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| **M.Sc.,****home sciencE – FOOD SERVICE MANAGEMENT & dIETETICS** |
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| **SYLLABUS** |
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| **FROM THE ACADEMIC YEAR**  **2023 - 2024** |
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| **TAMILNADU STATE COUNCIL FOR HIGHER EDUCATION, CHENNAI – 600 005** |
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**OUTLINEOFTHECURRICULUMANDTEMPLATEFORCOURSESYLLABUS**

# IntroductiontotheProgramme

1. **HighlightsoftheProgramme**

# ProgrammeOutcomes(PO)of PGDegree Programme

1. **ProgrammeSpecificOutcomes(PSO)of PGDegreeProgramme**

# TeachingMethodologies

1. **TemplateForCurriculumDesignforPGDegree Programme**

# CreditDistributionforPGProgramme

1. **ConsolidatedSemesterWise andComponentWiseCreditDistribution**

# Methodsof Evaluation

**Template for P.G., Programmes**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Semester–I** | **Credit** | **Hours** | **Semester-II** | **Credit** | **Hours** | **Semester-III** | **Credit** | **Hours** | **Semester–IV** | **Credit** | **Hours** |
| 1.1. Core-I  | 5 | 7 | 2.1. Core-IV  | 5 | 6 | 3.1. Core-VII | 5 | 6 | 4.1. Core-XI  | 5 | 6 |
| 1.2 Core-II  | 5 | 7 | 2.2 Core-V  | 5 | 6 | 3.2 Core-VIII  | 5 | 6 | 4.2 Core-XII | 5 | 6 |
| 1.3 Core – III  | 4 | 6 | 2.3 Core – VI | 4 | 6 | 3.3 Core – IX | 5 | 6 | 4.3 Project with viva voce | 7 | 10 |
| 1.4 Discipline Centric Elective -I | 3 | 5 | 2.4 Discipline Centric Elective – III | 3 | 4 | 3.4 Core – X  | 4 | 6 | 4.4Elective - VI (Industry / Entrepreneurship) 20% Theory80% Practical  | 3 | 4 |
| 1.5 Generic Elective-II:  | 3 | 5 | 2.5 Generic Elective -IV:  | 3 | 4 | 3.5 Discipline Centric Elective - V  | 3 | 3 | 4.5 Skill Enhancement course / Professional Competency Skill  | 2 | 4 |
|  |  |  | 2.6 NME I | 2 | 4 | 3.6 NME II | 2 | 3 | 4.6 Extension Activity | 1 |  |
|  |  |  |  |  |  | 3.7 Internship/ Industrial Activity | 2 | - |  |  |  |
|  | **20** | **30** |  | **22** | **30** |  | **26** | **30** |  | **23** | **30** |
| **Total Credit Points -91** |

**Choice Based Credit System (CBCS), Learning Outcomes Based Curriculum Framework (LOCF) Guideline Based Credits and Hours Distribution System**

**for all Post – Graduate Courses including Lab Hours**

**First Year – Semester – I**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **List of Courses** | **Credits** | **No. of Hours** |
|  | Core – I | 5 | 7 |
| Core – II | 5 | 7 |
| Core – III | 4 | 6 |
| Elective – I | 3 | 5 |
| Elective – II | 3 | 5 |
|  |  | **20** | **30** |

**Semester-II**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **List of Courses** | **Credits** | **No. of Hours** |
|  | Core – IV | 5 | 6 |
| Core – V | 5 | 6 |
| Core – VI | 4 | 6 |
| Elective – III | 3 | 4 |
| Elective – IV | 3 | 4 |
| Skill Enhancement Course [SEC] - I | 2 | 4 |
|  |  | **22** | **30** |

**Second Year – Semester – III**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **List of Courses** | **Credits** | **No. of Hours** |
|  | Core – VII | 5 | 6 |
| Core – VIII | 5 | 6 |
| Core – IX | 5 | 6 |
| Core (Industry Module) – X | 4 | 6 |
| Elective – V | 3 | 3 |
| Skill Enhancement Course - II | 2 | 3 |
|  | Internship / Industrial Activity [Credits] | 2 | - |
|  |  | **26** | **30** |

**Semester-IV**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **List of Courses** | **Credits** | **No. of Hours** |
|  | Core – XI | 5 | 6 |
| Core – XII | 5 | 6 |
| Project with VIVA VOCE | 7 | 10 |
| Elective – VI (Industry Entrepreneurship)  | 3 | 4 |
| Skill Enhancement Course – III / Professional Competency Skill | 2 | 4 |
| Extension Activity | 1 | - |
|  |  | **23** | **30** |

