2	2	-	-

Syllabus:

Unit I - Nutraceuticals and Functional Foods **12hrs**

Nutraceuticals-definitionandclassification.Functionalfoods:Types-Cerealandcerealproducts;Milkandmilk products;Meat,poultryandseafoods;nutsandoilseeds,Functionalfruitsandvegetables;Herbsandspices;

Beverages. Designer foods. Market demand for nutraceuticals and functional foods. Role of Nutraceuticals inMaternal Nutrition, Medical Foods and Infant Formulas.

Unit II- Bioactive carbohydrates, peptides, lipids **12hrs** Sources and biological activities of bioactive carbohydrates, peptides, lipids. Bioactive carbohydrates from plants, animal products, microorganisms. Biological roles of bioactive carbohydrates- antioxidant, immunomodulatory, antitumor, anti-diabetic, antimicrobial. Sources of bioactive peptides- from meat, dairy, collagen, egg, plant, marine and fungi. Fats and Oils as sources of bioactive molecules.

UnitIII-Prebiotics,Probiotics, SynbioticsandPostbiotics **12hrs**

Prebiotics, probiotics, synbiotics and postbiotics-concept, functions, mechanism of action. Clinical applications of prebiotics, probiotics and synbiotics: gastrointestinal system, respiratory system, cardiovascular system, urinary system, reproductive system, immune system.

UnitIV-RoleofNutraceuticals in Health andDisease **12hrs**

Conceptofdietarysupplements,FOSHUfoods–concepts,regulatoryaspectsFoodcomponent–approvedhealth claims,labelingconsiderationsforfunctionalingredients,Permissibleandimpermissiblefunctionalclaims,Role of biotechnology in the development of functional foods.

UnitV-GoodManufacturingPracticesand SafetyIssuesinFunctionalFood Industries12hrs

HACCP in functional food industries. Product specifications and conformance. Equipment's and maintenance. Safety assessment: nutritional and toxicological. Market of functional foods- Challenges for Functional food delivery, Customer and manufacturer issues- product information and customer awareness. Factors affecting consumer interest.

TextBooks:

1. HandbookofNutraceuticalsandFunctionalFoods,RobertE.C.Wildman,RichardS.Bruno,Taylorand Francis , CRC Publications,2020
2. Mahtab,S,Bamji,KamalaKrishnasamy,G.N.V.Brahmam,TextBookofHumanNutrition,Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2015.
3. Srilakshmi,B.SecondEdition,FoodScience,NewAgeInternational(P)LimitedPublishers,NewDelhi, 2017
4. Simopoulus,A.P.andOrdovas,K.J.M.,2004,NutrigeneticsandNutrigenomics,Vol.93,Karger, Switzerland.

ReferenceBooks:

1. Aluko,Rotimi,Functional FoodsandNutraceuticals,Springer-VerlagNew YorkInc.,2012
2. SatinderKaurBrar,SurinderKaurandGurpreetSinghDhillon,NutraceuticalsFunctionalFoods,2014.
3. Functional Foods and Nutraceuticals, https://www.researchgate.net/publication/343982518_PREFACE_Functional_Foods_and_Nutraceuticals
4. Watson,David,H.,2013,PerformanceFunctionalFoods,CRCPress,WoodHeadPublishingLtd.,England
5. Tamine,A.,2015,ProbioticDairyProducts,BlackwellPublishingLtd.,UK
6. NarasingaRao,B.S.,2015,NutritionResearchinIndia–ACountry Report,Publishedby INSA,New Delhi.
7. Webb,G.P.,2016,DietarySupplementationsandFunctionalFoods,BlackwellPublishingLtd.,NewYork.
8. Tai,E.S.andGillies,P.J.,2007,Nutrigenomics–OpportunitiesinAsia,Karger,Singapore.2013.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODANDNUTRITIONRESEARCHTECHNIQUES

SemesterVII	**HoursofInstruction/week–4**
CourseCode:25FSN403	**No.ofCredits– 4**
L-T-P – 3-1-0-4	**Total60hrs.**

CourseObjectives:

1. Acquireknowledgeon trendsin foodandnutritionalresearch
2. Understandresearchinnovelfoodproductdevelopmentanditssignificanceinhealthpromotionanddisease prevention
3. Gainscientificknowledgeongrowth**,**metabolicandnitrogenbalancestudies inanimalsandhuman trials

CourseOutcomes:

CO1: Understand the basic concepts of food and nutritional research and ethical issues
CO2:Analysedifferent innovativeFood products and its significancein human health
CO3:Acquireknowledgeon significanceofanimals models innutritionalresearch and growthstudiesinanimalmodels
CO4:Design growth,metabolicandnitrogenbalanceresearchusinghumanmodels.
CO5: Apply tools and techniques in manuscript writing and publication ethics

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	-	3	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	-	1
CO3	-	-	-	1	-	-	-	-	-	-	2
CO4	-	-	-	3	-	-	-	-	-	-	2
CO5	-	-	-	3	-	-	-	-	-	-	2

Syllabus:

UnitI- FoodandNutritionalResearchandEthicalIssues 12Hrs

Trendsinfoodandnutritionresearch-GlobalandIndianperspective,Thrustareasinfoodandnutritionalresearch. FoodandNutritionalresearch- Invitroandinvivostudies.Nutritioninterventionstudies-principles,meritsand demerits. Ethical issues in nutritional research- Rights of the research participant, Physical and psychological risks, Ethical issues regarding copyright. Human and animal ethical committees.

UnitII-ResearchinNovelFood ProductDevelopment 12Hrs

Foodproducts-thebasis ofinnovation-3Dfoodprinting,culturedmeats,foodnanomaterials,nanotooledbug boosters. Measures of food products success and failure. Product development process- the basis for success. Prototype. Developing an innovative strategy. Managing and improving product development process. Case studies- product development in food systems.Patent in food sectors. Significance of research in food products development in health promotion and disease prevention.

UnitIII-GrowthStudiesinAnimal Models 12Hrs

Animal models in nutrition research, Need for extrapolation research in animal models. Maintenance of animal laboratory, maintenance of records. Growth and development of rats- role of different protein levels in diet formulation,feedingtechniques,Biologicalassays withanimalmodels-metabolicandnitrogenbalancestudies.

UnitIV-BiologicalAssaysin Human Trials 12Hrs

Research studies among humans-Principles and objectives. Growth studies among infants, children and adolescents-Effect ofsupplementation of different protein sources in managingnutritional status. Metabolic and nitrogenbalancestudiesamongchildren,adolescentsandadultsandinterpretationofresults.Nutritionalresearch in vulnerable sector of society and innovation in dietary supplement delivery.

UnitVManuscriptWritingand Publication Ethics 12Hrs

Manuscript writing-tools and techniques. Manuscript preparation- steps. Guidelines for preparing for publication- Scientific papers writing.Indexed journals-types and its significance. Publication ethics. Perspectives of plagiarism- techniques to avoid plagiarism. Internet plagiarism and Plagiarism detection software-Turnitin,Copyleaks,PlagiarismChecker,DupliChecker,PlagScan,ProWritingAidandWhite Smoke.

TextBooks:

1. BamijiM.S.,RaoP.R.andReddyV.(2017),TextBookofHumanNutritionOxfordandIBFI Publishing Co. Pvt. Ltd., New Delhi.
2. GopaldasT.andSeshadriS.(2015),Nutrition,Monitoringandassessment,OxfordUniversityPress, New Delhi .

ReferenceBooks:

1. WhitneyE.N,andRolfesS.R.(2015).UnderstandingNutrition,11th Edition,Chap.6 and Appendix `J'. Measures of Protein Quality – West Wadsworth.
2. PykeR.L.andBrown.M.L.(2019).NutritionanIntegratedapproach,Chapter15,Wileyeastern Publications, New York.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Seminar,ProjectsandReports.

TECHNIQUESOFEXPERIMENTALNUTRITION

SemesterVII	**HoursofInstruction/week–3**
CourseCode:25FSN481	**No.ofCredits–2**
L-T-P – 0-0-3-2	**Total30hrs.**

CourseObjectives:

1. Understandthechemicalcompositionofdifferentfoodsusingcolorimetricandspectrophotometricand chromatography techniques
2. Impartknowledgeonqualitativeandquantitativeestimationofnutrients,antioxidantsandphytochemicals in different food samples

CourseOutcomes:

CO1:Acquireknowledgeondifferentanalyticaltechniquesassociatedwithfood samples

CO2:Gainhandsonexperienceinqualitativeandquantitativeestimationsofproximateconstituents, antioxidants and phytochemicals in different food samples**.**

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	-	-	-	-	-	-	-	2	-
CO2	-	-	-	-	-	-	-	-	-	2	-

Practicals:

S.No.	List ofExperiments
1.	Instrumentationtechniques–BrookfieldViscometer,Abbe'sRefractometer,pHmeter, Colorimeter,Spectrophotometerandchromatography-principleand working.
2.	DeterminationofMoisturecontentusinghotairovendrying technique
3.	QualitativeanalysisofCarbohydrates,Proteins,FatsandOilsingivenfoodsamples
4.	EstimationofTotalSugarsusingAnthrone Method
5.	Determinationofreducingsugarsusing Dinitrosalicylic acid(DNSA) Method
6.	EstimationofDietaryFiberusingAOAC Method

7.	EstimationofProteins usingBiuret/Lowrymethod
8.	DeterminationofAminoacidsbySorensen'sFormal Titration
9.	DeterminationofCrudeFatusingsoxhletextractionmethod
10.	DeterminationofTotalash contentusingdryashingandwet ashingmethods
11.	EstimationofMinerals-Calcium, PhosphorusandIroninthefoodsamples using SpectrophotometricMethods
12.	EstimationofVitamins-Vitamin AandVitamin Candin thefoodsamplesusing Spectrophotometricand DichloroindophenolTitrimetricMethods
13.	DeterminationofPhytochemicals -Phytates,OxalatesandTanninsusingAOACMethods
14.	EstimationoftotalantioxidantsusingFRAP(ferricreducing-antioxidantpower)assay-Spectrophotometric Technique**.**

TextBooks:

1. NielsenS.S.(2015),IntroductiontothechemicalanalysisoffoodsCBSPublishersandDistributers,Pvt. Ltd, New York.
2. RangannaS.(2019).Handbookofanalysisandqualitycontrolforfruitsandvegetables,2nd Edition.Tata McGraw Hill, USA.

ReferenceBooks:

1. SuzanneNielsenS.S.(2017).FoodAnalysisLaboratoryManual.Springer,USA.

EvaluationPattern:

Internal(CA)	External	Total
80	20	100

*CA–RegularLabworkassessment

SEMESTER VIII

NUTRITIONINHEALTHANDFITNESS

SemesterVIII	**HoursofInstruction/week–3**
CourseCode:25FSN411	**No.ofCredits–3**
L-T-P – 3-1-0-4	**Total45hrs.**

CourseObjectives:

1. Understandthebasicconceptsofhealth,physicalactivityandphysical fitness
2. Comprehendenergymetabolismin physicalactivityandweightmanagement
3. Gainknowledgeonsignificanceofnutritioninhealthand fitness

CourseOutcomes:

CO1:Understandthecomponents,evaluationandhealthbenefitsofphysicalfitness CO2: Gain scientific knowledge on energy metabolism during physical activity CO3:AcquireknowledgeonNutritionalrecommendationsduringexercisesandergogenicaids CO4: Analyse biological effect of physical fitness on health status and managing diseases.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	1	-	-	-	-	2	-	2	-	-
CO2	-	1	-	-	-	-	1	-	1	-	-
CO3	1	1	-	-	-	-	2	-	3	-	-
CO4	1	2	-	-	-	-	3	-	3	-	1

Syllabus:

Unit I- Health, Physical Activity and Physical Fitness **11Hrs**

Health- definition and dimensions. Spectrum of health. Physical activity- Concept, types, health benefits and recommendations.Exercise- concept and types, Physical Fitness- Components, principles and evaluation of physical fitness, FITT Principles. Energy Systems and fuels to support physical activity.

UnitII-EnergyMetabolisminPhysicalActivityandWeightManagement **11Hrs**

Energyhomeostasisinthecell. Integrationofcarbohydrate,protein andfat metabolism.MuscleATPproduction during exercise- Aerobic and Anaerobic metabolic pathways. Energy requirements based on physical activity. Components and assessment ofenergyexpenditure. The Fed-Fast cycle. Regulation of energybalance and body

weight. Health implications of altering body weight. Interrelation between Physical activity and weight management.

UnitIII-NutritionalRecommendationandPhysical Fitness 11Hrs

Nutritionalrequirements duringexercises-Carbohydrate,protein,fat,vitaminsandmineralsrecommendations. Fluidsand electrolytes tosupportphysicalactivity.Dietsforphysicallyactivepeople. Ergogenicaids-nutritive and non-nutritive aids, merits and demerits of ergogenic aids.

Unit-IV:PhysicalActivityand DiseasePrevention 12 Hrs

Physiologicalandbiologicaleffectofphysicalfitnessonhealthstatusandvitalsystems.Roleofphysicalactivity andexerciseonprevention and managementofcardiovasculardiseases,obesity, cancer,diabetes, healthyaging, musculoskeletal health, cognitive health and degenerative diseases.

TextBooks:

1. AJacksonA.W.,MorrowJ.R.,DishmanR.K.,HillD.(2015).PhysicalActivityforHealthandFitness. Human Kinetics,USA.
2. GropperS.S.,Jack L.SmithJ.L.,CarrT.P.(2018).AdvancedNutritionandHumanMetabolism7th Edition. Cengage Learning, USA.

ReferenceBooks:

1. WhitneyE.N,andRolfes S.R.(2015).UnderstandingNutrition,11thEdition,Chap.6andAppendix`J'. Measures of Protein Quality – West Wadsworth.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
End Semester		50

*CA-CanbeQuizzes,Assignment,Seminar,ProjectsandReports.

PROFESSIONALELECTIVES

ELECTIVESA(SEMESTERIII&VII)

FOODHYGIENEANDSANITATION

Semester: III & VII	**HoursofInstruction/week–3**
CourseCode:25FSN331	**No.of Credits–3**
L-T-P – 3-0-0-3	**Total45 hrs.**

Prerequisite: Foodsafety,Hygiene,WASH

CourseObjectives:

1. Understandthebasicsof food hygiene
2. Understandthe conceptsofsafeandeffectivesanitation practices
3. Understandthesanitaryaspectsof water.

CourseOutcome:

CO1:Understandthefoodhygieneandsanitationmeasurestocontrolthespreadofmicroorganisms. CO2: Interpret the sanitary aspects of water supply from its source to purification
CO3:Applythevariouscleaningpractices involved insanitation
CO4:Acquirethebasicfundamentals ofsanitationpracticesfollowedinfood industry
CO5:Gainknowledgeonthesafetymeasurementsandprecautionstakenforinsects/pest control.

Skills: Develop skillsinmaintainingsanitarypractices in foodindustry

CO-POMapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-	1	1	1	-	-	1	-
CO2	3	-	-	-	1	1	1	-	-	1	-
CO3	3	-	-	-	1	1	1	-	-	1	-
CO4	3	-	-	-	1	1	1	-	-	1	-
CO5	3	-	-	-	1	1	1	-	-	1	-

Syllabus:

UnitI-Food hygiene **9hrs.**

Generalprincipleoffoodhygiene.Hygieneinruralandurbanareasinrelationtofoodpreparation,personal hygiene and food handling habits. Sanitary aspects of building and equipment, Plant layout and design.

UnitII-Sanitaryaspectsofwater supply **9hrs.**

Sourceofwater,qualityofwater,watersupplyanditsusesinfoodindustries.Purificationand disinfection of water, preventing contamination of potable water supply.

Unit III -Cleaning practices **9hrs.**

Effectivedetergencyandcleaningpractices:Importanceofcleaningtechnology,physical and chemicalfactorsincleaning,classificationandformulationofdetergentsandsanitizers,cleaningpractices.

UnitIV-Sanitation practices **9hrs.**

Sanitary aspects of waste disposal. Establishing and maintaining sanitary practices in food industry, sanitationprincipleandtherequirementsforafoodsanitationprogram,roleofsanitation,generalsanitary consideration.

UnitV-Safeandeffectiveinsectandpestcontrol **9hrs.**

Extraneousmaterialsinfoods,Physicalandchemicalmethodsofcontrolofpestsandinsects.Effective control of micro-organisms: microorganisms important in food sanitation, micro-organisms as indicator of sanitary quality.

References:

1. GuidetoImproveFoodHygiene-GastonandTiffney,3rdEdition,2021
2. PracticalFood Microbiology&Technology-HarryH. Weiser,Mountney,J.and Gord, W.W.,2021
3. PrinciplesofFoodSanitation-MarriottandNorman,G.6thedition2018

EvaluationPattern

Assessment	**Internal**	**External**
Periodical1&Periodical2/ Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment, Projects, andReports,and Seminar

ADOLESCENCEHEALTHANDLIFESTYLE

Semester: III & VII	**Hoursof Instruction/week–3**
CourseCode:25FSN332	**No.of Credits–3**
L-T-P – 3-0-0-3	**Total 45 hrs**

Pre-requisite: Health,Lifestylechanges,adolescenceneeds.

CourseObjectives:

Thiscoursewillprovidebetterunderstandingofsignificanceinadolescent'shealthandnutritionandrelationshipbetween lifestyle practices and health outcomes.

CourseOutcome:

CO1:Expertisestagesofadolescence,significanceofmaintenanceofhealthandnutrition. CO2:
Gained information on the impact of long-term good lifestyle practices on health.
CO3:Knowledgeonpromotionofgoodeatinghabits,physicalactivityandrestingpattern. CO4:
Acquire Knowledge on practicing good personal habits and hygiene.
CO5: Gain knowledge on role of lifestyle practices on mental health.