**Total 91 Credits for PG Courses**

# INTRODUCTION

HomeScienceisbothmultidisciplinaryandinterdisciplinaryinitscontextencompassingfivemajordisciplineswhichincludesFoodsandNutrition,Nutrition, Food Service Management & Dietetics, Clinical Nutrition & Dietetics, Food Science Technology and Nutrition Nutrition & Dietetics with hospitality management, Hospital Administration, Food Service Management, Food Processing.Each areahasoneormorespecificareasofspecialization.EachspecializationunderHomeScienceoffersawidearrayof courses thatprepares studentsforemployment orsettingupanenterpriseinawiderangeofsectorssuchashealthcare,childcare,foodandhospitality,textiles, home and office interiors.Further, all courses of the programme are designed toimprove the lifestyle ofthe individual, family and society that couldmost certainlycontributeto theholisticdevelopment of the community.

Thecoursecurriculumforthisprogrammehasbeenplannedtoimprovetheemployability potential and increase the scope for higher education. Globalization hascreatedamarketforjobswithdifferentskillsintheareasoffoodandhealthcareindustriesand can thus contribute to the professional growth of students enrolled in this programme.This programme facilitates action-based research in the various fields with the advantageofnurturingcriticalandanalyticalthinkingthatpavethewayforinnovationandentrepreneurship.

Nutrition professionals are in high demand due to the fast-paced lifestyle, and anincreasing incidence of lifestyle related disorders affecting all sections of the population.Withgrowingawarenesstoleadhealthierlifestyles,coursesrelatingtofoodsandnutritioncan provide the framework for developing skills and knowledge to become a well-trainedNutritional professional. The programme can also contribute in designing community-based interventions for a healthier society.For a Home maker, this programme will givean insight into the management of different resources on a day to day basis, and keepingabreastwith thechallengesposed bymodern dayliving.

# TEACHINGMETHODOLOGIES

**Teaching methods :** Chalk and Board, Experiential learning, Student centric learning and Smallprojects and Practical assignments; Virtual Classroom, LCDprojector, Smart Class, VideoConferenceand GuestLecturesbyeminent people.

# Training students to engage in self-study without relying on faculty (for example – libraryandinternet search,manualand handbook usage,etc.)

Library,NetSurfing,Manuals,NPTEL,NaanMudhalvanCoursesOtheruniversitywebsites.

|  |
| --- |
| **TANSCHE REGULATIONS ON LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK FOR POSTGRADUATE EDUCATION** |
| **Programme** | **M.Sc., Home Science,Food Service Management &Dietetics** |
| **Programme Code** |  |
| **Duration** | **2 years for PG** |
| **Programme Outcomes (Pos)** | **PO1: Problem Solving Skill**Apply knowledge of Management theories and Human Resource practices to solve business problems through research in Global context.**PO2: Decision Making Skill**Foster analytical and critical thinking abilities for data-based decision-making.**PO3: Ethical Value**Ability to incorporate quality, ethical and legal value-based perspectives to all organizational activities.**PO4: Communication Skill**Ability to develop communication, managerial and interpersonal skills.**PO5: Individual and Team Leadership Skill**Capability to lead themselves and the team to achieve organizational goals.**PO6: Employability Skill**Inculcate contemporary business practices to enhance employability skills in the competitive environment.**PO7: Entrepreneurial Skill**Equip with skills and competencies to become an entrepreneur.**PO8: Contribution to Society** Succeed in career endeavors and contribute significantly to society.**PO 9 Multicultural competence** Possess knowledge of the values and beliefs of multiple cultures and  a global perspective.**PO 10: Moral and ethical awareness/reasoning**Ability to embrace moral/ethical values in conducting one’s life.  |
| **Programme Specific Outcomes****(PSOs)** | **PSO1 – Placement**To prepare the students who will demonstrate respectful engagement with others’ ideas, behaviors, beliefs and apply diverse frames of reference to decisions and actions.**PSO 2 - Entrepreneur**To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate startups and high potential organizations.**PSO3 – Research and Development**Design and implement HR systems and practices grounded in research that comply with employment laws, leading the organization towards growth and development.**PSO4 – Contribution to Business World**To produce employable, ethical and innovative professionals to sustain in the dynamic business world.**PSO 5 – Contribution to the Society**To contribute to the development of the society by collaborating with stakeholders for mutual benefit. |

**SEMESTER - I**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course status** | **Course Title** | Credits | Hours |
| Core-1 | Food Service Management/ Institutional Food service Management | 5 | 7 |
| Core -2 | Food Science | 5 | 7 |
| Core-3 | Human Physiology | 4 | 6 |
| Elective - I  | Food Microbiology, Safety and Quality Control | 3 | 5 |
| Elective - II | Nutrition Through Life Cycle | 3 | 5 |
|  | **Total**  | **20** | **30** |

**SEMESTER - II**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course status** | **Course Title** | Credits | Hours |
| Core 4 | Quantity Food Production and Service | 5 | 6 |
| Core 5  | Therapeutic Dietetics | 5 | 6 |
| Core 6 | Therapeutic Dietetics- Practical | 4 | 6 |
| Elective 3  | Sports Nutrition | 3 | 4 |
| Elective 4  | Functional Foods and Health | 3 | 4 |
|  | Skill Enhancement Course [SEC] - INME  | 2 | 4 |
|  | **Total**  | **22** | **30** |

**SEMESTER - III**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course status** | **Course Title** | Credits | Hours  |
| Core 7  | Research Methodology and Statistics | 5 | 6 |
| Core 8  | Operations Management in Food Services | 5 | 6 |
| Core 9 | Fundamentals of Food Processing | 5 | 6 |
| Core 10 | Food Product Development | 4 | 6 |
| Elective 5 | Life Style Management | 3 | 3 |
|  | Accessory designing practical |  |  |
|  | Skill Enhancement Course - II | 2 | 3 |
|  | Internship / Industrial Activity | 2 | - |
|  | **Total** | **26** | **30** |

**SEMESTER - IV**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course status** | **Course Title** | Credits | Hours  |
| Core 11 | Entrepreneurial Development | 5 | 6 |
| Core 12 | Hospital Administration | 5 | 6 |
|  | Project Work with Viva voce  | 7 | 10 |
| Elective 6 | Food Preservation | 3 | 4 |
|  | Skill Enhancement Course – III / Professional Competency Skill | 2 | 4 |
|  | Extension Activity | 1 | - |
|  | Total | **23** | **30** |

**Total Credits - 91**

**SEMESTERI**

**COREI**

**FOODSERVICEMANAGEMENT**

**CODE:**

**Time/Hrs:6Hours(Theory)Credits :4**

**Year I**

**Semester:I**

**LEARNINGOBJECTIVES**

Toenablethestudentsto:

1. Understandprinciplesoforganizationand managementinfoodserviceunits
2. Understandandapplycurrentconceptsinequipmentdesign,selectionand use,hygiene,safetyandsustainabilityoffoodservices
3. DevelopskillsrequiredformanagingaFoodServiceUnit

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Recall the classification of Food services, distinguish between differentfood service systems, relate the food production systems to the relevantfoodserviceoperations,explaincurrenttrendsinFoodservicefacilitydesignandregulationsforspecificfoodservicetypes | **K1,K2,K3** |
| **CO2** | Define the different types of organization; Explain the approaches,principles, functions and tools of management, Apply the tools ofmanagementtothevariousmanagementfunctions | **K1,K2,K3** |
| **CO3** | Classifyequipmentbasedontypeandorderofuse, explain thedifferentfinishes, design and construction features of equipment, Develop SOPforselection,operationandcareofmajorequipment | **K3,4,K6** |
| **CO4** | Explain the principles of cleaning and sanitation, create a checklist toensure personal hygiene of food Handlers, Evaluate the causes of foodhazardsand suggestsolutionsbasedon principlesofHACCP | **K3,K4,K5,K6** |
| **CO5** | Identify the causes for accidents and suggest methods for prevention;Analysemethodsofconservingenergy,conservingresources andensurezerowaste.Developstrategiesforconservingnaturalresources,energysavingandfacilitywasteassessmentandmanagement | **K2,K4,K5** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply; **K4**-Analyze; **K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **CONTENT** | **No ofhours** |
| **UnitI** | **FoodServiceIndustry-classificationandregulatoryrequirements**1. Classification of Food services based on food production systems: (i)Conventional (ii) Commissary (iii) Ready prepared (Cook chill /cookfreeze)(iv)Assembly/servefoodservicesystemsv)Cloudkitchens
2. Classificationbasedonmarketsegment/Foodservicestyle
3. Commercialandnon-commercialfoodservices
4. Cateringinhotelsandspecialty restaurants,clubs,café/coffee shop,dhaba, Fast food outlets (Quick Serve Restaurants) food trucks, Foodcarts and stands, meals on wheels, Food vending machines, take away,Onlineapp-baseddelivery,
5. Cateringintransportservices-Air,railway,cruiseships,spacemissions
6. CateringinhospitalsandeducationalInstitutions.
7. Industrial catering and community feeding (Places of worship), Socialcatering(weddings,functions)
8. Franchise,chain,contractandoutdoorcateringservices
9. Current trends in facility design, regulatory requirements and specialconsiderationsforeachspecifictype ofFoodService
 | **15** |
| **UnitII** | **OrganizationandManagement**1. Organisation-Definitionandtypes
2. Approachestomanagement-classical,neoclassical,systemsapproach,behaviouralandhumanrelationsapproach,contingencyapproach,JIT(Justintime)approach
3. Principles,functionsandtoolsofManagement andtheirapplicationinthefoodserviceindustry
 | **15** |
| **UnitIII** | **Equipmentdesign,selection,installationanduse**1. Classification of equipment. -Equipment for food storage, pre-preparation,cooking,holding,serving,dishwashingandauxiliaryequipment
2. Equipmentdesign,constructionandfinishes
3. Factorsinfluencingselectionofequipment.;Trendsinequipmentavailableinthemarket
4. Installation,principlesofoperationandcareofmajorequipment
 | **20** |
| **UnitIV** | **HygieneandsanitationintheFoodServiceunit**1. **Personalhygieneofemployees**