Skills: Developskillstoovercomelifestylechangesduringadolescence

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-	-	-	2	-	1	-	1
CO2	2	2	-	-	-	-	2	-	1	-	1
CO3	1	1	-	-	-	-	1	-	2	-	1
CO4	-	-	-	-	-	-	1	-	1	-	-
CO5	-	-	-	-	-	-	1	-	1	-	-

Syllabus:

Unit 1 – Introduction to Adolescent Health and Lifestyle **9hrs.**

SignificanceofAdolescentHealth-stagesofadolescence,physical,social,emotional,spiritualandintellectual well-being,sedentarylifestyle,reproductivehealthandfactorsinfluencing,integrationofknowledgeandskills to develop a healthy lifestyle plans, parent's adolescence communication

UnitII–Promotionof GoodEatingHabits **9hrs.**

Foodchoices-SkippingBreakfast-Factors,impactonhealth,MeasurestoovercomeJunkFoodConsumption

-Factors,impactonhealth,MeasurestoovercomeEatingWhiteProducts-Factors,impactonhealth,Measures to overcome Water and Fluid intake- Significance on health.

UnitIII–Restingpatternandphysicalactivity **9hrs.**

Postures–Ergonomics,GoodandBadpostures,AdvantageandDisadvantages
Degenerative Disc Disease – Causes, types, Consequences to human health
SleepingPattern–Types,advantagesanddisadvantages,circardiumrhythm,nocturnalhabits,consequences to human health,
Physicalactivity,obesityandweightmanagement-Typesandsignificance,weightmanagement,

UnitIV–Personalhabitsandhygiene **9hrs.**

PersonalHabits:

Alcoholaddiction,Smoking,SubstanceAbuse,Electronicaddiction-Factors,symptoms,typeshealthimpact, measures to overcome

Personalhygiene:

Generalhygiene,menstrualhygiene,dentalhygiene

UnitV–SupportingMentalHealth **9hrs.**

Stress-Causes,types,signsandsymptoms,copingwithemotionsandstress,impactofStressonadolescent health
DepressionandSuicidaltendency-CausesandimpactofDepressiononadolescenthealth
Peer pressure- Causes, types and impact of peer pressure and ways to overcome on adolescent health
Procrastination-Causes,typesandimpactofpeerpressureandwaystoovercomeonadolescenthealth
Violence – Types, causes and effects, rehabilitation measures

TextBooks:

1. AnIntroductiontoLifestyleManagement:Facilitator'sHandbook,Dr.AnjaMorris-Paxton,2019
2. FoodScience-Srilakshmi,ProsperMontaguePublishingGroupLtd.,Hamlyn,London.2015.
3. Internet Addiction: The Ultimate Guide for How to Overcome An Internet Addiction For Life (Gaming Addiction, Video Game, TV, RPG, Role-Playing, Treatment, Computer) Paperback Caesar Lincoln, 2014.
4. Food & Nutrition- Swaminathan (1995), The Bangalore Printing & publishing co ltd., Vol I, Second Edition, Bangalore
5. TheNewRulesofPosture:HowtoSit,Stand,andMoveintheModernWorld,MaryBond,2006
6. Stress Management: A Wellness Approach First Edition by Nanette E. Tummers,ISBN-13: 978-1450431668

EvaluationPattern:

Assessment	**Internal**	**External**
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

NUTRITIONFORATHLETES

Semester : III & VII	**HoursofInstruction/week–3**
CourseCode:25FSN333	**No.of Credits–3**
L-T-P – 3-0-0-3	**Total45 hrs.**

Pre-requisite: Healthandfitnessknowledge,practice.

CourseObjectives:

1. Understandthedietaryrecommendationsforathletes
2. Acquireknowledgeondietarysupplements&ergogenicaidsforathletes
3. Gainscientificknowledgeonmedicalnutritiontherapyfornutritionaldisordersamongathletes

CourseOutcomes:
CO1:UnderstandtheNutritionalRequirementforAthletes
CO2:GainknowledgeontheNutritionforSpecialgroupsandSportsinjuries
CO3:Acquireknowledgeonsignificancedietarysupplements&ergogenicaidsforathletes CO4:
Gain scientific knowledge athletes with nutrition related disorders

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2	PSO3	PSO 4
CO1	1	-	-	-	-	-	-	1	1	-	1
CO2	1	-	-	-	-	-	-	1	-	-	-
CO3	1	2	-	-	-	-	-	1	1	-	2
CO4	1	-	-	-	-	-	-	1	2	-	1

Syllabus:

UnitI-AthletesandtheirNutritionalRequirement **11 Hrs**
Athletics-Definition,classification.Nationalandinternationalorganizations.Athleticsvsnutrition.
Childrenandadolescentathletes-Growthanddevelopment,Nutritionalissuescommonlyfaced;Eatinghabitsandaddiction; Nutritional requirements for growth and training.

Femaleathletes-Vulnerabilitytonutritionassaultandinsufficiency;Differencesinfuelornutrientutilisationamongfemale athletes;Femaleathletictriad(FAT)includingeatingdisorder,menstrualirregularityandpoorbonemineraldensity;Dietary guidelines and suggestions for FAT.

MaleAthletes-Dietaryrecommendationsformaleathletes.

Vegetarian athletes- Classification; Nutritional status and dietary considerations; Nutritional gaps currently identified and suitable dietary modification for fueling during training, competitions and traveling.

UnitII-NutritionforSpecialgroupsandSportsinjuries **11Hrs**

TheParalympic Athlete-Athletes withphysical orintellectual impairments.Eatingdifficulties and behavioursobservedin some athletes with impairments. Paralympic athletes and nutritional demands- Dietary intakes and potential issues.Sport injuryandrehabilitation-Typeofinjuryandrehabilitationrequired,Physiologicalandmetabolic changesduringinjuryand rehabilitation.Eatinghabitscommonlyfollowedduringaninjury.Overweight amonginjuredathletes.Roleofnutritionand dietary guidelines in recovery from an injury.

UnitIII-Dietarysupplements&ErgogenicAidsforAthletes **11Hrs**

Dietarysupplementforathletes.Significanceofnutritionalsupplementscomplementingnutrient-densediets.Macronutrient Supplements. Protein supplements- Whey, casein, egg albumen, soy protein, pea protein & other vegan proteins, protein bars,proteinshakes,aminoacidsupplements.CarbohydrateSupplements-Carboloading,SportsDrinks,BarsandGels.Fat supplements- Omega fatty acids and fish oils. Vitamin, minerals and antioxidants supplements.

ErgogenicaidsforAthletes-DefinitionandClassifications.MetaboliteandBotanicalErgogenicSupplements-Wheatgerm oil, beetroot, green tea extract, phytosterols, bio flavonoids, herbal testosterone-booster, beta-alanine.

UnitIV-AthleteswithNutritionrelateddisorders **12Hrs**

Nutritional disorders among athletes- Diabetes, Cardiovascular disease- Problems of athletes with type 1 diabetes and cardiovascular diseases. Physical activity prescription for athletes with type 1 diabetes and cardiovascular disease. Acute effects of exercise in athletes with Type 1 diabetes and cardiovascular disease; Medical nutrition therapy for athletes with type-1 diabetes and cardiovascular disease. Athletes with gastrointestinal disorders, osteoporosis, anaemia, food related adverse reactions (FRAR). Medical nutrition therapy during nutritional disorders.

TextBooks:

1. McardleW.D.(2018).SportsandExerciseNutrition,5th Edition,LippincottWilliamsandWilkins,North America.
2. BurkeL.(Author),DeakinV.(2015).ClinicalSportsNutrition.McGrawHill,Australia.

ReferenceBooks:

1. McGinnisP.M.(2020).BiomechanicsofSportandExercise.4th EditionHumanKinetics,USA.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

ELECTIVES B (SEMESTER IV & VI)

HOMESCALEPRESERVATIONOFFOODS

Semester: IV & VI	**HoursofInstruction/week–3**
CourseCode:25FSN341	**No.of Credits–3**
L-T-P – 3-0-0-3	**Total45 hrs.**

Pre-requisite:Foodprocessing,preservation,additives,preservatives

CourseObjectives:

1. Togiveanunderstandingonthemethodsofhomescalefoodpreservation
2. Torelatetopreservationonsugar,salt,dryingandchemicalspreservative
3. Learnttheimportanceofmoistureremovalandfermentationinhomescalepreservation

CourseOutcomes:

CO1:Gainexpertiseonthepreservationmethodsoffoods.
CO2: Enhance the knowledge related to sugar preservation methods
CO3:Understandthepreservationmethodusingdifferentdryingmethods
CO4: Gain knowledge on the chemical and salt preservation methods
CO5:Empoweronthedifferentfermentationmethodsandfermentedproducts

Skills: Developskillsinfoodprocessingandpreservationathomescalelevel

CO-POMapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	1	-	-	-	1	1	1	1	-
CO2	1	-	1	-	-	-	1	1	1	1	-
CO3	1	-	1	-	-	-	1	1	1	1	-
CO4	1	-	1	-	-	-	1	1	1	1	-
CO5	1	-	1	-	-	-	1	1	1	1	-

Syllabus:

Unit1-IntroductiontoFood Preservation **9hrs.**

BasicPrinciplesofFoodPreservation,TypesofSpoilage,ImportanceofFoodPreservationDifferentMethods of Food Preservation. Management of surplus foods.

UnitI1-PreservationbyusingSugar **9hrs.**

Sugarconcentrates,PreparationofJam,Jelly,Marmalades,Preserves,Candied,Glazed,CrystallizedFruits, FPO Specification, Problems Encountered, Spoilages

UnitIII-PreservationbyRemovalof Moisture **9hrs.**

SundryingDrying,Dehydration,MethodofDrying,PreparationofVegetableVathals-LadiesFinger,Brinjal, Beans,ClusterBeans,PreparationofVadams–Ricevadam,SagoVadam,RiceFlakesVadam,TomotoVadam

Unit IV-Preservation by using Chemicals and Salts **9hrs.**

ChemicalPreservatives –Definition,TypesofPreservatives,PreparationandPreservationofFruitJuices, picking – Principles Involved, Process, Types PreparationofVariousTypesofPickles–Lime,Mango,Ginger,Capsicum,MixedVegetables,Brinjal,Onion, Garlic

UnitV-Fermentation **9hrs.**

Definition,TypesofFermentation,CommonFermentedFoods–CheeseMaking,Dokhla,Wine

Textbooks:

1. Srilakshmi,B.(2023)FoodScience,9th edition,NewAgeInternational(P)Ltd.,NewDelhi,
2. Adams,M.R.andMoss,M.O.(2005)FoodMicrobiology,NewAgeInternational(P)Ltd.,NewDelhi,.
3. UshaChandrasekhar,(2002)FoodScienceandApplicationsinIndianCookery,PhoenixPublishingHouse Pvt. Ltd., New Delhi,.

ReferenceBooks:

1. Fellows,P.(2000)FoodProcessingTechnology,PrinciplesandPractice,2nd Edition,CRCPress, Woodland Publishing Ltd., Cambridge, England.
2. Sommers,C.H.andXvetengFan,(2006)FoodIrradiationResearchandTechnology,Blackwell Publishing, 2006.
3. Swaminathan,M.FoodScience,ChemistryandExperimentalFoods,BappcoPublishers,2013.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

BASICSOFFOODENGINEERING

Semester:IV&VI	**HoursofInstruction/week–3**
Code: 25FSN342	**No.ofCredits–3**
L-T-P – 3-0-0-3	**Total45hrs.**

CourseObjectives:

1. Understandthebasicprinciplesoffoodengineering
2. ComprehendthetypesandpropertiesofRefrigerationsystems
3. Gainknowledgeonprocessingequipmentandmaintenanceofprocessingequipment

CourseOutcomes:

CO1:Understand the significance of food engineering and its principles
CO2:Acquireknowledgeonsteamgeneration,utilizationandevaporation CO3:
Gain knowledge on refrigeration and freezing in food industry
CO4:Designplantlocationandequipmentlayoutforestablishingafoodindustry

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2	PSO3	PSO 4
CO1	-	-	1	-	-	-	-	-	-	1	-
CO2	-	-	1	-	-	-	-	-	-	1	-
CO3	-	-	1	-	-	-	-	-	-	3	-
CO4	-	-	1	-	-	-	-	-	-	3	-

Syllabus

UnitI-FoodEngineering-AnOverview **11 Hrs**

FoodEngineering-Historicalbackground.FoodEngineeringasadistinctdiscipline.Basicfoodengineeringprinciples- physical, thermal, aerodynamic, mechanical, optical and electromagnetic properties.

UnitII-SteamGeneration,UtilizationandEvaporation **11 Hrs**

Properties of steam. Steam tables and their application. Boilers operation. Maintenance of boilers. Utilizationof steamin food processing. Pressure vessels. Evaporators-Types, principles and equipment. Vapour compression evaporation systems.

UnitIII-RefrigerationandFreezinginFoodIndustry **11 Hrs**

Refrigerator- parts and functions. Classification of refrigerants. Refrigeration Cycle. Refrigerator Load. Condenser, Evaporatorandcompressor.Applicationofrefrigerationinfoodprocessing.CryogenicFreezingandIndividualQuick Freezing (IQF).

UnitIV-PlantDesigns,LocationandEquipmentLayout **12Hrs**

Plant designs- design and construction of building, functionality of the building, design and fabrication equipment. Plant location. Cost benefit analysis. Food process economics. Plant layout. Factors to be considered for location and layout of food plants. Regulatory requirements of food industries.

TextBooks:

1. C.andS.PadmaIshwaryaS.P.(2019).EssentialsandApplicationsofFoodEngineering.CRCPress,USA.
2. RaoD.G.(2018).FundamentalsofFoodEngineering.PrenticeHallIndiaPrivateLimited,NewDelhi.

ReferenceBooks:

1. ToledoR.T.2020.FundamentalsofFoodProcessEngineering3rdEdition.CRCPress,USA.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Seminar,ProjectsandReports.

CAREEROPPORTUNITIESINFOODSCIENCEANDNUTRITION

Semester: IV & VI	**Hoursof Instruction/week–3**
CourseCode:25FSN343	**No.ofCredits–3**
L-T-P – 3-0-0-3	**Total 45 hrs.**

Prerequisite: Biologicalsciences,foodscience,dietetics,communitynutrition,foodindustry

CourseObjectives:

1. ToextendhigherlearningopportunitiesforUGFoodScienceandNutritiongraduates.
2. TomakebetterunderstandingonvariouscareeropportunitiespertainingtograduatesinUGFoodScience and Nutrition.
3. TobuildcapacityandLearningskillforcompetitiveexaminationopeningintogovernmentandnon- government sectors

CourseOutcome:

CO1:Awarenessbuiltonthepreparationforhigherlearningopportunities

CO2:Buildingappropriateskillsandcapacitytoopencareersinvarioushospitalsector.

CO3:Gainknowledgeonthesuitableskillsforcareeropportunitiesingovernmentsectorandcommunity CO4: Develop skills for career opportunities in food and entrepreneur sector

CO5:Buildingknowledgeandskillsforthecompetitiveexampreparations.

Skills: Strengthentechnicalanddevelopexampreparednessskills

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	1	-	3	3	-	-	2	-
CO2	-	-	-	1	-	3	3	-	-	2	-
CO3	-	-	-	1	-	3	3	-	-	2	-
CO4	-	-	-	1	-	3	3	-	-	2	-
CO5	-	-	-	1	-	3	3	-	-	2	-

Unit I - Preparation for higher learning & research **9hrs.**

Understandingthedomainsofhigherlearning,Opportunitiesforhigherlearning,thrustareasofexchange studies, possible interdisciplinary courses and learning opportunities.

UnitII-Careeropportunitiesinhospitals **9hrs.**

RegisteredDietitianExamination,preparation,howtoapply,syllabus,technicalknowledgeandskills required.

Unit III - Career opportunities in government sector & community **9hrs.**

VariousMinistry,Nationalandstategovernmentdepartmentsopenforrecruitingofficersandstaffwithfood science and nutrition background.

Unit IV - Career opportunities in food industry & as entrepreneur **9 hrs.**

RequiredEducation&TrainingforacareerintheFoodIndustry,*OpportunitiesasaFood*technologist Product/processdevelopment*scientist*,Qualitymanager,Regulatoryaffairsofficer,KnowabouttheRecruiters and roles and responsibilities. Small- and large-scale food-based business, how to initiate startups, applying for FSSAI, setting quality standards roles and responsibilities.

Unit V – Preparation for competitive exams **9hrs.**

Variousresourcesweblinksandwebsitesforvariousrelevantjobapplications.StateemploymentExchange registration.

RegisteredDietitianExam-Eligibility,registration,application,Syllabus.

NET/SLETExams–Interiordesign,resourcemanagement,textilesandclothing,humandevelopment, extension education

Textbooks/References:

1. Premalata,M,(2007),'TextBookofHomescience',KalyaniPublishers,Chennai.
2. Onlineresources

EvaluationPattern

Assessment	**Internal**	**External**
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

ELECTIVE C (SESMESTER VIII)

BAKERYANDCONFECTIONERY

Semester:VIII	**HoursofInstruction/week–3**
CourseCode:25FSN351	**No.ofCredits–3 Total**
L-T-P – 2-0-1-3	**45 hrs.**

Pre-requisite: Bakingprinciples&bakeryproducts

CourseObjectives:

1. Tocreateknowledgeontheroleofscienceandtechnologyinbaking
2. Tointegratetheroleofdifferentingredientsinbakery
3. Tofamiliarizewithskillsinplanningandestablishingabakeryunit.

CourseOutcomes:

CO1:Improvedknowledgeonprinciplesofbakingandappropriatesanitation,hygieneandsafetypracticesduringbaking CO2: Understanding the role of ingredients in baking quality.
CO3:Gainknowledgetosetupabakeryunit.
CO4:Increasedknowledgeonthecompleteprocessofbakingandpresentationofbakedproducts CO5: Gain knowledge on the processing and preparation of confectionary products

Skills: Learnedvariousbakingskillstobakedifferentproducts

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	-	-	-	1	1	-	1	-
CO2	1	2	-	-	-	-	1	1	-	1	-
CO3	1	-	-	-	-	-	1	1	-	2	-
CO4	1	1	1	-	-	-	1	1	-	2	-
CO5	1	1	1	-	-	-	1	1	-	2	-

Syllabus:

UnitI- Introductiontobaking **8hrs.**

Baking - Definition, History, Principles of baking, classification of baked foods. Types of equipment's in baking industry, cleaning and sanitizing methods of baking equipment's, baking temperature of different products, operation techniques of different baking equipment's.