EmployeeHealthandpersonalhygiene,properfoodhandling-precautionsforsafefoodproduction1. **Hygiene of Plant and equipment**PrinciplesofcleaningandsanitationDishwashing-typesanduses
2. **FoodHygiene**

Infestationoffoods- signsofinfestation,controlofinfestation | **25** |

|  |  |  |
| --- | --- | --- |
|  | Time-Temperaturerelationships, potentialhazardsinfoodproduction.Theseven principlesof Hazard AnalysisandCriticalControl Points(HACCP) and their application in ensuring food safety and qualityIntroductiontoISOspecifications;COVIDProtocolaccordingtoFSSAI-forfoodproduction |  |
| **UnitV** | **Safetyandsustainability**1. **SafetyinFoodServiceunits**–causesandpreventionofaccidents,3Esofsafetyandactionforemergencies.
2. **Sustainablepracticesandgreeninitiatives**
	1. ConservationofNaturalresources-waterandenergyconservation
	2. Greendesignand energysavingin electricalequipment
	3. Integratedsolidwastemanagement-sourcereduction,reuse/upcycleandrecycle;Facilitywasteassessment;pest-control
 | **15** |
|  |  | **90** |

**REFERENCESBOOKS**

* WestB.B,WoodL, HargerV.P.,(2006),FoodServiceinInstitutions.JohnWilleyandSons,Inc., NewYork
* Sethi,M.(2016)InstitutionalFoodManagement,2nded.NewAgeInternationalPvt. Ltd.,NewDelhi.
* Sethi,M.andMalhan,S.(1993)CateringManagement.AnIntegratedApproach.2nded.NewAgeInternationalPvt.,Ltd.,NewDelhi
* Payne-Palacio J and Theis M(2019) Food Service Management-Principles andPractices,PearsonIndiaEducationServicesPvt.Ltd.Noida,India
* NegiJ(2006)FoodandBeverage:ManagementandCostcontrol.Kanishka publishers,distributors
* MalhotraR.K.(2005)FoodServiceandCatering Management,Anmolpublications PvtLtd.,NewDelhi

**E-LEARNINGRESOURCES**

* <https://legaldocs.co.in/blog/food-safety-and-hygiene-norms-in-india>
* <https://www.brainkart.com/article/Definition-and-Types-of-Equipment_35155/>
* <https://www.mooc-list.com/course/innovation-food-industry-futurelearn>
* <https://www.tutorialspoint.com/food_and_beverage_services/food_and_beverage_services_hygiene_and_safety.htm>
* <https://www.scribd.com/document/275348426/Modern-Management-Concepts-and-Skills-12th-Edition>

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | M | S | S |
| **CO2** | S | S | S | M | S | S |
| **CO3** | S | S | S | M | S | S |
| **CO4** | S | S | S | M | S | S |
| **CO5** | S | S | S | M | S | S |

**CORE I**

**INSTITUTIONALFOODSERVICE MANAGEMENT**

**Time/Hrs:6Hours(Theory) Credits :4**

**Year I Semester:I**

**LearningObjectives**

**Thecourseaimsto**

* Provideacomprehensiveunderstandingofthebasicprinciplesofmanagementin foodserviceunits.
* Helpstoacceptresponsibilitiesincateringestablishmentandhospitals
* pavesawayforbecomingaconscientiouscatererandfoodserviceadministrator

## UnitIFoodServiceEstablishment

Historyanddevelopmentb)Definitionandimportancec)FactorsaffectingdevelopmentofFood Service institutions d) Principles, tools and functions of organizations e) Recent trends infoodservice institutions. Various types offood service institutionsa) Commercial and Non-commercial b) Various institutions catering needs to different types of handicapped personnel c)VariousapproachesinthemanagementofFoodserviceInstitutions.-traditional-systemsapproach-MBO andTQM.

## Unit-II:PersonnelManagement

Definition, development and policies b) Sources of recruitment, Selection, Induction, training,development,promotion,motivationand leadershipc)Wagesandotherwelfarebenefitsforpersonneld)Laborlaws and otherlegalaspects.

Recruitment, Selection, Induction, Training and Supervision of Personnel, Labour Policies andLegislation.

## Unit-III:FoodServiceUnitLayoutandEquipment

FoodServiceUnitLayoutandDesigna)StepsanddifferenttypesofPlanning,b)VariousPhasesoflayoutandVariousfactorsinfluencinglayoutdesignc)Pointingworkcentersd)Workpattern.Equipmentsa)Classification,SelectionandDesignb)Factorsinfluencingselectionofvariousequipmentsc)Basematerialsandfinishesinfoodindustries1018d)Installationandoperatione)Careandmaintenanceofequipments.TypesofFoodService,Styles of Service, Formal and Informal. Equipments, Classification, Selection, Maintenance andCareofequipment.

## Unit-IV:FinancialManagement

Typesofbudget,Recordsforpurchase,Receiving,StorageandProductionb)Serviceandincome and expenditure record. c) Costing and cost control- - Factors affecting cost control -Importanceand ComponentsofCosting-BreakevenAnalysis-Determining Selling PriceofFood-ChecklistforCostControl

## Unit-V:InstitutionalkitchenandSanitation

Typesofkitchen,layoutofkitchen,kitchendesignplanandworksimplification.

Hygieneandsanitationinpreparationandservingareaa)Personalhygieneb)Typesandsourcesofcontaminationc)Preventionandsafetymeasuresd)Methodsofcontrollinginfestation.e)Methods ofdishwashing

## References:

1. Payne-Palacio,June,andMonicaTheis.*Foodservicemanagement*.PearsonEducationUK,2015.
2. Sethi,Mohini.*Institutionalfoodmanagement*.NewAgeInternational,2008.
3. Cousins,John,DennisLillicrap,andSuzanneWeekes.*Foodandbeverageservice*.HachetteUK,2014.
4. VijayDhawan,FoodandBeverageService,1stEdition,FrankBros&Co.,2000Braun,Verlagshans.ofSpaDesign,2009.
5. AggarwalD.K,HousekeepingManagement,AMANPublications,NewDelhi,2006.
6. Dr.Singh.R.K,ModernTrendsinHospitalityindustry,AMANPublications,NewDelhi,2006.

## Referencebooks

* 1. FospettDandPaskinsP,ThetheoryofHospitalityandCatering,HodderEducation,UK,2011
	2. JaiswalP,FoodQualityandsafety,CBSPublishersandDistributersPvtLtd,NewDelhi,2011
	3. BaliPS,QuantityfoodProductionoperations&IndianCuisine,OxfordUniversityPress,New Delhi,2011
	4. GeorgeBandChatterjeeS,FoodandbeverageServiceandManagement,JAICO,2010

## Courseoutcomes

Onsuccessfulcompletionofthecourse,thestudentswillbeabletogainknowledgeabout

|  |  |  |
| --- | --- | --- |
| K2 | **CO1** | Discussaboutthescopeoffoodservicemanagementprinciplesandfunctions. |
| K3 | **CO2** | Explainthefunctionsofpersonnelmanagementorganization |
| K4 | **CO3** | Comparethe electrical and non-electrical equipment’s in food serviceestablishment. |
| K2 | **CO4** | Analyzethecostaccountmethodsanditsimportance. |
| K3 | **CO5** | Evaluatethekindofkitchenlayout. |

**MappingofCoswithPOS&PSOs:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
| **CO1** | S | S | S | S | **M** | S |
| **CO2** | S | S | S | S | **M** | S |
| **CO3** | S | S | S | S | **M** | S |
| **CO4** | S | S | S | S | **M** | S |
| **CO5** | S | S | S | S | **M** | S |

**COREII**

**FOODSCIENCE**

**CODE:**

**Time/Hrs:4Hours(Theory)&2Hours(Practical) Year I**

**Credits :4 Semester:I**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

1. Learn the basic scientific principles underlyingfood preparation, processing,storageandpreservation.
2. Comprehendthenutritionalsignificanceofvariousfoodgroups.
3. Getacquaintedwiththerecenttrendsandnovelconceptsinfoodscience.