UnitII-RoleofIngredients **8hrs.**

Ingredients and Their Role in Baking - Four, Yeast, sugar, egg, butter, salt, baking powder, colouring, flavouring agents. List of standard colouring and flavouring agents

UnitIII-Factorsforsettingupabakeryunit **10hrs.**

FactorstobeconsideredforSettingupaBakeryUnit
TypesofOvens–ConstructionandWorkingofConventionalandModernOvens,StudyandMaintenanceofMajor and Minor Equipment's.
BreadMaking–StepsandMethods,RoleofIngredients,VarietyBreads,QualitiesofaGoodLoaf,BreadFaults, bread diseases.

UnitIV-PreparationandDecorationofbakedfoods **10hrs.**

CakeMaking–FunctionsofIngredients
CakeMixingMethods,TypesofCakes,CakeJudging,CakeFaultsandremediesBiscuit,CookieandPastry Making, Types and techniques of Icing,
Frostingandfillings.Sensoryevaluationofbakedproducts-objectiveandsubjectivemethods

Unit V-Confectionery **9hrs.**

Processing ofRawMaterials-CocoaandChocolate. Making ofToffee,Chocolates,FruitDrops,HardBoiled Candies(clear,hard,pulled,grained,filled),Softcandies(fondant,modifiedfondantsliketoffee,fudge, marshmallows, gums, jellies, chocolates) Bars, ChewingGums, Special ConfectioneryFoods-tablets, Lozenges. **Practicals*:***

1. Introductionoftoolsandequipment'sofbakeryproducts.
2. Preparationofrichyeastfermentedbreads
3. Preparationofbiscuitsandcookies.
4. Preparationofpizza.
5. Preparationofvarioustypesofcakes.
6. Preparationoffillingandicings.
7. VisittoaProfessionalBakery

ReferenceBooks:

1. The Baker'sBook:A PracticalHand Book oftheBakingIndustry inAllCountries,2022,EmilBraun, Legare Street Press.
2. Potter,N.FoodScience,TheAVIPublishingCo.,Inc.,WestPort,5th edition,Connecticut,2007.
3. Baker'sHandbookonpracticalBaking.WheatAssociates,USA,NewDelhi.
4. Dubey,SC,BasicBakingScienceandCraft,JwalmukhiJobPress,Bangalore,1979.
5. ModernPastryChab,Vol.IandII,AVIPublishingCo.,Inc.,WestPort,Connecticut,1977.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

HOSPITALITYMANAGEMENT

Semester:VIIICourse	**HoursofInstruction/week–3**
Code:25FSN352	**No.ofCredits–3**
L-T-P–C 30 0 3	**Total45 hrs.**

Prerequisite:culinaryart,frontoffice,eventmanagement

CourseObjectives:

1. Introductiontothebasicofthehospitalityandcateringindustry.
2. Toeducateontheproceduresandpracticesadoptedinhospitalitymanagementofhotel services.

CourseOutcome:

CO1:Understandthebasicconceptsofculinaryscienceandfoodproduction.
CO2:Gainbasicknowledgeontheequipment,menuandskillsnecessaryforfoodandbeverageservice. CO3: Acquire knowledge on principles and functions of room service and front office.
CO4:Comprehendtheroleofhousekeepingandsanitationinhospitalityandcateringmanagement. CO5: Gain knowledge on event planning and management in various occasions.

Skills:

- Enhanceknowledgeandskillsofdifferenttypesoffoodandbeverageservices.
- Applyingtechnicalskills,knowledgeofaccommodation,frontofficeandhousekeepingoperationsinhotel industry.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	1	-	2	-	-	3	1
CO2	-	-	-	-	1	-	2	-	-	3	1
CO3	-	-	-	-	1	-	2	-	-	3	1
CO4	-	-	-	-	1	-	2	-	-	3	1
CO5	-	-	-	-	1	-	2	-	-	3	1

Syllabus: **45hrs.**

UnitI-FoodProduction **9hrs**

History – Culinary Science, Indian Cuisine and culture, Oriental and global cuisine, Basics of Food Science, Food Production,Portioncontrol,typesof menuplanning,layoutandorganisationofkitchen,preservationoffood,Foodquality and storage, hygiene and sanitation, Pest control, FSSAI, HACCP system, ethics in hospitality management, cost control departments and its function.

UnitII-FoodandBeverage Service **9hrs**

Introduction to catering industry, responsibilities of F& B department , food& beverage outlets, ancilliary departments, equipments usedin F& B,classificationof alcoholicbeverages, Menu inF & B -Courses of French Classical –Sequence, Knowledge of accompaniments of continental dishes, types of food service, control system, non-alcoholic beverages.

UnitIII-AccommodationandFrontOfficeOperation **9hrs**

Origin & growth of hospitality industry, classification of hotel, hotel organization, front office function areas, inter departmentalcommunication.Interiordesigndefinition,theoryofstandarddimensionbasedonhumanfiguresforactivities, principlesofinteriordesign,historyofinteriordesign,types-nonEuropeantraditions,Indiantraditional designs,designing of furniture & flooring, Flower arrangement.

UnitIV-HousekeepingOperation **9hrs**

Role and responsibility of housekeeping department, inter departmental coordination of housekeeping, classification of cleaningagentsandequipments,housekeepingdepartments,controldesk,hygienepersonalhygiene,hygieneandsanitation of guest rooms and public areas, eco-friendly cleaning agents - security in guest rooms.

UnitV-EventManagement **9hrs**

Introduction to meeting and event management, Event planning, Event planning, Designing, Program scripting – public relation – electing a location - social and business etiquette – speaking skills – stage decoration – team spirit – time management, Concept of exhibition - space planning – ITPO- sporting events – tourism events – leisure events, food festivals– expo, carnival, mela.

Activity

1. VisittoaHotel/Guest House

Textbooks:

1. HotelHousekeepingoperationsandManagement,4thedition,2023,OxforduniversityPressG.Raghubalan, Smritee Raghubalan
2. FoodProductionOperations,3rdedition,ParvinderS.Bali,2021,NewDelhi:OxfordUiversityPress,2022.
3. CateringManagement:AnIntegratedApproach.ByM.Sethi.Aboutthisbook·NewAgeInternational,2022

ReferenceBooks:

1. Dennis.R.LillicrapandJohn.A.Cousins.FoodandBeverageService:GreatBritain.ElBsPublishers.6th Edition.2002.
2. JohnFuller.ModernRestaurantService,AManualforStudentsandPractitioners:Cheltenham.StanleyThrones Publishers.1st Edition.1999.
3. SudhirAndrews.FoodandBeverageServiceTrainingManual:NewDelhi.TataMcgrawHillPublishers.36th reprint. 2005
4. SueBaker,PamBradlyandJeremyHuytonPrinciplesofHotelFrontOfficeOperations: London.Cassell Publishers. 2 nd Edition 2004.
5. S.K.Bhatnagar.FrontOfficeManagement:NewDelhi.FrankBros,andCoPublishersLtd.,1stEdition.2002

EvaluationPattern

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODSAFETYANDQUALITYCONTROL

Semester:VIII	**HoursofInstruction/week–3**
CourseCode:25FSN353	**No.ofCredits–3**
L-T-P – 2-1-0-3	**Total45 hrs.**

Pre–requisite: Foodsafety,Consumerawareness,Nutritioninformationandlabelling

CourseObjectives:

1. Toimpartthebetterunderstandingontheroleofsanitizationandhygienetoproducequalityfood.
2. Togetfamiliarizewithstandardsforqualityassessmentandfoodsafetyandcriticalassessmentandcontrol points for quality assurance.

CourseOutcome:

CO1:Basicunderstandingofsanitization,hygiene,safetyandquality.
CO2:Acquireknowledgeinfoodqualityanalysismaterialsandfoodadditives.
CO3:Graspingtheprinciplesoffoodqualitycontrol,lawsandfoodadulterationusedinindustry.
CO4:Gainknowledgeonmethodsfordeterminingqualityoffoodsusingsubjectiveandobjectivemethods. CO5: Expertise food safety management, hazards analysis and control measurements.

Skills: Developskillsinfoodsafetyandfoodqualitymanagement

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	2	-	1	-	-	-	-	-	2	2
CO2	-	2	-	1	-	-	-	-	-	3	-
CO3	-	2	-	1	-	-	-	-	-	2	-
CO4	-	2	-	1	-	-	-	-	-	3	-
CO5	-	2	-	1	-	-	-	-	-	3	-

Syllabus:

UnitI-BasicsofFoodSafety **8hrs.**

Water,Sanitation,Hygiene,Foodquality,Foodselection,FoodSafety,Householdhygiene,Foodsafetymeasures duringfood production, Organization of qualitycontrol function in the food industry.

UnitII-PrinciplesofQualityControlofFood **10hrs.**

Rawmaterialcontrol,processedcontrolandfinishedproductinspection.Leaveningagents,classification,usesand optimum levels.

Foodadditives-Preservatives,colouring,flavouring,sequesteringagents,emulsifiersandantioxidants.

Unit III- Standardization systems for quality control of foods

8hrs. National andInternationalstandardizationsystem,Foodgrades,Foodlaws-compulsoryandvoluntarystandards. Food adulteration - Common adulterants in foods and tests to detect common adulterants.

UnitIV-Methodsfordeterminingquality **10hrs.**

Subjectiveandobjectivemethods.

Sensory assessmentof food quality-appearance, color, flavour, texture and taste, differentmethods of sensoryanalysis, preparation of score card, panel criteria, sensory evaluation room.

UnitV-Food safety **9hrs.**

Theconcept offoodsafetyanditsdefinition.Elementsoffoodsafetymanagement.Challenges inmanagement of food safety and outlook. Hazards associated with foods – Milk and dairy products; meat, egg and poultry; fruits and vegetables; nuts and oil seeds. Control of hazards and management of safety of foods at raw and processed stage. HazardAnalysisandCriticalControlPointSystem(HACCP):Introduction,theneedforHACCP,Principlesofthe HACCP System and application of HACCP, microbiological criteria in food packaging.

PRACTICALS

Assessmentofqualityparametersandadulterantsindifferentfoods

1. Surveyoflabelinformationoffoodsinmarket
2. Cereals,PulsesandFlours–Labelinformation,detectionofadulterants
3. Fatsandoils–Labelinformation,Adulteranttests,IodinenumberandFFAValue
4. Fruitandvegetableproducts–Labelinformation,Acidity,TSS,Sugars
5. CoffeeandTea,Honey–Labelinformation,DetectionofAdulterants
6. Milkandmilkproducts-Labelinformation,COBtest,Acidity,MBRT,Detectionofadulterants.
7. SpicesandCondiments-Labelinformation,Detectionofadulterants.

ReferenceBooks:

1. GuidetoImproveFoodHygiene -GastonandTiffney,3rdEdition,2021
2. PracticalFoodMicrobiology&Technology-HarryH.Weiser,Mountney,J.andGord,W.W.,2021
3. PrinciplesofFoodSanitation-MarriottandNorman,G.6thedition2018
4. JayM.J(2015)ModernFoodMicrobiology,FourthEdition,CBSPublishersandDistributors,NewDelhi
5. Mahirdra-S.N.-Foodsafety–Atechno-legalanalysis-TataMcGrawhillpublishers2018.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

COREELECTIVE(SEMESTERVI) FOOD

FORTIFICATION

SemesterVI	**HoursofInstruction/week–3**
CourseCode:25FSN361	**No.of Credits–3**
L-T-P –3 0 0-3	**Total 45 hrs**

Courseobjectives:

1. Understandtheprinciples,importanceandmethodsoffoodfortification.
2. Learnvariousaspectsoffortifiedfoodproducts.

Courseoutcomes:

CO1:Acquireknowledgeondifferenttechniquesusedforfortifyingfoods. CO2:

Empowering the knowledge on nutrients used as fortificants.

CO3:Gainpreciseknowledgeonvariousfortificantsandvehicles

CO4:Generatecost-effectiveandsafefortifiedfoodsfortargetpopulations.

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	1	-	1	2	1	1	2
CO2	2	1	-	-	1	-	1	2	1	1	2
CO3	2	1	-	-	1	-	1	2	1	1	2
CO4	2	1	-	-	1	-	1	2	1	1	2

Syllabus

UnitI:FoodFortification **15hrs**

Food fortification: Definition, types, Legal considerations, Mandatory vs. Voluntary fortification, importance and health benefits;FoodvehiclesandFortificants:Selectionoffoodvehicles,criteriaforselectionoffoodfortificants,Bioavailability, Stability and interaction of fortificants in the foods.

UnitII:NutrientsasFortificants **10hrs**

Vitamins (A, B, C and D) and minerals (iron, iodine, zinc and calcium) – Sources, Physical characteristics and choice of fortificantmethodstoincreaseabsorptionoffortificants/preventionofloss,Fortificationpremixes-designandcomposition of premixes.

UNITIII:FoodsasVehiclesforFortification **10hrs**

i)Rice, Cerealflours,cereal products(bread,pasta,noodles,biscuitsandii)Salt andsugar,iii)edible oils,iv) Beverages; v) Candies,Nutri-bars,andGranolabars,vi)Snackfood,waterandotherfoods.Technologyoffortification,challenges (safety, technological and cost limits), packaging and shelf life quality of fortified foods.

UnitIV:GuidelinesforFortification **10hrs**

Meritsanddemeritsoffortification,choiceofproductsandselectionofmicronutrients,Settinglevelоffortification,Safety limits, Technological and cost limits, Challenges in fortifying snack products, Nutrient interaction and bioavailability.

References

1. HandbookofFoodFortificationandHealth:FromConceptstoPublicHealthApplicationsVolume2(Nutritionand Health), 2016.
2. PreedyVR,SrirajavenkanthanRandPatelVB.HandbookofFoodFortificationandHealth,Vol.1& 2,Springer Publications. 2013.
3. StakeholderconsultationonRegulationforstaplefoodFortification:15April2011:NationalInstituteofNutrition and Indian Council of Medical Research, Hyderabad, working paper
4. FoodFortificationandSupplementation:Technological,SafetyandRegulatoryAspects(WoodheadPublishing Series in Food Science, Technology and Nutrition) Hardcover – Import, 31 March 2008.
5. GuidelinesonFoodFortificationwithMicronutrients.AllenL,BenoistBD,DaryOandHurrellRWHOandFood and Agricultural Organization, USA. 2006.
6. LindsayAllen,BrunodeBenoist,OmarDaryandRichardHurrell(Eds.)2006Guidelinesonfoodfortificationwith micronutrients: World Health Organization and Food and Agriculture Organization of the United Nations

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Seminar,ProjectsandReports

Semester:VI	**HoursofInstruction /Week-3**
CourseCode:25FSN362L-T-P– 3 0 0 3	**No. of Credits - 3**
L– T-P-30 0 3	**Total 45 hrs**

FOODINDUSTRYMANAGEMENT

CourseObjectives:

1. Understandthebasicconceptsoffoodindustryandfutureprioritiesinfoodproduction
2. Comprehendtheguidelinesforgoodmaintenance&safetyprecautionsinfoodindustry
3. Gainknowledgeonimprovingsustainabilityinfoodsector

CourseOutcomes:

CO1:Understandthecomponents,organizationoffoodindustryandfuturechallengesinfoodproductionsector CO2: Acquire knowledge on food industry maintenance
CO3:Gainknowledgeonfoodsafetyandassurancesysteminfoodindustry CO4: Analyse different aspectsofsustainabilityand ethicsinfoodindustry

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	-	-	-	-	3	-
CO2	-	-	-	-	-	-	-	-	-	3	-
CO3	-	-	-	-	-	-	-	-	-	3	-
CO4	-	-	-	2	-	-	-	-	-	3	-

Syllabus

UnitI-FoodIndustry-An Overview **14 Hrs**

Food Industry- Trends in food industry- Global and Indian perspective. Components of Food Industry. Organization in food industry. Operations of food industry. Deteriorative factors and hazards during processing, storage, handling and distribution.Foodregulatorybodiesandmechanisms,certificationprocesstosetupmicro,macromodelfoodindustries. Future priorities in food production and challenges.

UnitII-FoodIndustryMaintenance **14 Hrs**

FoodIndustry-Maintenanceofstaffandplantoperators;Preventivemaintenance;Guidelinesforgoodmaintenance&safety precautions; Work place improvement through '5S'. Wastewater and solid waste treatment. Financial management & financing for food industries. Marketing and E-Trading. Handling customers' complains, evaluation and solution of problems, Report making. Corrective action preventive action (CAPA) in food industry.

Unit III- Food Safety and Assurance System in Food Industry **16 Hrs**

Principlesandsystemsforqualityandfoodsafetymanagement.Hygienicdesignsandmaintenanceofequipmentsinfood industry.HACCPanditsmisconceptioninfoodindustry.Managementofhazards.Assessmentoffoodsafetymanagement systems. Incidentmanagement androotcauseanalysis.Crisismanagement infoodindustry.Significanceofinternational, regional and national organisation in food production sector.

UnitIV–SustainabilityandEthicsinFoodIndustry **16 Hrs**

Sustainablility and food production in future. Food safety and sustainability. Social, economic and environmental aspects ofsustainabilityandfoodproduction. FoodIndustrywastemanagement. Improvingsustainabilityinfoodsector.Impactof climatic change in food safety. Nutritional trends and health claims. Preparation of business proposals. Starting a Food Industry.Casestudiesonprojectformulationinvarioustypesoffoodindustries.Ethicsinfoodsafetymanagement-Ethical issues in food production and food safety. Ethical decision-making.

TextBooks:

1. SwainsonM.(2018).Swainson'sHandbookofTechnicalandQualityManagementfortheFoodManufacturing Sector, Woodhead Publishing, UK.
2. JordanL.(2015).FoodIndustry:FoodProcessingandManagement.CallistoPublishers, USA.

ReferenceBooks:

1. LelieveldH.andMotarjemiY.(2013).FoodSafetyManagement:APracticalGuidefortheFoodIndustry. Elsevier Science. Academic Press, USA.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Seminar,ProjectsandReports

GENERIC ELECTIVE

ELECTIVE–A(SEMESTERIII,VI,VIII)

FOOD TOXICOLOGY

Semester: III, VI, VII	**Hoursof Instruction/week–3**
CourseCode:25FSN371	**No.of Credits–3**
L-T-P–C 3-0-0-3	**Total45 hrs.**

Prerequisite: BasicFoodGroups,FoodAdditives,FoodMicrobiology

CourseObjectives:

1. Toobtainbasicknowledgeontheprinciplesoffoodtoxicologyand theimpactofnaturaltoxinsinfoods.
2. Toanalyzeandstudytheinfluencingfactorslikeenvironment,toxins,drugs,andadditivesonfoodallergensand sensitivity.