**COURSEOUTCOME**

O**nsuccessfulcompletion ofthecoursethestudentwillbeableto**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Understand the basic nutrition facts of different food groups anddeterminethebestcookingpracticestoretainthenutrients | **K1,K2,K3** |
| **CO2** | Acquirein-depthknowledgeinthechemistryoffoods | **K2** |
| **CO3** | Analyse the scientific principles underlying food preparation,processing, storage and develop innovativepractices to retain thequalityoffood | **K4,K6** |
| **CO4** | Identify andapply theappropriatesubjectiveandobjectivemethodswhile evaluatingfoodquality | **K3** |
| **CO5** | Analyse the role of nutraceuticals, functional foods and alternativeprotein sources and evaluate their potential as indispensable futurefoods | **K4,K5** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4** -Analyze;**K5** -Evaluate;**K6** –Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **Evaluationoffoodquality,FoodadulterationandFoodadditives**1. PhysicalCharacteristicsofFoods-Colour,appearance,Density,Volume,viscosity,tendernessandlossofweight.MicroscopicExamination,Chemicalandphysico-chemicalmethods.Sensorycharacteristicsoffood.
2. Subjective techniques- Sensitivity tests, Difference tests, Rating testsandDescriptivetests.Selectionoftastepanelmembers.ObjectiveTechniques- Measurement of colour, texture, viscosity and consistency.Factorsaffectingtheacceptabilityoffoods.
3. Foodadulteration-types,adulterantsandwaystodetectthem.
4. Foodadditives-roleincooking-FSSAI-regulations.
 | **20** |
| **UnitII** | **CerealsandPulses**1. Cereals- Rice, Wheat, Millets-structure, composition, nutritive valueand processing methods- cereal products. Storage of grains. Nutritionalsignificanceofpseudocereals-quinoa,amaranthseedsandbuckwheat.
2. Cereal cookery-Starch- Gelatinisation, factors affecting gelatinisation -changes in cooked starches-gel formation, retrogradation and syneresis.Cerealprotein-gluten,factorsaffectingglutenformation,nutrientchangesduringdifferentprocessingmethodsofcereals.Dextrinisation.
3. Pulses-composition,nutritivevalueandprocessingmethods-pulseproducts, TVP, toxins in pulses- Pulse cookery-soaking, germination,fermentation, roasting and puffing process of pulses. Effect of cookingonnutritivevalue,qualityand quantityoflegumes.
 | **15** |
| **UnitIII** | **AnimalFoods**1. Milkandmilkproducts-composition,nutritivevalue,physicalandchemical characteristics-effect of heat, acid, enzymes and tannins. Milkcookery- problems in milk cookery. Processing of milk. Milk products.Milkstorage.
2. Meat- structure, composition, nutritive value, post-mortem changes inmeat,rigormortis,ageing,tenderisationofmeat.Meatcookery-selection of meat and methods of cooking, changes in meatduringcooking. Poultry- classification, composition, nutritive value, selectionof poultry and methods of cooking. Storage and preservation of meat.Fish-classification,composition,nutritivevalue,selectionoffish,methodsofcooking,storageand preservationoffish.
3. Egg-structure,composition and nutritive value.Grading and selection.Egg cookery- coagulation of egg protein- factors influencingcoagulation-role of egg in cookery. Egg white foam-factorsinfluencingfoamformation.Storageandpreservationofegg.
 | **25** |

|  |  |  |
| --- | --- | --- |
| **UnitIV** | **Vegetables,FruitsandBeverages**1. Vegetables-classification,composition,nutritivevalue,selection,storage and preservation. Pigments- classification- effect of cooking onpigments,flavourcompounds,texture.
2. Fruits- classification, composition, nutritive value, selection, storageandpreservation.Enzymaticbrowningandits prevention.