CourseOutcomes:

CO1: Acquire knowledge of the principles of food toxicology.
CO2:Gainknowledgeontheimpactsofnaturaltoxinsinfoods.
CO3:Understandtherelationshipbetweenfoodallergensandsensitivity
CO4:GainknowledgeonEnvironmentalcontaminantsanddrugresiduesinfood
CO5:Developfoodprocessingskillsandunderstandtheroleoffoodadditivesandtoxicants.

Skills:

- Developskillsontheidentificationoffoodallergens
- Acquireskillsinunderstandingtoxins,harmfuladditives

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	-	-	-	-	-	-	-	-	-
CO2	1	-	-	-	-	-	-	-	-	-	-
CO3	1	-	-	-	-	-	-	-	-	-	-
CO4	1	-	-	-	-	-	-	-	-	-	-
CO5	1	-	-	-	-	-	-	-	-	1	-

Syllabus:

UnitI-Principlesof Toxicology **9Hrs**

Classification of toxic agents. Characteristics of exposure. The spectrum of undesirable effects. Interaction and tolerance. Biotransformation and mechanisms of toxicity. Evaluation of toxicity- risk vs. benefit. Experimental design and evaluation- Prospective and retrospective studies. Controls: Statistics (descriptive and inferential). Animal models as predictors of human toxicity. Legal requirements and specific screening methods as per OECD guidelines in vitro and in vivo studies. Clinical trials.

UnitII-NaturalToxinsinFood **9Hrs**

Naturaltoxinsofimportanceinfood-toxinsofplantandanimalorigin.Microbialtoxins(e.g.,bacterialtoxins, fungal toxins and Algal toxins)- Natural occurrence, toxicity and significance. Determination of toxicants in foods and their management.

UnitIII-FoodAllergiesandSensitivities **9Hrs**

Natural sources and chemistry of food allergens, True/untrue food allergies. Handling of food allergies. Food sensitivities (anaphylactoid reactions, metabolic food disorders, and idiosyncratic reactions). Safety of genetically modifiedfood-potential toxicityandallergenicityof GMfoods. Safetyof children's consumables.

UnitIV-EnvironmentalContaminantsandDrugResiduesinFood **9Hrs**

Fungicideandpesticideresiduesinfoods;heavymetalandtheirhealthimpacts.Useofveterinarydrugs(e.g.Malachite greeninfishandβagonistsinpork).Radioactivecontaminationoffood,Foodadulterationandpotentialtoxicityoffood adulterants. Endocrine disrupters in food.Microplastics in food: Health risks and solutions.

UNIT V- Toxins generated during Food Processing **9Hrs**

Safetyoffoodadditives. Toxicologicalevaluationoffoodadditives.Foodprocessinggeneratedtoxicants- Nitroso-compounds, heterocyclic amines. Dietary Supplements and toxicity related to dose- common dietary supplements. Relevance of the dose. Possible toxic effects.

Textbooks:

1. Klaassen,CurtisK.,WatkinsIII,JohnB.(2021).EssentialsofToxicology,4th Edition,McGraw-HillMedical, USA.
2. Casarett&Doull's.(2019).Toxicology:TheBasicScienceofPoisons,9th Edition.Mcgraw-HillMedical,New York.
3. GalanakisC.M.(2020).FoodToxicologyandForensics.AcademicPress,USA.

ReferenceBooks:

1. FletcherM.andNetzel G.(2020).FoodSafetyandNaturalToxins.MdpiAGpublishers,Switzerland.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

NUTRITIONINEMERGENCIESANDDISASTERMANAGEMENT

Semester: III, VI, VIII	**Hoursof Instruction/week–3**
CourseCode:25FSN372	**No.ofCredits–3**
L-T-P–C 3-0-0-3	**Total45 hrs.**

Prerequisite: Basicfoodgroupsandfunctions;Significanceofmacroandmicronutrients

CourseObjectives:

1. Understandtheemergency,nutritionsurveillance,andtreatmentduringdisastersandpandemic
2. Gainknowledgeonreliefandrehabilitationduringnutritionalemergencies

CourseOutcomes:

CO1Acquireknowledgeinnutritionalproblemsinnaturalandman-madedisastersandemergencies CO2 Assess the nutritional status in emergency and plan surveillance and treatment to the affected CO3 Acquire knowledge on nutritional relief and rehabilitation
CO4Gaininsightonnutritionrecommendationofspecialenvironments
CO5Planandexecuterehabilitationduringnutritionalemergencies-endemic,epidemicsandpandemics

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	-	-	-	-	-	-	2	-	1	-	1
CO2	-	1	-	-	-	-	2	-	1	-	-
CO3	1	2	-	-	-	-	3	-	3	-	2
CO4	-	-	-	-	-	-	2	-	1	-	1
CO5	-	-	-	-	-	-	2	-	1	-	1

Syllabus:

UNITI–DisasterandNutritionalEmgergencies-AnOverview **9Hrs**

- **Natural/Manmade disasters resulting in emergency situations**- Famine, drought, flood, earthquake, cyclone, war, civilandpoliticalemergencies.Factorsgivingrisetoemergencysituationsinthesedisasters.Nutritionalmanagement during disaster.
- **Nutritional problems in emergencies among vulnerable groups-** Causes of malnutrition in emergency situations, Major deficiency diseases in emergencies, Protein Energy Malnutrition, Starvation, Under Nutrition. Dietary and medical treatment during nutritional emergencies.
- **Communicable disease evolving emergency situations-** Surveillance, medical and dietary treatment. Role of immunization and sanitation.

UNITII-NeedBased Assessments **9 Hrs**

- Assessment and surveillance of Nutritional status in emergency affected populations: Scope of assessment of malnutrition in emergencies, Indicators of malnutrition. Clinical signs for screening acute malnutrition, Anthropometric assessment and biochemical examination during nutritional emergencies.
- Disasterandemergenciesspecificassessmenttoolconstruction
- Organizationofnutritionalsurveillanceandindividualscreening.

UNITIII-NutritionalReliefandRehabilitation **9 Hrs**

- Assessmentoffoodneedsinemergencysituations,Fooddistributionstrategy–Identifyingandreachingthevulnerable group – Targeting Food Aid.
- MassandSupplementaryFeeding,TherapeuticFeeding,Specialfoods/rationsfornutritionalrelief,Localproduction of special foods, Local foods in rehabilitation
- Organizationofmassfeeding/generalfooddistribution,Feedingcenters,Transportationandfoodstorage,Sanitation and hygiene, Evaluation of feeding programmes, Household food security and nutrition in emergencies
- Publicnutritionapproachtotacklenutritionalproblemsinemergencies

UnitIV-NutritionRecommendationofSpecialEnvironments **9 Hrs**

- **Nutritional requirement in High altitudes and Low temperatures-** Oxidative stress at High altitudes and Low temperatures.Musclemetabolismduringcoldstressandhighaltitudes.Dietarysupplementsandsuperfoods.Nutrients and cognitive functioning at high altitudes and low temperatures.
- **Human health and performance risk at space exploration and submarines-** Human Metabolism during space explorationandunderwater.Energyutilizationinspaceflights.Proteinandmusclehomeostasis.Fluidandelectrolyte homeostasisduringspaceexploration.Calciumandrelatednutrientsinbonemetabolism.Ironmetabolismandchanges in RBCs metabolism. Antioxidants- Radiation and stress. Nutritional recommendation at space exploration and submarines.

UnitV-NutritionalEmergenciesduringEndemic,EpidemicsandPandemics **9Hrs**

- **Endemic,EpidemicsandPandemics**-GloballyandIndianscenario.Escalationofanepidemictoapandemic.Stages of pandemic. Impact of endemic, epidemics and pandemics on human health.
- **DietandNutritionalEmergencies**-Dietarytreatmentduringendemic,epidemicsandpandemics.Roleofantioxidants and superfoods during these nutritional emergencies.

Practicals/Assignments:

1. Collectionofepidemiologicaldata-ahands-onexperience.
2. SelectionandRapidassessmentofnutritionalstatusinacommunity.
3. Casestudyapproachoncausativefactorsandmanagementofcommunicablediseases.
4. Planningandformulationofnutrient-densefoods.
5. Surveyonadherencetoimmunizationscheduleandvaccines.

ReferenceBooks:

1. WorldDisastersReport(2020).FocusonPublicHealth,InternationalFederationofRedCrossandRedCrescent Societies.
2. Disasters–InternationalPublicNutritionandEmergencies:ThePotentialforimprovingpractice.SpecialIssue– Vol.23/4, Dec. 1999.

3. GuidelinesandResearchpublicationsofOXFAM,WFP,Rome.1999.NutrientRequirementsandRecommended Dietary Allowance for Indians A Report of the Expert Group of ICMR. 2010.
4. Dr.MSwamiNathan.(2010).FoodandNutritionVolume-2SecondEditiontheBangalorePrintingandPublishing Co Ltd Bangalore 560018.
5. ShubhanginiA.Joshi.(2010).NutritionandDieteticsThirdEditionTataMecgrawHillEducationPrivateLimited New Delhi.

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+P2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

PHYSICALCHEMISTRYOFFOODCONSTITUENTS

Semester: III, VI, VIII	**Hoursof Instruction/week–3**
CourseCode:25FSN373	**No.ofCredits–3**
L-T-P – 3-0-0-3	**Total - 45 hrs.**

Prerequisite: BasicsofBonding,thermodynamics,kineticsandsurfacechemistry.

CourseObjective: Toimpartknowledgeonthebasicphysicalchemistryaspectswithrespecttofood

CourseOutcomes:

CO1:Torelatetheapplicationofthermodynamicsinunderstandingthechemistryoffood
CO2:Tounderstandtheconceptofsolutionsofsolidinliquidandliquidinliquidandthepropertiesrelatedtothe concentration of solute.
CO3:Togainknowledgeonthecolloidsandthespecialpropertiesofcolloids CO4: To understand the basics on surface activity and surface reactions
CO5:Toprovideknowledgeontherheologicalproperties,itsmeasurementanditsapplicationtofood

Skills: Developskillsintheapplicationofphysicalpropertiesoffoodsinproductdevelopment

CO-POMapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	-	-	-	-	-	-	-	-	-
CO2	1	-	-	-	-	-	-	1	-	-	-
CO3	1	1	-	-	-	-	-	-	-	-	-
CO4	1	-	-	-	-	-	-	-	-	-	-
CO5	1	1	-	-	-	-	-	-	-	-	-

Syllabus:

UnitI-Thermodynamics 9 hrs

System and surrounding, homogenous and heterogeneous system, Intensive and extensive properties, Entropy, Enthalpy, Gibb's free energy, stable- unstable systems. Heat capacity, specific heat capacity- measurement of specific heat capacity using Bomb calorimeter

UnitII-Solutions 9 hrs

Solubility-relativesolubility,Concentrationofsolutions,Solutionsofsolidinliquid,Factorsinfluencingsolubility, Energy of hydration, Solvation, solutions of liquid in liquid. Colligative properties-Lowering of vapour pressure, elevation of boiling point, depression of freezing point and osmotic pressure.

UnitIII-Colloidalchemistry **9 hrs**

Typesofcolloids-LyophilicandLyophobiccolloids,classificationofcolloids,stabilityoflyophobicandlyophilic sol, emulsification, foaming, light scattering, destabilization of emulsionsand foams. Isoelectric point, protection of colloids - protective colloids, Gold Number, Hofmeister series, coagulation or flocculation, coacervation, sensitization, micelle and critical micellation concentration, application of colloids. Sedimentation, Coalescence, gelatinization.

UnitIV-Surfacechemistry **9 hrs**

Surfacetension,interfacetension,capillaryeffects,surfaceactivity,surfactants,wetting,contactangle,adsorption-typesandmechanism,catalysis-biocatalyst-enzymes,self-assemblyofmacromolecules,thermodynamicsofself-assembly.

UnitV-Rheology **9 hrs**

Rheological classification of foods. Rheology of solid foods, rheology of liquid foods, Hooke's law, Newtonian flow, non-Newtonian flow, gel flow- viscoelasticity, methods of viscoelasticity. Factors influencing rheological properties, measurement of rheology, application of study of rheology in food industry.

TextBooks:

1. Principlesoffoodchemistry,JohnMDeman,4th edition,AnAspenpublication,Maryland,2018
2. Physicalchemistryoffoods-PieterWalstra,MarcelDekkerIncorporation,TheNetherlands,2003. https://www. dekker.com

Referencebook

1. Introductiontothephysicalchemistryoffood,ChristosRitzoulis,1st edition,CRCpress, 2013

EvaluationPattern

Assessment	Internal	External
Periodical1(P1)+Periodical2(P2)/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar.

GENERICELECTIVE–B(SEMESTERV,VII,VIII)

POST-HARVESTTECHNOLOGY

SemesterV	**HoursofInstruction/week–3**
CourseCode:25FSN375	**No.of Credits–3**
L-T-P – 3-0-0-3	**Total45 hrs.**

Pre-requisite: Post-harvestloss,processingmethods,storage,handling,transportationofcommodities.

CourseObjectives:

1. Tounderstandtheimportanceandmethodsofpost-harvesttechniquesforfoods
2. Togainknowledgeinfoodprocessingandfood conservation

CourseOutcome:

CO1:Gainunderstandingonsignificanceofpost-harvesttechnology. CO2:
Understand the processing of cereals and pulses
CO3:Gainknowledgeondifferentprocessingandpostharvestlossoffruitsandvegetables
CO4:Understandthemethodologiesofdifferentprocessingandpostharvestlossofanimalbasedfoods CO5:
Understand the requirement of storage structures in post harvest technology for plantation crops

Skills: Todevelopskillsinfoodprocessingofplantationcrops

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	-	-	-	1	1	1	-	-	1	-
CO2	2	-	-	-	1	1	1	-	-	1	-
CO3	2	-	-	-	1	1	1	-	-	1	-
CO4	2	-	-	-	1	1	1	-	-	1	-
CO5	2	-	-	-	1	1	1	-		1	-

Syllabus:

UNIT I- Introduction To Post Harvest Technology **9hrs.**

IntroductiontoPostHarvestTechnology-Definition,importanceandproblemencountered.Bufferstock–definition,quantityofstoresavailable.Roleofagenciesincontrollingfoodloss,FCIwarehouses,marketingloss. **UNIT II- Processing of Cereals, Pulses, Nuts and Oil Seeds** **9hrs.**

Processingmethods,factorsaffectingprocessing,postharvestlosses,storagestructuresandinfestation,control methods of insects and pests

UNITIII ProcessingofVegetablesandFruits 9hrs.

Vegetables-Processingmethods,Maturityindex,Changesduringmaturation,selectionofvegetables,post-harvest changes and losses, storage structures and infestation.

Fruits-Processingmethods,Maturityindex,Changesduringmaturation,ripeningoffruits,selectionoffruits,post- harvest changes and losses, storage structures and infestation.

UNIT IV Processing of Meat, Poultry, Dairy and Fish 9hrs.

Meat- Processing, Post-mortem changes, ageing, curing, tenderizing, storage and spoilage.

Poultry-Processing,storageandspoilage.

Fish-Processing,storageandspoilage.

Dairy-Milk,milkproducts,milksubstitutes-Processing-Pasteurization,sterilization,milkspoilage,storageofraw and processed milk

UNIT V- Sugars, Plantation crops, Spices and Condiments 9hrs.

Sugar-Harvesting, post-harvest losses, processing, storage, infestation and its control.

Plantationcrops-Tea,coffee,cocoa-Postharvestlosses,maturation,processing,Fermentation.

Spicesandcondiments-Postharvestlosses,maturation,processing,storagestructures.

RelatedExperiences:

1. VisittoFCI
2. VisittoProcessingMill(Cereal&Pulse)
3. Foodparkwithcoldstorage

ReferenceBooks:

1. Handlingandstorageoffoodgrains-SVPingaleICAR,NewDelhi,1976.
2. Handlingandstorageoffoodgrainsintropicalandsubtropicalareas-DWHall,FAD,Rome,1970.
3. FoodScience,N.W.Potter-TheAVIPublishingCo.,TheWestport,1973.
4. FoodTechnology,PrescottandProctor.B.B.McGrawHillBookCo.,NewYork,1937.
5. GordonGBirth,Foodscience,PubinNewYork.
6. RobinsMPhilipConveniencefood-RecentTechnology1976.
7. TechnologyofcerealsbyNLKentandJADEvers.
8. FoodprotectiontechnologybyCharlesW.,FelixHavisPub.1987.
9. JohnATroller,1983,Sanitationinfoodprocessing,Academicpress

EvaluationPattern

Assessment	Internal	External
Periodical1&Periodical2/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FOODBIOTECHNOLOGY

Semester: V, VII, VIII	**HoursofInstruction/week–3**
CourseCode:25FSN376	**No.of Credits–3**
L-T-P –C 3 0 0 -3	**Total45 hrs.**

Prerequisite: Geneticengineering,enzymesandmicrobes,fermentation

CourseObjectives:

1. Togiveanunderstandingontheroleofenzymesasatoolingeneticengineeringandbiotechnology
2. Tomakelearnersawareontheprinciplesofgeneticengineering,planttissueultureandmolecularcloning
3. Toenablelearnerstounderstandtheconceptoffermentation biotechnology
4. Todelineatetheroleofmicrobesintheapplicationofbiotechnologyin FoodScienceandNutrition

CourseOutcomes:

CO1:Gainknowledgeontheenzymesastoolsusedingeneticengineering
CO2:Expandtheknowledgeoffoodbiotechnologyinrelationtogeneticengineeringandplanttissueculture. CO3: Understand on the basic principles of fermentation technology and the application of fermentation in biotechnological industry.
CO4:Helpstokeepabreastapplicationofmicrobesinfoodindustry. CO5:
Understanding the role of enzymes in food industry.

Skills: Developappropriateskillsinvolvedinfoodbiotechnologyandgeneticengineering

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	1	-	-	-	-	-	-	-	1	1
CO2	1	1	-	-	-	-	-	-	-	1	1
CO3	1	1	-	-	-	-	-	-	-	1	1
CO4	-	1	-	-	-	-	-	-	-	1	-
CO5	1	1	-	-	-	-	-	-	-	1	-

Syllabus:

Unit I - Introduction and Tools of Genetic Engineering **10hrs.**

Definition,enzymesastools-exonucleases,endonucleases,ligases,reversestranscriptaseandalkaline phosphatase, cloning vectors-plasmids, bacteriophage, cosmids and phasmids. Nutrigenomics and its nutritional implications.

UnitIIGeneticEngineeringandPlantTissueCulture **10hrs.**

Outlineofgeneticengineeringinprokaryotes(microbialcells),conceptsofmolecularcloning,planttissueculture, micro propagation, transgenic plants, genetically modified foods-golden rice, flavr savr tomato and Bt brinjal; enlisting applications of genetic engineering, isolation of DNA and Plasmids.

UnitIII-FermentationBiotechnology **8hrs.**

Generalstructureofbioreactorsandlistingtypes,bacterialgrowthcurve,batchandcontinuousculture, environmental factors, basic concepts of downstream processing, definition of biochips and biosensors

UnitIV-UseofMicrobesinFood Industry **8hrs.**

Primarymetabolites,secondarymetabolites,synthesisofcitricacid,glutamate,xanthangum,vitaminB12, riboflavin and Single Cell Protein – spirulina and yeast biomass

UnitV-EnzymeBiotechnology **9hrs.**

Solubleenzymes,immobilizationofenzymes–methodsofimmobilization,roleofenzymesinfoodindustry,safety assessment of transgenic crops

TextBooks:

1. Dubey,R.C.,2014,ATextBookofBiotechnology,5th revisededition,S.ChandandCompanyLtd.,New Delhi.
2. Green,P.J.,2010,IntroductiontoFoodBiotechnology,CRCPress,USA.

ReferenceBooks:

1. DietrichKnorr,2017,FoodBiotechnology,MarcelDekkerInc.,NewYork.
2. Owen,P.Ward, 2018,Fermentation Biotechnology, Principles, Processes and Products, Prentice Hall, Advanced Reference Series, New Jersey, 07632

EvaluationPattern:

Assessment	Internal	External
Periodical1(P1)+Periodical2(P2)/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

NUTRITIONEDUCATIONANDCOMMUNICATION

Semester: V, VII, VIII	**HoursofInstruction/week–3**
CourseCode:25FSN377	**No.ofCredits–3**
L-T-P – 3 0 0 -3	**Total45 hrs.**

Prerequisite: Nutrition&counseling.

CourseObjectives:

1. Toexposeonthemethodsofnutritioneducation
2. UnderstandthesignificanceofInformationEducationandCommunication(IEC)toolsfornutrition education
3. Developskillsonhowtoplan,executeandevaluateanutritioneducationprogramme.

CourseOutcomes:

CO1:Understandappropriateskillsfordevelopingnutritioneducationmaterials

CO2:Gainknowledgeonmasscommunication,mediaandaidtoolsfornutritioneducation CO3:

Utilize different communication tools for nutrition education

CO4:Gainedknowledgetoorganizenutritioneducationprogrammes

CO5:Understandthevariousapproachesandstrategiesforimprovingnutritionalstatusandhealth

Skills: Developskillsinorganizingnutritioneducationprogrammes

CO-POMappings

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	-	-	1	3	3	-	1	-	-	1
CO2	1	-	-	1	3	3	-	1	-	-	1
CO3	1	-	-	1	3	3	-	1	-	-	1
CO4	1	-	-	1	3	3	-	1	-	-	1
CO5	1	-	-	1	3	3	-	1	-	-	1

Syllabus:

UnitI-NutritionEducation **9hrs.**

Nutrition Education Meaning, nature and importance of nutrition education to the community and the lessons to be taught. Training workers in nutrition education programs, integration of nutrition education with education and extensionwork.Principlesofplanning,executingandevaluatingnutritioneducationprograms,problemsofnutrition education, Nutrition education approaches

Methods of Nutrition Education - Direct and Indirect Methods , Individual and Group Contacts, Types, Methods (Parti,cipatory Leaning Method, Village Resource mapping, Focus group discussion), Merits and Demerits

Unit II - Mass Communication in Nutrition Education **9hrs.**

Definition,MeritsandDemerits,Types–PrintMedia,Newspapers,Magazine,Leaflets,Pamphlets,Radio, Television, Films, Film Strips

UnitIII-ToolsinNutritionEducation **9hrs.**

IECMaterials-SignificanceofIECmaterials,types,AdvantagesandLimitations,DesignanddevelopmentofIEC materials

RelatedExperiences

Preparationofchartorposterorleaflets

DigitalHealthInterventions:MobileHealth,MobileApp,onlinecommunication,Dietarysurvey,Websources

UsesofFolkMediainNutritionEducation-TypesofFolkMedia,Meritsand Demerits

Related Experiences

PreparationofSkitsorPuppetShowsorVillupattu

UnitIV-OrganizingProgrammesinNutritionEducation **9hrs.**

Introduction–SelectionofTheme, PlanningtheProgramme,Executingthe Programme, EvaluationoftheProgramme

Unit V Approaches and Strategies for improving nutritional status and health **9hrs.**

ApproachesandStrategiesforimprovingnutritionalstatusandhealth,Health–basedinterventions,Food– based interventions including fortification and genetic improvement of foods, supplementary feeding, Nutrition education for behaviour change, environmental sanitation, Food Nutrition and health WASH interventions, National and state governmental nutrition education intervention programmes.

Textbooks:

1. Srilakshmi,B.,NutritionScience,8th Edition,NewAgeInternational(P)Ltd.,NewDelhi,2023.
2. NutritionEducation:LinkingResearch,Theory,AndPractice,2020,IsobelR.Contento,PamelaAKoch, 4th Edition, Jones and Bartlett Publishers, Inc

Referencebooks:

1. Textbookofcommunitynutrition,6thedition,Suryatapadas,2023
2. CommunityNutritionbyVSrilakshmi,B;Suganthi,2022
3. CommunityNutritionandHealthbyBhavanaSabarwal, 2023
4. FoodNutritionandCommunityHealth,Dr.VikasSingh&Dr.Gyanendrakumar,2020

EvaluationPattern

Assessment	Internal	External
Periodical1(P1)+Periodical2(P2)/Midterm	30	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA-CanbeQuizzes,Assignment,Projects,andReports,andSeminar

FREE ELECTIVES OFFERED UNDER HUMANITIES / SOCIAL SCIENCE STREAMS COMMON TO ALL PROGRAMS

23CUL230	ACHIEVINGEXCELLENCEINLIFE-ANINDIANPERSPECTIVE	L-T-P-C:2-0-0-2

CourseObjectives:

The course offers to explore the seminal thoughts that influenced the Indian Mind on the study of human possibilitiesfor manifesting excellence in life. This course presents to the students, an opportunity to study the Indian perspectiveof Personality Enrichment through pragmatic approach of self analysis and application.

SyllabusUnit

1
Goalsof Life–Purusharthas
What are Purusharthas (Dharma, Artha, Kama, Moksha); Their relevance to Personal life; Family life; Sociallife& Professional life;Followedbya Goalsettingworkshop;
YogicwayofAchievingLifeGoals–(StressFree&FocusedLife)
Introduction to Yoga and main schools of Yoga; Yogic style of Life & Time Management (Work Shop);
Experiencing life through its Various Stages
AshramaDharma;Attitudetowardslifethroughitsvariousstages(TeachingsofAmma);

Unit2
PersonalityDevelopment
WhatisPersonality–FiveDimensions–PanchaKosas(Physical/Energy/Mental / Intellectual / Bliss); Stress Management & Personality; Self Control & personality; Fundamental Indian Values & Personality;
LearningSkills(TeachingsofAmma)
Art of Relaxed Learning; Art of Listening; Developing 'Shraddha' –a basic qualification for obtaining Knowledge; Communication Skills - An Indian Perspective;

Unit3
DevelopingPositiveAttitude&Friendliness-(VedicPerspective);
Achieving Work Excellence (Karma Yoga by Swami Vivekananda & teachings based on Amma);Leadership Qualities – (A few Indian Role models & Indian Philosophy ofLeadership);

REFERENCEBOOKS:

1. *AwakenChildren(DialogueswithSriMataAmritanandamayi)Volumes1to9*
2. *CompleteworksofSwamiVivekananda(Volumes1to9)*
3. *MahabharatabyM.NDuttpublishedbyParimalpublications–NewDelhi(Volumes1to9)*
4. *UniversalmessageofBhagavad-Gita(AnexpositionofGitainthelightofmodern thought and Modernneeds) by Swami Ranganathananda. (Vols.1 to 3)*
5. *MessageofUpanishads,bySwamiRanaganathanandapublishedbyBharatiyaVidyaBhavan,Bombay.*
6. *PersonalityDevelopment–SwamiVivekanandapublishedbyAdvaithaAshram,Kolkatta.*
7. *ArtofManMaking-SwamiChinmayanandapublishedbyChinmayaMission,Bombay*
8. *WillPoweranditsDevelopment-SwamiBudhanandapublishedbyAdvaithaAshram,Kolkatta*
9. *Ultimate Success - Swami Ramakrishnananada Puri published by Mata Amritanandamayi Math, Kollam*
10. *YogaInDailyLife-SwamiSivananda–publishedbyDivineLifeSociety*
11. *HinduDharma- H.H.SriChandrasekharandra Saraswatipublishedby BharatiyaVidya Bhavan, Bombay*

12. *AllaboutHinduism–SwamiSivananda-PublishedbyDivineLifeSociety*
13. *TheMindanditsControlbySwamiBudhanandapublishedbyAdvaithaAshram,Kolkatta*
14. *KridaYoga-VivekanandaKendra,Publication.*
15. *ValmikiRamayana–Fourvolumes-publishedbyParimalPublications,Delhi*
16. *New perspectives in Stress Management - Dr H R Nagendra & Dr R Nagaratna published by SwamiVivekananda Yoga Prakashana, Bangalore.*
17. *MindSoundResonanceTechnique(MSRT)PublishedbySwamiVivekanandaYoga Prakashana,Bangalore.*
18. *Yoga & Memory - Dr H R Nagendra & Dr. Shirley Telles,published by SwamiVivekanandaYogaPrakashana, Bangalore.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23CUL231	EXCELLENCEINDAILYLIFE	L-T-P-C:2-0-0-2

Syllabus

Unit1

1. Theanatomyof‘Excellence’.Whatis‘excellence’?Isitjudgedbyexternalfactorslikewealth?
2. The Great Flaw. The subject-object relationship between individual and world. Promotesubjectenhanceexcellence.
3. Toworktowardsexcellence,onemustknowwhereheis.Ourpresentstate...An introspective analysis.Our faculties within.

Unit2

4. Theplayofthemind.Emotions–convertweaknessintostrength.
5. Theindispensibleroleoftheintellect.Howtoachieveandapplyclearthinking?
6. Thequagmireofthought.ThedoctrineofKarma–LawofDeservance.
7. IncreaseProductivity,reducestress..workpatterning.

Unit3

8. Theartofrightcontactwiththeworld.assessment,expectations.
9. MythsandRealitiesonkeyissueslikerichness,wisdom,spirituality.
10. Collectyourself,thereisnotimetowaste.Theblue-printofperfectaction.

REFERENCES:

TheBhajaGovindamandtheBhagavadGita.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23CUL232	EXPLORINGSCIENCEANDTECHNOLOGYINANCIENTINDIA	L-T-P-C:2-0-0-2

OBJECTIVES:

This course offers a journey of exploration through the early developments in India of astronomy, mathematics,technologies and perspectives of the physical world. With the help of many case studies, the students will be equipped to understand concepts as well as well as actual techniques.

SyllabusUnit

1

1. Generalintroduction:principlesfollowedandsources;
2. Astronomy&mathematicsfromtheNeolithictotheInduscivilization;
3. Astronomy&mathematicsinVedicliterature;
4. VedangaJyotishaandthefirstIndiancalendars;
5. ShulbaSutrasandthefoundationsofIndiangeometry;

Unit2

1. Astronomy&mathematicsinJainandBuddhistliterature;
2. ThetransitiontotheSiddhanticperiod;Aryabhataandhistime;
3. TheAryabhatiya:concepts,content,commentaries;
4. Brahmaguptaandhisadvances;
5. OthergreatSiddhanticsavants;
6. BhaskaraIIandhisadvances;

Unit3

1. TheKeralaschoolofmathematics;
2. TheKeralaschoolofastronomy;
3. DidIndiansciencedieout?;
4. OverviewofrecentIndianscientists,fromS.Ramanujanonward;
5. Conclusion:assessmentanddiscussion;

TEXTBOOK:

IndianMathematicsandAstronomy:SomeLandmarks,byS.BalachandraRao

REFERENCE:

*IFIH'sinteractivemultimediaDVDonScience&TechnologyinAncient*India.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23CUL233	YOGAPSYCHOLOGY	L-T-P-C:2-0-0-2

OBJECTIVES:

This course offersthefoundation necessary tounderstand Easternapproachesto psychology and spirituality.Thecourseincludesexperientialcomponentscenteringonmeditationandspiritualpractice.

SyllabusUnit

1
Introduction
IntroductiontoModernPsychology
AshorthistoryofModernPsychology -MajorSchoolsofModernPsychology-Thethreemajorforcesin WesternPsychology-FreudianPsychoanalysis;Behaviourism;HumanisticPsychology.

IntroductiontoIndianPsychology
WhatisYoga?-RiseofYogaPsychologytradition-VariousschoolsofYogaPsychology-Universal Goal of allYoga-schools.

PatanjaliYogaSutra–1
IntroductiontoRishiPatanjali-BirdviewofYoga-Sutra-DefinitionofYoga–Vrittis.

PatanjaliYogaSutra–2
FiveKindsofVrittis -Pramanam-sourcesofrightknowledge -Viparyayah–unfoldedbelief -Vikalpah– Unfoldedbelief - Smriti – Memory.

Unit2
PatanjaliYogaSutra–3
Twoformulae-NecessityofAbhyasahandVairagyah-FoundationofAbhyasah-FoundationofVairagyah.

PatanjaliYogaSutra–4
Introduction to Samadhi - Samprajnata-Samadhi - Reasoning in Samprajnata-Samadhi - Reflection in Samprajnata- Samadhi - Bliss in Samprajnata-Samadhi - Sense of Individuality in Samprajnata-Samadhi.

PatanjaliYogaSutra–5
Main obstacles in the path of Yoga - other obstructions - removal of obstacles by one – pointedness; by controlling Prana-byobservingsenseexperience-byinnerillumination-bydetachmentfrommatter-byknowledgeofdream andsleep -by meditationasdesired.

PatanjaliYogaSutra–6
How to make mind peaceful? - Cultivating opposite virtues: happiness – friendliness - misery – compassion - virtue – gladness - vice – indifference.

PatanjaliYogaSutra–7
FivecausesofPain-avidya–ignorance(RootCause)-asmita–'I-Feeling'–raga– attraction-dwesha – repulsion -abhinivesha–clingingtolife.

Unit3
PatanjaliYogaSutra–8
NecessityofYogapractice-eightpartsofYogapractice-fiveYamas:ahimsa–satya–asteya–brahmacharyam – aparigraha.

PatanjaliYogaSutra–9
Five Niyamas: Soucha – Santhosha – Tapas – Swadyah – Ishwara - Pranidhanam.
Patanjali Yoga Sutra – 10
Asanam – Pranayamah - various kinds of Pranayamah - Pratyaharah - Masteryover the senses.Report review Conclusion

REFERENCES:

1. *Thecourse book willbe "Thefourchapters of Freedom"written by Swami Satyananda Saraswati of BiharSchool of Yoga, Munger, India.*
2. *"The message of Upanishads" written by Swami Ranganathananda. Published by Bharathiya VidyaBhavan.*
3. *EightUpanishadswiththecommentaryofSankaracharya,TranslatedbySwami Gambhirananda,Published by Advaita Ashram, Uttaranjal.*
4. *'HathaYogaPradipika'SwamiMuktibodhananda,YogaPublicationsTrust,Munger,Bihar,India*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23ENG230	BUSINESSCOMMUNICATION	L-T-P-C:1-0-3-2

OBJECTIVES:

To introduce business vocabulary; to introduce business style in writing and speaking; to expose students to thecross-cultural aspects in a globalised world; to introduce the students to the art of persuasion and negotiation inbusiness contexts.

CourseOutcomes

CO1: Familiarize and use appropriate businessvocabulary and etiquettesin verbal communicationin theprofessional context
CO2: Understandorganizationalstructures,paystructuresandperformanceassessments
CO3: Apply language skills in drafting various business documents and other necessary communications in thebusiness context
CO4: Understand and address cross cultural differences in the corporate environmentCO5: Participate in planned and extempore enactments of various business situations

CO-POMapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										3		2
CO2									1		1	
CO3										3		
CO4						2						
CO5									2			

SyllabusUnit

1
BusinessVocabulary-Writing:DraftingNotices,Agenda,andMinutes-Reading:Businessnews,Businessarticles.

Unit2
Writing:Styleandvocabulary-BusinessMemorandum,letters,PressReleases,reports–proposals–Speaking: Conversational practice, telephonic conversations, addressing a gathering, conducting meetings.

Unit3
ActiveListening:Pronunciation–informationgatheringandreporting-Speaking:Cross-Cultural Issues, GroupDynamics, negotiation& persuasion techniques.

Activities
Casestudies&role-plays.

BOOKSRECOMMENDED:

1. *Jones,Leo&RichardAlexander.NewInternationalBusinessEnglish.CUP.2003.*
2. *Horner,David&PeterStrutt.WordsatWork.CUP.1996.*
3. *Levi,Daniel.GroupDynamicsforTeams.3ed.SagePublicationsIndiaPvt.Ltd.NewDelhi,2011.*
4. *Owen,Roger.BBCBusinessEnglish.BBC.1996.*
5. *Henderson,GretaLafollette&PriceRVoiles.BusinessEnglishEssentials.7thEdition. Glencoe / McGrawHill.*
6. *Sweeney,Simon.CommunicatinginBusiness.CUP.2000.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23ENG231	INDIANTHOUGHTTHROUGHENGLISH	L-T-P-C:2-0-0-2

OBJECTIVES:

Toexpose the studentstothe greatnessof IndianThought in English;to developa sense of appreciation for the lofty Indian Thought; to develop an understanding of the eclectic Indian psyche; to develop an understanding about thesocietalchangesintherecentpast.