Physico-chemicalchangesinvegetablesandfruits-ripening,respirationandtexturalchanges.Changesinnutritivevalueduetocookingandprocessing.1. Beverages-classification,typesofbeverages-fermented,non-fermented beverages, fruit beverages, malted beverages. Coffee,teaandcocoaprocessing.
 | **15** |
| **UnitV** | **Nuts,oilseeds,Fats,sugarandspices,Recentconceptsinfoodscience**1. Nuts and oilseeds- composition and nutritive value, toxicants present.Fats and oils- sources and processing- fat cookery- fat as emulsifying,leavening, shortening agent, factors affecting fat absorption- rancidity,itstypes.
2. Sugar-crystallisationandfactorsaffectingcrystallisation,caramelisation- Stages of sugar cookery and its role in Indian sweetpreparations.Spices,herbsandcondimentsusedincookery-itsmedicinalvalue.
3. Recent concepts in Food Science- Nutraceuticals, Functional foods,sustainablealternativeproteins(plantproteins,algaeandmicroalgae,mycoprotein),biofortification,organicfood
 | **15** |
|  |  | **90** |

**PRACTICAL**

**UnitI**

1. Identifyanddetect Common food adulterantsin foods.
2. Carryouta Marketsurveyonfoodadditivespresentinprocessedfoods.

**UnitII**

1. Studythefactorsaffectinggelatinizationandpreparerecipeswheregelatinisationishastenedandretarded.
2. Interpretthefactorsinfluencingthequalityofchapathis
3. Prepareanytworecipestoshowtheimpactofdextrinization.
4. Findthefactorsaffectingcookingqualityofpulses,preparerecipeswhichenhancenutritionalqualityofpulses.

**UnitIII**

1. Determinethefactorsaffectingcoagulationofmilkproteins.
2. Listtheproblemsinmilkcookeryandfindwaystoprevent them.
3. Findtheoptimumtemperatureandtimeforboilingegg.
4. Studythe factorsinfluencingeggwhitefoamformation.

**UnitIV**

1. Determine the various factors influencing the changes in vegetables with respect tocolour,textureandflavourcompounds duringcooking.
2. Observe enzymatic browning reactions in vegetables and fruits and ways to overcomethem.
3. Determinethebestmethodofpreparingcoffeeandtea.
4. Prepareonenourishing,soothing, refreshingand appetizingbeverage.

**UnitV**

1. Findthesmokingpointofoils.
2. Determinethefactorsaffectingoilabsorption
3. Observethedifferentstagesinsugarcookeryandpreparecrystallineandnon-crystallinecandies.

**REFERENCES**

**BOOKS**

* Encyclopedia of food chemistry, Editors-in-Chief:Laurence Melton, FereidoonShahidiandPeterVarelis,2019,ElsevierInc.
* SensoryEvaluationofFoods:PrinciplesandPractices,HarryT.LawlessandHildegardeHeymann,2010,SpringerLink
* FoodPreservation:PrinciplesandPractices,SamiranChavan,2016,ScitusAcademics
* FoodProcessingand Preservation, DSWarris, 2020,CBSPublishers&Distributors
* Emergingtechnologiesfor Food processing,EditedbyDA-Wen-Sun,2020,ElsevierInc.
* EssentialsofFoodScience,5thEdition,2020 EditionbyVickieA.Vaclavik,Elizabeth

W.Christian,TadCampbell,Springer

* IntroductiontoFoodScienceandFoodSystems2ndEdition2020byRickParker,MiriahPace,CBSPublishers
* EssentialsofFoodChemistry,2021byJianquanKan, KeweiChen, Springer
* FoodChemistryALaboratoryManual2ndEdition,2022byMILLERD.D.,JOHNWILEYPublishers
* Food Science, Health and Nutrition, 2017, by LOGAN BOWMAN, SyrawoodPublishers

**E-LEARNINGRESOURCES**

* <https://epgp.inflibnet.ac.in/>
* <https://www.ifst.org/lovefoodlovescience/resources>
* <https://libguides.reading.ac.uk/food/e-resources>
* <https://libguides.ntu.edu.sg/food-science-technology/eresources>
* <https://foodresearchgh.org/e-resources>

**MAPPINGOFCOWITHPSO**

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| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | M | S | S |
| **CO2** | S | S | S | M | S | S |
| **CO3** | S | S | S | M | S | S |
| **CO4** | S | S | S | W | S | S |
| **CO5** | S | S | S | M | S | S |

**COREIII**

**HUMANPHYSIOLOGY**

**Time/Hrs:6Hours(Theory)Credits :4**

**LEARNINGOBJECTIVESToenablethestudentsto**

1. Gainbasicunderstandingofhumananatomyandphysiology.
2. Understandtheintegratedfunctioningofcells,tissues,organsandsystemstomaintainlife.
3. Describe the structure of major human organs and explain their role in maintenance ofhealth.