SyllabusUnit

1Poems
Rabindranath Tagore's Gitanjali (1-10); Nizzim Ezekiel's Enterprise; A.K. Ramanujam's Small-Scale Reflectionson a Great House.

Unit2

Prose
KhushwantSingh'sThePortraitofaLady;JhumpaLahiri'sShortStory-InterpreterofMaladies.

Unit3

DramaandSpeech
VijayTendulkar'sSilence,theCourtisinSession;MotivationalspeechesbyJawaharlalNehru/S.Radhakrishnan /A.P.J.AbdulKalam'sMyVisionforIndiaetc.(anyspeech).

REFERENCES:

1. *Lahiri,Jhumpa.InterpreterofMaladies,HarperCollinsPublications,2000.*
2. *RamanujanA.K.ed.K.M.George,ModernIndianLiterature:AnAnthology,Vol.I, Sahitya Akademi,1992.*
3. *Singh,Khushwant.ThePortraitofaLady:CollectedStories,Penguin,2009.*
4. *Tagore,Rabindranath.Gitanjali,PenguinBooksIndiaPvt.Ltd,2011.*
5. *Tendulkar,Vijay.FivePlays,OxfordUniversityPress,1996.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23ENG232	INSIGHTSINTOLIFETHROUGHENGLISHLITERATURE	L-T-P-C:2-0-0-2

OBJECTIVES:

Toexposethestudentstodifferentgenresof Literature;tohonereadingskills; toprovidedeepercriticaland literaryinsights;toenhancecreativethinking;topromoteaestheticsense.

SyllabusUnit

1Poems
1.W.H.Auden:RefugeeBlues;2.A.K.Ramanujan:Obituary;3.WilliamBlake:TheLittleBlackBoy;4.Gieve Patel: Grandparents at a Family Get–together.

Unit2

ShortStories
1. Chinua Achebe: Marriage is a Private Affair; 2. Ruskin Bond: The Thief; 3. Isai Tobolsky: Not Just Oranges; 4.K A Abbas: The Refugee

Unit3

Prose

1. AGGardiner:OnThePhilosophyofHats;2.RobertLynd:Mispronunciation

Practicals:

Roleplays:TheProposal,Chekov/RememberCeaser,GordonDaviot/FinalSolutions,Mahesh Dattani, Bookreviews, Movie reviews.

SUGGESTEDREADING:
TheOldManandtheSea,Hemingway/AnyoneofthenovelsofR.K.Narayan,etc.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23ENG233	TECHNICAL COMMUNICATION	L-T-P-C:2-0-0-2

OBJECTIVES:

To introduce the students to the elements of technical style; to introduce the basic elements of formal correspondence;tointroducetechnical paper writingskillsand methods of documentation; toimprove oral presentation skills in formal contexts.

CourseOutcomes:

Afterthecompletionofthecoursethestudentwillbeableto:

CO1: Understand and use the basic elements of formal correspondence and methods of documentationCO2: Learn to edit technical content for grammatical accuracy and appropriate tone and style
CO3: Usethelibraryandinternetrecoursesforresearchpurposes
CO4: Demonstrate the ability to communicate effectively through group mock-technical presentations and other activities

Mappingofcourseoutcomeswithprogramoutcomes:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1										3				
CO2										3				
CO3				1										
CO4									3	3				

Syllabus:

Unit1
Mechanicsofwriting:Grammarrules–punctuation-spellingrules-toneandstyle-graphicalRepresentation.

Unit2
Different kinds of written documents: Definitions – descriptions – instructions – recommendations - manuals -reports – proposals; Formal Correspondence: Letter Writing including job applications with Resume.

Unit3
Technical paper writing: Library research skills - documentation style - document editing – proofreading –formatting.

PracticeinoralcommunicationandTechnicalpresentations

REFERENCES:

1. *Hirsh,Herbert.L"EssentialCommunicationStrategiesforScientists,Engineers andTechnologyProfessionals". II Edition. New York: IEEE press, 2002*
2. *Anderson, Paul. V. "Technical Communication: AReader-Centred Approach". V Edition. Harcourt BraceCollege Publication, 2003*
3. *Strunk,WilliamJr.andWhite.EB."TheElementsofStyle"NewYork.Alliyan&Bacon,1999.*
4. *Riordan,G.Danieland Pauley E.Steven. "TechnicalReportWriting Today"VIII Edition(IndianAdaptation). New Delhi: Biztantra, 2004.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23ENG234	INDIANSHORTSTORIESIN ENGLISH	L-T-P-C:2-0-0-2

OBJECTIVES:

Tohelpthestudentslearnthefineartofstorywriting;tohelpthemlearnthetechniquesofstorytelling; tohelpthemstudyfictionrelatingittothesocio-culturalaspectsoftheage;tofamiliarizethemwithdifferent strategies of reading shortstories; tomakethemfamiliarwith themoralsandvaluesheldin highesteem by the ideals of Indianness.

SyllabusUnit

1
Introduction:Differencesbetween novelandshortstories–originanddevelopmentofshort stories -Rabindranath Tagore: Kabuliwallah; Mulk Raj Anand: The Gold Watch.

Unit2
R.K.Narayan:SweetsforAngels;K.A.Abbas:TheRefugee;KhushwantSingh:TheMarkofVishnu.

Unit3
MastiVenkateshaIyengar:TheCurds-Seller;ManoharMalgonkar:UpperDivisionLove;Romila Thapar: The Spell; Premchand: The Voice of God.

TEXT:
M.G.NarasimhaMurthy(ed),FamousIndianStories.Hyderabad:OrientBlackSwan,2014

REFERENCE:
Mohan Ramanan (Ed), English and the Indian Short Story: Essays in Criticism, Hyderabad, OrientBlack Swan,2000.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23FRE230	PROFICIENCYINFRENCHLANGUAGE(LOWER)	L-T-P-C:2-0-0-2

SyllabusUnit

1

Population-Identity
How to introduce yourself (name, age, address, profession, nationality); Numbers; How to ask questions; Grammar–Pronouns-subjects;Regularverbsof1stgroup(er)inthepresent;Être(tobe) andavoir (to have) inthe present; Interrogative sentence; Gender of adjectives.

Unit2

Thesuburbs-Atthetrainstation
Introducesomeone;Buyatrainticketoracinematicket;Askforinformation;Officialtime;Askfora price; Thecity (church, town hall, post office…)
Grammar – Pronouns - subjects (continuation); Gender of adjectives (continuation); Plural of nouns and adjectives;Definiteandindefinitearticles;Interrogativeadjectives;Iwouldlike(Jevoudrais).

Unit3

Parisandthedistricts-Lookingforaroom
Locate a room and indicate the way; Make an appointment; Give a price; Ordinal numbers; Usual time; Ask for thetime.
Grammar-Imperativemode;Contractedarticles(au,du,des);negation.

TEXTBOOK:
MetroStMichel-Publisher:CLEinternational

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23FRE231	PROFICIENCYINFRENCHLANGUAGE(HIGHER)	L-T-P-C:2-0-0-2

SyllabusUnit

1

Thefirstroomofastudent
A party to celebrate the 1st room; Descriptionof a room; furniture; Locate objects: prepositions (devant,derrière,dans…), Read advertisement; Appreciation (I like, I prefer,).

Grammar -Perfect past tense withavoir; Possessive adjectives (mon,ton,son…); Demonstrative adjectives (ce, cet, cette); Yes (oui, si).

Unit 2 Small

jobs
Conversation on the phone; Give Time indications; Answer a job offer; Describe a job; Suggest a meeting time.Grammar-Perfectpasttensewithêtreandavoir(continuation);Possessive adjectives(notre,votre,leur);Prepositions(à,pour,avec…);Pronounasdirectobject(le,la,l',les).

Unit3

UniversityRestaurant
Inquiry; Express an opinion; Ask questions (continuation); Food, meals, taste, preferences; Nutrition,diet, choosea menu or diet, Expression of quantities (beaucoup, peu).

Grammar-Partitif(expressingquantity) (du,dela,pasde.…); Comparison(plus...que,moins….que,autant …que);Interrogation(continuation),inversion,Est-ceque,qu'est-ceque?.

TEXTBOOK:
MetroStMichel-Publisher:CLEInternational

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23GER230	GERMANFORBEGINNERSI	L-T-P-C:2-0-0-2

Syllabus

Unit 1
Greetings; Introducing one-self (formal and informal context), saying their name, origin, living place, occupation.Numbers1-100;Sayingthetelephonenumber.CountriesandLanguages.
Grammar: Structure – W - Questions and Yes/No questions and statements, personal pronouns, verb conjugations.Articles.
Vocabulary:Professions.

Unit2
Givingthepersonaldetails.Name,age,maritalstatus,yearofbirth,placeofbirth,
etc.Numbers till 1000. Saying a year. Alphabets – spelling a word.
Fillingupanapplicationform;Intherestaurant–makinganorder.
Grammar: Definite, indefinite and negative article in nominative. Accusative: indefinite and negative Article Vocabulary: Food items

Unit3
Numbers above 1000. Orientation in Shopping plazas: asking the price, where do I find what, saying the opinion.Grammar: Accusative – definite article. Adjectives and plural forms. Vocabulary: Furniture andcurrencies.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23GER231	GERMANFORBEGINNERSII	L-T-P-C:2-0-0-2

Syllabus

Unit 1
Shopping and orientation in supermarket; Conversation between the customer and salesman; Where one findswhat in supermarket;Asking for requests and suggestions.

Grammar:Dativeofpersonalpronouns.Imperativeform.Vocabulary:Consumablesandmeasurements;

Unit2
Appointments;Workandleisuretimeactivities;Time,weekdays,monthsandseasons;sayingthedate; fixing upan appointment.

Grammar: Model verbs; Prepositionswith time and place; Ordinal numbers. Vocabulary: Leisure activities,weekdays, months and seasons.

Unit3
Family and household; Family and relations; household and daily routine. Grammar: Possessive articles; Divisibleand indivisible verbs.
Vocabulary:Familycircle;Householdarticles.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23GER232	PROFICIENCYINGERMANLANGUAGE(LOWER)	L-T-P-C:2-0-0-2

Syllabus

TohaveanelementaryexposuretoGermanlanguage;specifically

1. tohavesomeabilitytounderstandsimplespokenGerman, andtobeabletospeakitso as to be able tocarry onlife inGermany withoutmuchdifficulty(to beable to do shopping, etc.);
2. tobeabletounderstandsimpletexts,andsimpleformsofwrittencommunication;
3. tohaveabasicknowledgeofGermangrammar;
4. toacquireabasicvocabularyof500words;
5. tobeabletotranslatesimpleletterswiththeuseofadictionary;and
6. tohavesomefamiliaritywiththeGermanlifeandculture.

(This will not be covered as part of the regular classroom teaching; this is to be acquired by self-

study.)Some useful websites will be given.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23GER233	PROFICIENCYINGERMANLANGUAGE(HIGHER)	L-T-P-C:2-0-0-2

Syllabus

The basic vocabulary and grammar learned in the earlier course is mostly still passive knowledge. Theendeavourof this course is toactivate thisknowledge and develop the skill of communication.

Topics are: Airport, railway station, travelling; shopping; invitations, meals, meeting people; around the house; the human body; colours; professions.

Pastandfuturetenseswillbeintroduced.Applyinggenitive,dativeandaccusative.SomeGermanculture.Films.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM230	EMOTIONALINTELLIGENCE	L-T-P-C:2-0-0-2

Syllabus

Unit 1

Emotional Intelligence: Concept of Emotional Intelligence, Understanding the history and origin of EmotionalIntelligence,ContributorstoEmotionalIntelligence,Science ofEmotionalIntelligence,EQ and IQ, Scope of Emotional Intelligence.

Unit2

Components of Emotional Intelligence: Self-awareness, Self-regulation, Motivation, Empathy, Socialskills. Emotional Intelligence Competencies, Elements of Emotional Intelligence, Models of Emotional Intelligence: The Ability-based Model, The Trait Model of Emotional Intelligence, Mixed Models of EmotionalIntelligence.

Unit3

Emotional Intelligence at Work place: Importance of Emotional Intelligence at Work place? Cost–savingsofEmotionalIntelligence,EmotionallyIntelligentLeaders,CaseStudiesMeasuringEmotional Intelligence: Emotionally Intelligence Tests, Research on Emotional Intelligence, Developing Emotional Intelligence.

REFERENCES:

1. *DanielGoleman(1996).EmotionalIntelligence-WhyitcanMatterMorethanIQ. Bantam Doubleday Dell Publishing Group*
2. *Daniel Goleman (2000). Working with Emotional Intelligence. Bantam Doubleday Dell Publishing Group*
3. *Liz Wilson, Stephen Neale & Lisa Spencer-Arnell (2012). Emotional Intelligence Coaching. Kogan PageIndia Private Limited*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM231 GLIMPSES INTO THE INDAN MIND -THE GROWTH OF MODERN INDIA
L-T-P-C: 2-0-0-2

SyllabusUnit1
Introduction
General Introduction; 'His + Story' or 'History' ?; The concepts of 'nation', 'national identity' and'nationalism';Texts and Textualities: Comparative Perspectives.

Unit2
Selectedwritings/selectionsfromthecompleteworksofthefollowingauthorswillbetakenupfor study in achronological order:
RajaRamMohanRoy;DayanandaSaraswati;BalGangadharTilak;RabindranathTagore;

Unit3
Selectedwritings/selectionsfromthecompleteworksofthefollowingauthorswillbetakenupfor study in achronological order:
SwamiVivekananda;SriAurobindo;AnandaK.Coomaraswamy;SisterNivedita;MahatmaGandhi; JawaharlalNehru;B.R.Ambedkar;SriChandrasekharendra Saraswati,theParamacharyaofKanchi; Dharampal; Raja Rao;
V.S.Naipaul.

Conclusion.

REFERENCES:

1. *Tilak,BalGangadhar.TheOrion/ArcticHomeintheVedas.*
2. *Tagore,Rabindranath.TheHistoryofBharatavarsha/OnNationalism/GreaterIndia.*
3. *Vivekananda, Swami. "Address at the Parliament of Religions"/"The Future of India"/"InDefenceofHinduism"fromSelectionsfromtheCompleteWorksofSwami Vivekananda.*
4. *Aurobindo,Sri.TheRenaissanceinIndia/OnNationalism.*
5. *Coomaraswamy,AnandaK.EssaysinIndianIdealism(anyoneessay)/DanceofShiva.*
6. *Nivedita,Sister."NoblesseOblige:AStudyofIndianCaste"/"TheEasternMother" from The Web ofIndian Life.*
7. *Gandhi,Mahatma.HindSwaraj.*
8. *Nehru,Jawaharlal."TheQuest"fromDiscoveryofIndia.*
9. *Ambedkar,B.R."BuddhaandHisDhamma"fromCollectedWorks.*
10. *Saraswati,Chandrasekharendra."TheSastrasandModernLife"fromTheHinduDharma.*
11. *Dharampal.BharatiyaChitta,ManasandKala/UnderstandingGandhi.*
12. *Naipaul,V.S.India:AWoundedCivilization/India:AMillionMutiniesNow.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM232	GLIMPSESOFETERNALINDIA	L-T-P-C:2-0-0-2

Syllabus

Unit 1

Introduction

ApeepintoIndia'sgloriouspast

AncientIndia–thevedas,thevedicsocietyandtheSanatanaDharma–rajamandalaandthe Cakravartins – Ramarajya – Yudhisthira's ramarajya; Sarasvati - Sindhu Civilization and the myth of the Aryan Invasion; Classical India – Dharma as the bedrock of Indian society – Vaidika Brahmanya Dharma and the rise of Jainism and Buddhism

– the sixteen Mahajanapadas and the beginning of Magadhan paramountcy - Kautilya and his Arthasastra – ChandraguptaMauryaandtheriseoftheMauryanempire–GuptadynastyIndianartand architecture – classicalsanskrit literature – Harsavardhana; Trade and commerce in classical and medievalIndiaandthestoryofIndiansupremacy in the Indian ocean region; The coming of Islam – dismantling of the traditional Indian polity – the Mughal empire – Vijayanagara samrajya and days of Maratha supremacy.

Unit2

India'scontributiontotheworld:spirituality,philosophyandsciences

Indian Philosophy – the orthodox (Vaidika) and the heterodox (atheistic) schools; Ramayana and Mahabharata;BhagavadGita;Saintsandsages ofIndia;AncientIndianmedicine:towardsanunbiased perspective; Ancient Indian mathematics; Ancient Indian astronomy; Ancient Indian science and technology.

ThearrivalofEuropeans,Britishparamountcyandcolonization

WhatattractedtherestoftheworldtoIndia?;IndiaontheeveofthearrivalofEuropeanmerchants;The story ofcolonization and the havoc it wrecked on Indian culture and civilization; Macaulay and the start of thedistortionofIndian education and history; Indian economy – before and after colonization: a brief survey; The emergence ofmodern India.

Unit3

WomeninIndiansociety

The role and position of women in Hindu civilization; Gleanings from the Vedas, Brihadarnyaka Upanishad, SaptasatiDeviMahatmyam,Ramayana,Mahabharata,Manusmriti,Kautilya'sArthasastra and Mrichchhakatikamof Sudraka; The role and position of Indian women vis-a-vis Islam and European cultures; The great women of India.

ModernIndia

The national movement for freedom and social emancipation; Swami Vivekananda, Sri Aurobindo, RabindranathTagore;UnderstandingMahatmaGandhi;Anewnationisbornasarepublic–thepangs of birth and growth; IndiasinceIndependence–thesagaofsocio-politicalmovements;Problemsfacingthe nationtoday;Globalizationand Indian Economy;Bharatavarshatodayand thewayahead: Regeneration of Indian National Resources.

Conclusion

TheWonderthatwasIndia;The'politics'and'purpose'ofstudyingIndia.

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1. *Parameswaran,S.TheGoldenAgeofIndianMathematics.Kochi:SwadeshiScienceMovement.*
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3. *Sen,S.N.&K.V.Sarmaeds.AHistoryofIndianAstronomy.NewDelhi,1985.*
4. *Rao,S.Balachandra.IndianAstronomy:AnIntroduction.Hyderabad:UniversitiesPress,2000.*
5. *Bose,D.M.et.al.AConciseHistoryofScienceinIndia.NewDelhi:1971.*
6. *Bajaj,Jitendra&M.D.Srinivas.IndianEconomyandPolity.Chennai:CentreforPolicyStudies.*
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9. *TheCulturalHeritageofIndia.Kolkata:RamakrishnaMissionInstituteofCulture.*
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11. *Mahadevan,T.M.P.InvitationstoIndianPhilosophy.Madras:UniversityofMadras.*
12. *Hiriyanna,M.OutlinesofIndianPhilosophy.MotilalBanarsidass.*
13. *Tagore,Rabindranath.TheHistoryofBharatavarsha/OnNationalism/GreaterIndia.*
14. *Majumdar,R.C.et.al.AnAdvancedHistoryofIndia.Macmillan.*
15. *Mahajan,V.D.IndiaSince1526.NewDelhi:S.Chand&Company.*
16. *Durant,Will.TheCaseforIndia.Bangalore:StrandBookStall,2008.*
17. *Aurobindo,Sri.TheIndianRenaissance/India'sRebirth/OnNationalism.*
18. *Nivedita,Sister.TheWebofIndianLife.Kolkata:AdvaitaAshrama.*
19. *Durant, Will. The Story of Civilization. Volume 1 – Our Oriental Heritage. New York: Simon &Schuster.*
20. *Ranganathananda,Swami.EternalValuesforAChangingSociety.Bombay:BharatiyaVidyaBhavan.*
21. *Ranganathananda,Swami.UniversalMessageoftheBhagavadGita.Kolkata:AdvaitaAshrama.*
22. *Seturaman,V.S.IndianAesthetics.Macmillan.*
23. *Coomaraswamy,AnandaK.TheDanceofShiva.NewDelhi:SagarPublications.*
24. *Coomaraswamy,AnandaK.EssaysonIndianIdealism.NewDelhi:MunshiramManoharlal.*
25. *Danino,Michel.TheInvasionThatNeverWas.*
26. *Kautilya.Arthasastra.*
27. *Altekar,A.S.StateandGovernmentinAncientIndia.NewDelhi:MotilalBanarsidass.*
28. *Altekar,A.S.ThePositionofWomeninHinduCivilization.NewDelhi:MotilalBanarsidass.*
29. *Sircar, D. C. Studies in the Religious Life of Ancient and Medieval India. New Delhi: Motilal Banarsidass.*
30. *Sircar, D. C. Studies in the Political and Administrative Systems in Ancient and Medieval Times.NewDelhi: Motilal Banarsidass.*
31. *Madhavananda, Swami & R. C. Majumdar eds. The Great Women of India. Kolkata: Advaita Ashrama.*
32. *Dutt,R.C.TheEconomicHistoryofIndia.London,1902.*
33. *Dharampal.CollectedWorks.*
34. *Dharampal.ArchivalCompilations(unpublished)*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM233	GLIMPSESOFINDIANECONOMYANDPOLITY	L-T-P-C:2-0-0-2

Syllabus

Unit 1

Introduction

GeneralIntroduction; Primitive man and his modes of exchange – barter system; Prehistoric and proto-historicpolity and social organization.

AncientIndia–upto600B.C.

EarlyIndia–thevedicsociety–thevarnashramadharma–socio-politicalstructureofthevariousinstitutions based on the four purusarthas; The structure of ancient Indian polity – Rajamandala and Cakravartins – Prajamandala;Socio-economic elements from the two great Epics – Ramayana and Mahabharata – the conceptoftheidealKing(SriRama)andtheidealstate(Ramarajya)–Yudhisthira'sramarajya;Sarasvati - Sindhu civilization and India'strade links with other ancient civilizations; Towards chiefdoms and kingdoms–transformationofthepolity:kingship–fromgopatitobhupati;Themahajanapadasandthe emergence of the srenis – states and cities of theIndo-Gangetic plain.

Unit2

ClassicalIndia:600B.C.–1200A.D.

The rise of Magadha, emergence of new religions – Buddhism and Jainism – and the resultant socio-economic impact; The emergence of the empire – the Mauryan Economy and Kautilya's Arthasastra; of Politicsandtrade–theriseoftheMercantileCommunity;ElementsfromtheageoftheKushanasand theGreatGuptas;India's maritimetrade;DharmaatthebedrockofIndianpolity–theconceptofDigvijaya: dharma-vijaya, lobha-vijaya and asura-vijaya; Glimpses into the south Indian economies: political economiesofthepeninsula–Chalukyas,RashtrakutasandCholas

MedievalIndia:1200A.D.–1720A.D.

Advent of Islam – changes in the social institutions; Medieval India – agrarian economy, non-agricultural productionandurbaneconomy,currencysystem;Vijayanagarasamrajyaandmaritimetrade–thestory of Indian supremacyin the Indian Ocean region; Aspects of Mughal administration and economy; The Maratha and other provincial economies.

Unit3

ModernIndia:1720-1947

the Indian market and economy before the arrival of the European traders; Colonisation and British supremacy (dismantling of everything that was 'traditional' or 'Indian') – British attitude towards Indian trade,commerceandeconomyandtheresultantruiningofIndianeconomyandbusiness–man-madefamines – thesignsofrenaissance:banking and other business undertakings by the natives (the members of the early Tagore family, the merchants ofSurat and Porbander, businessmen ofBombay, etc. may be referredto here) – the evolution of the modern bankingsystem; Glimpses into British administration of India and administrative models; The National movement and nationalist undertakings in business and industry: the Tatas and the Birlas; Modern India: the growth of large- scale industry – irrigation and railways – money and credit – foreign trade; Towards partition – birth of two new nations – division of property; The writing of the Indian Constitution – India becomes a democratic republic – a new polity is in place.

IndependentIndia–from1947
IndiasinceIndependence–thesagaofsocio-politicalmovements;IndianeconomysinceIndependence–the fiscal system – the five year plans – liberalisation – the GATT and after; Globalisation and Indianeconomy; Impact ofscience and (new/ emerging) technology on Indian economy; Histories of select Indian business houses and business entrepreneurship.
Conclusion

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1. *The Cultural Heritage of India. Kolkata: Ramakrishna Mission Institute of Culture. Kautilya. Arthasastra.*
2. *Altekar,A.S.StateandGovernmentinAncientIndia.NewDelhi:MotilalBanarsidass.*
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6. *Dharampal.ArchivalCompilations(unpublished).*
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8. *Bajaj,Jitendra&M.D.Srinivas.TimelessIndia,ResurgentIndia.Chennai:CentreforPolicyStudies.*
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10. *Tripathi, Dwijendra. The Oxford History of Indian Business. New Delhi: Oxford University Press, 2004.*
11. *McGuire,John,etal,eds.EvolutionofWorldEconomy,PreciousMetalsandIndia.New Delhi: OxfordUniversity Press, 2001.*
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13. *Kudaisya,MedhaM.TheLifeandTimesofG.D.Birla.NewDelhi:OxfordUniversityPress,2003.*
14. *Raychaudhuri,TapanandIrfanHaib,eds.TheCambridgeEconomicHistoryofIndia.Volume*
15. *NewDelhi:OrientLongman,2004.*
16. *Kumar, Dharma, ed. The Cambridge Economic History of India. Volume 2. New Delhi: OrientLongman,2005.*
17. *Sabavala,S.A.andR.M.Lala,eds.J.R.D.Tata:Keynote.NewDelhi:Rupa&Co.,2004.*
18. *Mambro,Arvinded.J.R.D.Tata:Letters.NewDelhi:Rupa&Co.,2004.*
19. *Lala,R.M.,FortheLoveofIndia:TheLifeandTimesofJamsetjiTata.NewDelhi:Penguin,2006.*
20. *Thapar, Romila. The Penguin History of Early India: From the Origins to AD 1300. New DelhiPenguin,2002.*
21. *Majumdar,R.C.,et.al.AnAdvancedHistoryofIndia.Macmillan.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM234	HEALTHANDLIFESTYLE	L-T-P-C:2-0-0-2

Syllabus

Unit 1

IntroductiontoHealth
Health is wealth; Role of lifestyle habits on health; Importance of adolescence; Stages, Characteristics and changes during adolescence; Nutritional needs during adolescence why healthy lifestyle is important for adolescence.EatingHabits-eatingdisorders,skippingbreakfast,junkfoodconsumption.

Practicals-TherapeuticDiets

Unit2

FoodandNutritionalRequirementsduringAdolescence
Fluid intake; nutrition related problems; lifestyle related problems, Role of physical activity; resting pattern andpostures,Personalhabits–alcoholism,andothertobaccoproducts, electronicaddictionetc

Practicals-EthnicFoods

Unit3

NeedforaPositiveLifeStyleChange
Peerpressure&procrastination,Stress,depression,suicidaltendency,Miniproject reviewandviva,Whole portions revision.

Practical-CookingwithoutFireorWire-healthySnacks

TEXTBOOKS:

1. *B.Srilakshmi,"Dietetics",Newageinternational(P)ltd,publishers,2010.*
2. *"Nutrient requirement and Recommended Dietary Allowances for Indians", published by Indian Councilof Medical Research, ICMR, 2010.*

REFERENCEBOOKS:

1. *KPark"Textbookofpreventiveandsocialmedicine",2010.*
2. *WHOReportonAdolescentHealth:2010*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM235	INDIANCLASSICSFORTHETWENTY-FIRSTCENTURY	L-T-P-C:2-0-0-2

Syllabus

Unit 1
IntroductorystudyoftheBhagavadGitaandtheUpanishads.

Unit2
Therelevanceoftheseclassicsinamodernage.

Unit3
Goalsofhumanlife-existentialproblemsandtheirsolutionsinthelightoftheseclassicsetc.

REFERENCE:
TheBhagavadGita,CommentarybySwamiChinmayananda

EvaluationPattern

Assessment	**Internal**	**End Semester**
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM236	INTRODUCTIONTOINDIASTUDIES	L-T-P-C:2-0-0-2

PREAMBLE:

This paper will introduce the students to the multiple dimensions of the contribution of India to the fields of philosophy,art,literature,physicalandsocialsciences.Thepaperintendstogiveaninsightto thestudentsaboutthefar-reachingcontributionsofIndiatoworldcultureandthoughtduringthecourse of its long journey from thehoary antiquity to the present times. Every nation takes pride in its achievements and it is this sense of pride andreverence towards the achievements that lays the foundation for its all-round progress.

SyllabusUnit

1
AbriefoutlineofIndianhistoryfromprehistorictimestothepresenttimes.

Contributions of India to world culture and civilization: Indian Philosophy and Religion; Art and Literature; Physical and Social Sciences.

Unit2
ModernIndia:ChallengesandPossibilities.

Scientific and technological progress in post-independence era; Socio-cultural and political movements after independence; Challenges before the nation today - unemployment – corruption – degradation of cultural andmoral values - creationof anewsystemofeducation; Creationof a modernandvibrant society rooted in traditional values.

Unit3
ModernIndianWritinginEnglish:TrendsinContemporaryIndianLiteratureinEnglish.

TEXTBOOK:
MaterialgivenbytheFaculty

BACKGROUNDLITERATURE:

1. *Selections from The Cultural Heritage of India, 6 volumes, Ramakrishna Mission Institute of Culture(Kolkata) publication.*
2. *SelectionsfromtheCompleteWorksofSwamiVivekananda,AdvaitaAshramapublication.*
3. *InvitationstoIndianPhilosophy,T.M.P.Mahadevan,UniversityofMadras,Chennai.*
4. *OutlinesofIndianPhilosophy,M.Hiriyanna,MLBD.*
5. *AnAdvancedHistoryofIndia,R.C.Majumdaretal,Macmillan.*
6. *IndiaSince1526,V.D.Mahajan,S.Chand&Company*
7. *TheIndianRenaissance,SriAurobindo.*
8. *India'sRebirth,SriAurobindo.*
9. *OnNationalism,SriAurobindo.*
10. *The Story of Civilization, Volume I: Our Oriental Heritage, Will Durant, Simonand Schuster, New York.*

11. *EternalValuesforaChangingSociety,SwamiRanganathananda,BharatiyaVidyaBhavan.*
12. *UniversalMessageoftheBhagavadGita,SwamiRanganathananda,AdvaitaAshrama.*
13. *AwakenChildren:ConversationswithMataAmritanandamayi*
14. *IndianAesthetics,V.S.Seturaman,Macmillan.*
15. *IndianPhilosophyofBeauty,T.P.Ramachandran,UniversityofMadras,Chennai.*
16. *WebofIndianThought,SisterNivedita*
17. *EssaysonIndianNationalism,AnandKumaraswamy*
18. *ComparativeAesthetics,Volume2,KantiChandraPandey,Chowkhamba,Varanasi*
19. *TheInvasionThatNeverWas,MichelDanino*
20. *Samskara,U.R.Ananthamurthy,OUP.*
21. *Hayavadana,GirishKarnard, OUP.*
22. *Naga-Mandala,GirishKarnard, OUP.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM237	INTRODUCTIONTOSANSKRITLANGUAGEANDLITERATURE	L-T-P-C:2-0-0-2

OBJECTIVES:

To familiarize students with Sanskrit language; to introduce students to various knowledge traditions in Sanskrit;to help students appreciate and imbibe India's ancient culture and values.

SyllabusUnit

1
Sanskrit Language – Vakya Vyavahara(प्रथमादीक्षा)- Introduction to Sanskrit language - Devanagari script and Sanskrit alphabet - Vowels and Consonants – Pronunciation - Classification of Consonants – SamyukthaksharaWords–Nounsand Verbs -Cases– IntroductiontoNumbersand Time– Verbs: Singular,Dualand Plural–SarvaNamas:FirstPerson,SecondPerson,ThirdPerson–Tenses:Past, PresentandFuture-WordsforCommunication–SelectedSlokas–MoralStories–Subhashithas– Riddles.

Unit2
LanguageStudies-RoleofSanskritinIndian&WorldLanguages.

Unit3
Introduction to Sanskrit Classical Literature – KavyaTradition – Drama Tradition - Stotra Tradition – Panchatantra Stories.

Unit4
Introduction to Sanskrit Technical Literature – Astronomy – Physics – Chemistry – Botany – Engineering–Aeronautics – Ayurveda – Mathematics – Medicine – Architecture - Tradition of Indian Art – Administration –Agriculture.

Unit5
IndologyStudies–PerspectivesandInnovations.

TEXTBOOKSANDREFERENCEBOOKS:

1. *VakyaVyavahara-Prof.VempatyKutumbaSastri,RashtriyaSanskritSansthan,NewDelhi*
2. *TheWonderthatisSanskrit-Dr.SampadanandaMishra,NewDelhi*
3. *ScienceinSanskrit–SamskrithaBharathi,NewDelhi*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM238	NATIONALSERVICESCHEME	L-T-P-C:2-0-0-2

Syllabus

Unit 1
Introduction to Basic Concepts of NSS: History, philosophy, aims and objectives of NSS, Emblem, flag, motto,song, badge etc., Organisational structure, roles and responsibilities of various NSS functionaries.
NSS Programmes and Activities: Concept of regular activities, special campaigning, Day Camps, Basisof adoptionofvillage/slums,methodologyofconductingsurvey,financialpatternofthe scheme, other youthprogramme/schemes of GOI, Coordination with different agencies, Maintenance of the Diary.

Unit2
Volunteerism and Shramdan: Indian Tradition of volunteerism, Needs andimportance ofvolunteerism, Motivation and Constraints of volunteerism, Shramdan as part of volunteerism, Amalabharatam Campaign, Swatch Bharath.

Unit3
Understanding youth: Definition, profile and categories of youth, Issues, challenges and opportunities for youth, Youth as an agent of social change.
Youth and Yoga: History, philosophy and concept of Yoga, Myths and misconceptions about Yoga, DifferentYoga traditions and their impacts, Yoga as a preventive and curative method, Yoga as a tool for healthy life style

Unit4
Youth Development Programmes in India: National Youth Policy, Youth development programmes at the nationallevel,statelevelandvoluntarysector,youth-focusedandyouth-ledorganizations.
Youth and Crime: Sociological and psychological factors influencing youth crime, Peer mentoring in preventingcrimes,AwarenessaboutAnti-Ragging,CyberCrimeanditsprevention,JuvenileJustice.

Unit5
Environmental Issues: Environment conservation, enrichment and sustainability, climate change, waste management,rainwaterharvesting,energyconservation,wastelanddevelopment.

ProjectWork/Practical

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM239	PSYCHOLOGYFOREFFECTIVELIVING	L-T-P-C:2-0-0-2

CourseObjectives

1. Tohelpstudentsacquirethebasicknowledgeofbehaviorandeffectiveliving
2. Tocreateanawarenessofthehazardsofhealthcompromisingbehaviours
3. Todevelopandstrengthenthetoolsrequiredtohandletheadversitiesoflife

CourseOutcome

CO 1: Understand the basic concepts of Behavioral
PsychologyCO 2: Demonstrate self reflective skills through
activities
CO3:Applytheknowledgeofpsychologytorelievestress
CO4:Analysetheadverseeffectsofhealthcompromisingbehaviours.
CO5:Evaluateanduseguidedtechniquestoovercomeandcopewithstressrelatedproblems.

CO-POMapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						1						1
CO2						2	3		3	3		
CO3						3	3	2	1		3	2
CO4						2	2	3				1
CO5						1	2				1	1

Syllabus

Unit 1

Self-Awareness&Self-Motivation
Self analysis through SWOT, Johari Window, Maslow's hierarchy of motivation, importance of self esteem andenhancement of self esteem.

Unit2

TheNatureandCopingofStress
Conflict, Relationship issues, PTSD. Stress – stressors – eustress - distress, coping with stress, stress managementtechniques.

Unit3

ApplicationofHealthPsychology
Healthcompromisingbehaviours,substanceabuseandaddiction.

TEXTBOOKS:

1. *V.D.Swaminathan&K.V.Kaliappan"Psychologyforeffectiveliving-AnintroductiontoHealth*
2. *Psychology.2ndeditionRobertJ.Gatchel,AndrewBaum&DavidS.Krantz,McGrawHill.*

REFERENCEBOOKS:

1. *S.Sunder,'TextbookofRehabilitation',2ndedition,JaypeeBrothers,NewDelhi.2002.*
2. *Weiben&Lloyd,'PsychologyappliedtoModernLife',ThompsonLearning,AsiaLtd.2004.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM240	PSYCHOLOGYFORENGINEERS	L-T-P-C:2-0-0-2

CourseObjectives:

1. Tostrengthenthefundamentalknowledgeofhumanbehavior
2. To strengthen the ability to understand the basic nature and behavior of humans in organizations as awhole
3. Toconnecttheconceptsofpsychologytopersonalandprofessionallife

CourseOutcome

CO 1: Understand the fundamental processes underlying human behavior such as learning,motivation,individual differences, intelligence and personality.
CO 2: Apply the principles of psychology in day- to- day life for a better understanding of oneself and others.CO 3: ApplytheknowledgeofPsychologytoimprovestudyskillsand learning methods
CO 4: Apply the concepts of defense mechanisms to safeguard against abusive relationships and to nurturehealthy relationships.

CO-POMapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3	3		3	2		1
CO2						3	3	2	3	3	1	2
CO3										2	1	
CO4							3		2	2		2

Syllabus

Unit 1
PsychologyofAdolescents:Adolescenceanditscharacteristics.

Unit2
Learning, Memory & Study Skills: Definitions, types, principles of reinforcement, techniques for improving study skills, Mnemonics.

Unit3
Attention&Perception:Definition,typesofattention,perception.

TEXTBOOKS:

1. *S.K.Mangal,"General Psychology",SterlingPublishersPvt.Ltd.2007*
2. *BaronA.Robert,"Psychology",PrenticeHallofIndia.NewDelhi2001*

REFERENCEBOOKS:

1. *ElizabethB.Hurlock,DevelopmentalPsychology-Alifespanapproach,6thedition.*
2. *Feldman,UnderstandingPsychology,McGrawHill,2000.*
3. *Clifford Morgan, Richard King, John Scholper, "Introduction to Psychology", Tata Mcgraw Hill, PvtLtd 2004.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM241	SCIENCEANDSOCIETY-ANINDIANPERSPECTIVE	L-T-P-C:2-0-0-2

Syllabus

Unit 1
Introduction
WesternandIndianviewsofscienceandtechnology
Introduction; Francis Bacon: the first philosopher of modern science; The Indian tradition in science and technology: an overview.

Unit2
Indiansciences
Introduction; Ancient Indian medicine: towards an unbiased perspective; Indian approach to logic; The methodology of Indian mathematics; Revision of the traditional Indian planetary model by Nilakantha Somasutvan in circa 1500 AD

ScienceandtechnologyundertheBritishrule
Introduction; Indian agriculture before modernization;The story ofmodern forestry in India; The building ofNew Delhi

Unit3
ScienceandtechnologyinIndependentIndia
Introduction;Anassessmentoftraditionalandmodernenergyresources;Greenrevolution:a historicalperspective; Impact of modernisation on milk and oilseeds economy; Planning without the spirit and thedetermination.

BuildingupontheIndiantradition
Introduction; Regeneration of Indian national resources; Annamahatmyam and Annam Bahu Kurvita: recollecting theclassical Indiandisciplineofgrowingandsharingfoodinplentyand regenerationof Indian agriculture toensure food forallin plenty.

Conclusion

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1. *Joseph, George Gheverghese. The Crest of the Peacock: Non-European Roots of Mathematics. London:Penguin (UK), 2003.*
2. *Iyengar,C.N.Srinivasa.HistoryofHinduMathematics.Lahore:1935,1938(2Parts).*
3. *Amma, T. A. Saraswati. Geometry in Ancient and Medieval India. Varanasi: Motilal Banarsidass, 1979.*
4. *Bag,A.K.MathematicsinAncientandMedievalIndia.Varanasi:MotilalBanarsidass,1979.*
5. *SarmaK.V.&B.V.Subbarayappa.IndianAstronomy:ASource-Book.Bombay:NehruCentre,1985.*
6. *Sriram, M. S. et. al. eds. 500 Years of Tantrasangraha: A Landmark in the History of Astronomy. Shimla:Indian Institute of Advanced Study, 2002.*
7. *Bajaj, Jitendra & M. D. Srinivas. Restoring the Abundance: Regeneration of Indian AgriculturetoEnsure Food for All in Plenty.Shimla: Indian Institute of Advanced Study, 2001.*
8. *Bajaj,Jitendraed.ReportoftheSeminaronFoodforAll:TheClassicalIndian DisciplineofGrowingandSharingFoodinPlenty.Chennai:CentreforPolicyStudies, 2001.*

9. *Bajaj,Jitendra&M.D.Srinivas.AnnamBahuKurvita:RecollectingtheIndian DisciplineofGrowingandSharingFoodinPlenty.Madras:CentreforPolicyStudies, 1996.*
10. *Parameswaran,S.TheGoldenAgeofIndianMathematics.Kochi:SwadeshiScienceMovement.*
11. *Somayaji,D.A.ACriticalStudyofAncientHinduAstronomy.Dharwar:1972.*
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14. *Bose,D.M.et.al.AConciseHistoryofScienceinIndia.NewDelhi:1971.*
15. *Bajaj,Jitendra&M.D.Srinivas.IndianEconomyandPolity.Chennai:CentreforPolicyStudies.*
16. *Bajaj,Jitendra&M.D.Srinivas.TimelessIndia,ResurgentIndia.Chennai:CentreforPolicyStudies.*
17. *Joshi, Murli Manohar. Science, Sustainability and Indian National Resurgence. Chennai: Centre for Policy Studies, 2008.*
18. *TheCulturalHeritageofIndia.Kolkata:RamakrishnaMissionInstituteofCulture.*

** Thesyllabusandthestudymaterialinusehereinhasbeendevelopedoutofa'summer programme'offeredbytheCentreforPolicyStudies(CPS),ChennaiattheIndianInstituteof AdvancedStudy (IIAS),RashtrapatiNivas,Shimla, sometime ago. The same has been very kindly made available to us by Professors Dr M.D. Srinivas (Chairman) and Dr J.K. Bajaj (Director) of the CPS.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM242	THEMESSAGEOFBHAGWADGITA	L-T-P-C:2-0-0-2

Syllabus

Unit 1

Introduction:Relevance ofBhagavadGita today–BackgroundofMahabharatha.

ArjunaVishada Yoga: Arjuna's Anguish and Confusion – Symbolism of Arjuna's

Chariot.

Sankhya Yoga: Importance of Self-knowledge – Deathlessness: Indestructibility of Consciousness – Being Established in Wisdom – Qualitiesof a Sthita-prajna.

Unit2

Karma Yoga: Yoga of Action – Living in the Present – Dedicated Action without Anxiety over Results - Conceptof Swadharma.

DhyanaYoga:TuningtheMind–Quantity,QualityandDirectionofThoughts–ReachingInnerSilence.

Unit3

BhaktiYoga:YogaofDevotion–FormandFormlessAspectsoftheDivine–InnerQualitiesofaTrueDevotee.

GunatrayaVibhaga Yoga: Dynamics of the Three Gunas: Tamas, Rajas, Sattva – Going Beyond the Three Gunas –Description of a Gunatheetha.

TEXTBOOKS/REFERENCES:

1. *SwamiChinmayananda,"TheHolyGeeta",CentralChinmayaMissionTrust,2002.*
2. *SwamiChinmayananda,"AManualofSelfUnfoldment",CentralChinmayaMissionTrust,2001.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM243	THEMESSAGEOFTHEUPANISHADS	L-T-P-C:2-0-0-2

OBJECTIVES:

To give students an introduction to the basic ideas contained in the Upanishads; and explores how their messagecan be applied in daily life for achieving excellence.

SyllabusUnit

1
AnIntroductiontothePrincipalUpanishadsandtheBhagavadGita-Inquiryintothemysteryofnature-Sruti versusSmrti-SanatanaDharma:itsuniqueness-TheUpanishadsandIndianCulture-Upanishadsand ModernScience.

Unit2
Thechallengeofhumanexperience&problemsdiscussedintheUpanishads–theTruenatureofMan–theMoving power oftheSpirit –TheMessageofFearlessness –UniversalMan- Thecentralproblems of theUpanishads – Ultimate reality –thenatureof Atman-thedifferent manifestations of consciousness.

Unit3
UpanishadPersonalities-episodesfromtheirlivesandessentialteachings:Yajnavalkya,Aruni, Uddalaka, Pippalada,Satyakama Jabala, Svetaketu, Nachiketas, Upakosala, Chakrayana Ushasti, Raikva, KapilaandJanaka. Importantverses fromUpanishads-DiscussionofSage Pippalada'sanswerstothe six questions in Prasnopanishad.

REFERENCES:

1. *TheMessageoftheUpanishadsbySwamiRanganathananda,BharatiyaVidyaBhavan*
2. *EightUpanishadswiththecommentaryofSankaracharya,AdvaitaAshrama*
3. *IndianPhilosophybyDr.S.Radhakrishnan,OxfordUniversityPress*
4. *EssentialsofUpanishadsbyRLKashyap,SAKSI,Bangalore*
5. *UpanishadsinDailyLife,SriRamakrishnaMath,Mylapore.*
6. *EternalstoriesoftheUpanishadsbyThomasEgenesandKumudaReddy*
7. *UpanishadGangaseries–ChinmayaCreations*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23HUM244	UNDERSTANDINGSCIENCEOFFOODANDNUTRITION	L-T-P-C:2-0-0-2

CourseObjectives:

- To introduce the significance of food, nutrients, locally available food resources, synergic foodcombinations,goodcookingmethodsandimportanceofdiversity in foods
- Tounderstandnutritionalimbalancesandchronicdiseasesassociatedwiththequalityoffood.
- To gain awareness about the quality of food - Organic food, genetically modified food, adulterated food,allergic food, , food poisoning and food safety.
- Tounderstandfoodpreservationprocessing,packagingandtheuseofadditives.

CourseOutcome:

CO1:Acquireknowledgeaboutthevariousfoodandfoodgroups
CO2: Understand nutritional imbalances and chronic diseases prevailing among different age groups.CO3:Understandthesignificanceofsafefoodandapplythefoodsafetystandards
CO4: Demonstrate skills of food processing, preservation and packaging methods with or without additives CO5: Evaluate the quality of food based on the theoretical knowledge of Food andNutrition

CO-POMapping:

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1	1			1	2	1	1	1	1	3
CO2		1	1			1	1	1	1	1	1	3
CO3		1	1			1	1	1	1	1	1	3
CO4		1	1			1	1	1	1	1	1	3
CO5		1	1			1	2	1	2	1	1	3

Syllabus

Unit 1

Food andFoodGroups
Introduction to foods, food groups, locally available foods, Nutrients, Cooking methods, Synergy between foods,Sciencebehindfoods,Foodallergies,foodpoisoning,foodsafetystandards.

CookeryPracticals-BalancedDiet

Unit2

NutrientsandNutrition
Nutrition through life cycle, RDA, Nutrition in disease, Adulteration of foods & Food additives, Packaging and labeling of foods.

Practicals-TraditionalFoods

Unit3

IntroductiontoFoodBiotechnology

Futurefoods-Organicfoodsandgeneticallymodifiedfoods,Fortificationoffoodsvalueadditionof foods, functional foods, Nutraceuticals, supplementary foods, Processing and preservation of foods, applicationsof food technology in daily life, and your prospects associated with food industry – Nanoparticles, biosensors, advancedresearch.

Practicals-Valueaddedfoods

TEXTBOOKS:

1. *N. Shakuntalamanay, M. Shadaksharaswamy, "Food Facts and principles", New age international (P)ltd, publishers, 2005.*
2. *B.Srilakshmi,"Dietetics",Newageinternational(P)ltd,publishers,2010.*

REFERENCEBOOKS:

1. *B.Srilakshmi,"FoodScience",Newageinternational(P)ltd,publishers,2008.*
2. *"Nutrient requirement and Recommended Dietary Allowances for Indians", published by Indian Councilof Medical Research, ICMR, 2010.*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23JAP230	PROFICIENCYINJAPANESELANGUAGE(LOWER)	L-T-P-C:2-0-0-2

Syllabus

ThispaperwillintroducethebasicsofJapaneselanguage.Studentswillbetaughtthelanguage through variousactivities like writing, reading, singing songs, showing Japanese movies etc. Moreover thispaperintendstogivea thorough knowledge on Japanese scripts that is Hiragana and Katakana. Classes will be conducted throughoutin Japanese class only. Students will be able to make conversationswitheachotherinJapanese.Studentscan makeself-introductionand willbeableto write letters in Japanese. All the students will be given a text on Japaneseverbs and tenses.

StudentscanknowabouttheJapaneseculture andthelifestyle.Calligraphyisalsoapartofthispaper. Informalsessions will be conducted occasionally, in which students can sing Japanese songs, watch Japanese movies, doOrigami – pattern making using paper.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.

23JAP231	PROFICIENCYINJAPANESELANGUAGE(HIGHER)	L-T-P-C:2-0-0-2

Syllabus

Students will be taught the third and the most commonly used Japanese script, Kanji. Students will be taught towrite as well as speak.

StudentswillbegivendetailedlecturesonCalligraphy.

This version of the course includes a new project where the studentsshould make a short movie in Japaneselanguage selecting their own topics.

Bytheendofthesemestertheythestudentswillmasterthesubjectinallmeans.Theywillbeableto speak JapaneseasfluentlyastheyspeakEnglish.Studentswillbeencouragedtowritestoriesand songsin Japaneselanguage themselves.

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment (CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports

23SWK230	CORPORATESOCIALRESPONSIBILITY	L-T-P-C:2-0-0-2

Syllabus

Unit 1

Understanding CSR - Evolution, importance, relevance and justification. CSR in the Indian context, corporate strategy. CSR and Indian corporate. Structure of CSR - Inthe Companies Act 2013 (Section 135); Rules underSection13; CSRactivities,CSRcommittees,CSRpolicy,CSR expenditureCSR reporting.

Unit2

CSR Practices & Policies - CSR practices in domestic and international area;Role and contributions of voluntaryorganizations to CSR initiatives. Policies; Preparation of CSR policy and process of policy formulation; Government expectations, roles and responsibilities. Role of implementation agency in Section 135 of the Companies Act, 2013. Effective CSR implementation.

Unit3

ProjectManagementinCSRinitiatives-Projectandprogramme;MonitoringandevaluationofCSR Interventions. Reporting - CSR Documentation and report writing. Reporting framework, format and procedure.

REFERENCES:

1. *Corporate Governance, Ethics and Social Responsibility, V Bala Chandran and V Chandrasekaran,PHIlearning Private Limited, New Delhi 2011.*
2. *White H. (2005) Challenges in evaluating development effectiveness: Working paper 242, Institute of Development Studies, Brighton.*
3. *UNDP(nd)Governanceindicators:Ausersguide.Oslo:UNDP*
4. *Rao, Subbha (1996) Essentials of Human Resource Management and Industrial Relations, Mumbai,Himalaya*
5. *Rao,V.S.L.(2009)HumanResourceManagement,NewDelhi,ExcelBooks,*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment(CA)	20	
EndSemester		50

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23SWK231	WORKPLACEMENTALHEALTH	L-T-P-C:2-0-0-2

Syllabus

Unit 1

Mental Health – concepts, definition, Bio-psycho-social model of mental health. Mental health and mental illness,characteristicsofamentallyhealthyindividual,Signsandsymptomsofmentalhealthissues, presentationofamentallyillperson.Workplace–definition,concept,prevalenceofmentalhealthissuesin the work place, whyinvest in workplace mental health, relationship between mental health and productivity, organizationalculture and mental health. Case Study, Activity.

Unit2

MentalHealthIssuesintheWorkplace:Emotions,Commonemotionsattheworkplace,MentalHealthissues - Anger,Anxiety,Stress&Burnout,Depression,Addictions–SubstanceandBehavioural,PsychoticDisorders - Schizophrenia,BipolarDisorder,Personalitydisorders.CrisisSituations-Suicidalbehavior,panicattacks, reactions to traumatic events. Stigma and exclusion of affected employees. Other issues –work-life balance, Presenteeism,Harassment,Bullying,Mobbing.MentalHealthFirstAid-Meaning.CaseStudy,Activity.

Unit3

Strategies of Help and Care: Positive impact of work on health, Characteristics of mentally healthy workplace,Employeeandemployerobligations,Promotingmentalhealthandwellbeing-corporatesocialresponsibility (CSR), an inclusive work environment, Training and awareness raising, managing performance, inclusive recruitment, Supporting individuals-talking about mental health, making reasonable adjustments, Resources and support for employees - Employee Assistance Programme / Provider (EAP), in house counsellor, medical practitioners, online resources and telephone support, 24 hour crisis support, assistance for colleagues and caregivers, Legislations. Case Study, Activity.

REFERENCES:

1. *American Psychiatric Association. "Diagnostic and statistical manual of mental disorders: DSM-IV4thed."www.terapiacognitiva.eu/dwl/dsm5/DSM-IV.pdf*
2. *AmericanPsychiatricAssociation. (2000) www.ccsa.ca/Eng/KnowledgeCentre/OurDatabases/ Glossary/Pages/index.aspx.*
3. *Canadian Mental Health Association, Ontario "Workplace mental health promotion, A how toguide" wmhp.cmhaontario.ca/*
4. *Alberta Health Services Mental Health Promotion. (2012). Minding the Workplace: Tips for employeesand managers together. Calgary: Alberta Health Services.http://www.mentalhealthpromotion.net/resources/minding-the-workplace-tips-for-employees-and-managers- together.pdf*
5. *Government of Western Australia, Mental Health Commission. (2014) "Supporting good mentalhealth in the work place."http://www.mentalhealth.wa.gov.au/Libraries/pdf_docs/supporting_good_mental_health_in_the_workplace_1.sflb.ashx*
6. *MentalHealthAct1987(India)www.tnhealth.org/mha.htm*
7. *PersonswithdisabilitiesAct1995(India)socialjustice.nic.in*
8. *TheFactoriesAct1948(India)www.caaa.in/Image/19ulabourlawshb.pdf*

EvaluationPattern

Assessment	Internal	EndSemester
Periodical1(P1)	15	
Periodical2(P2)	15	
*ContinuousAssessment(CA)	20	
EndSemester		50

*CA–CanbeQuizzes,Assignment,Projects,andReports.