**COURSEOUTCOMES**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto**

**CODE:**

**Year I**

**Semester:I**

**THEORY**

|  |  |
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| **S.No** | **CONTENT** |
| **UnitI** | **PhysiologyofCell,CellMembrane,NerveandMuscle**1. TheInternalEnvironment-TheConceptofHomeostasis
2. Cellular Level of Organization- Review of Structure and functions ofcellanditsorganelles.CellDivision,Controlofcellgrowthandreproduction;celldifferentiation;
3. Membrane Physiology - Transport of Substances- Diffusion, FacilitatedDiffusion,ActiveTransport.MembranePotentialandActionPotential-

RestingMembranePotential1. ExcitationofSkeletalMuscle-NeuromuscularJunction;NeuromuscularTransmission,ExcitationandContractionCoupling
 |
| **UnitII** | **Digestivesystem**1. Review of structure and function - Secretory, Digestive and Absorptivefunctions -Role ofliver,pancreasandgallbladder.
2. MotilityandhormonesofGIT.
3. Regulationoffoodintake**–**roleofhungerandsatietycentres,effectofnutrients.
 |
| **UnitIII** | **Circulatory,Cardio-VascularandRespiratorysystem**1. Blood-composition,functions,clottingandhaemostasis**.**Normallevels and functions of plasma proteins, RBC‟s, WBC‟s and platelets;Erythropoesis;Bloodgroupsand histocompatibility.
2. Structureandfunctionofheartandbloodvessels-Regulationofcardiacoutputandbloodpressure;heartfailure;hypertension.
3. Respiratory system: Review of structure and function.Role of lungsin the exchange of gases. Transport of oxygen and Co2. Exchange ofgasesat thelungsand tissues.RegulationofRespiration.
 |
| **UnitIV** | **ExcretoryandNervoussystem**1. Structure and function of nephron - Urine formation; Excretion of aconcentrated and dilute urine; Role of kidney in maintaining pH ofblood
2. Water,electrolyteandacidbasebalance–diuretics
3. Organization of Central and Peripheral nervous system. – Structure andfunctions ofthebrain,spinalcord;ANS
 |
| **UnitV** | **Immune,EndocrineandReproductivesystem**1. Cell-mediatedandhumoralImmunity-ActivationofWBCandproductionofantibodies.Rolein inflammationand defence.
2. Endocrineglands(Pituitarygland,Thyroid,parathyroid,IsletsofLangerhans,Adrenals,OvaryandTestis,Thymus,Pinealgland–structure,function,roleofhormones,regulationofhormonalsecretion
3. ReproductiveSystem-Reviewofmaleandfemale reproductivesystem; spermatogenesis, ovulation, menstruation, pregnancy andlactation;menopause
 |
|  |  |

**REFERENCES**

**BOOKS**

* Ganong, W.F. (1986): Review of Medical Physiology, 12th Edition, Lange MedicalPublication.
* Guyton,A.G.andHall,J.B.(1996):TextBookofMedicalPhysiology,9thEdition,

W.B.SandersCompany,PrismBooks(Pvt.)Ltd.,Bangalore.

* Wilson,K.J.WandWaugh,A.(1996):RossandWilsonAnatomyandPhysiologyinHeathandIllness8th Edition,ChurchillLivingstone.
* Jain,A.K.:TextbookofPhysiology.Vol.IandII.AvichalPublishingCo.,NewDelhi.
* McArdle,W.D.,Katch,F.I.andKatchV.L(1996):ExercisePhysiology. Energy,NutritionandHumanPerformance, 4thEdition,Williamsand Wilkins,Baltimore.
* Datta,ChandraniSanyal(2006):Essentialsofhumanphysiology:AITBS.
* Marieb,ElaineN.(2004):PearsonHumananatomy&physiology,6thed.
* Donnersberger,AnneB.Jones&Bartlett,(2005):8th ed.Laboratorytextbookofanatomyandphysiology.

**E-LEARNINGRESOURCES**

* https://youtu.be/uFf0zxQ3rBU
* <http://epgp.inflibnet.ac.in/Home/Download>

**MAPPINGOFCOWITHPSO**

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| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | M | M | M | M | M |
| **CO2** | S | M | M | M | M | M |
| **CO3** | S | M | M | M | M | M |
| **CO4** | S | M | M | M | M | M |
| **CO5** | S | M | M | M | M | M |

**ELECTIVE I**

**FOODMICROBIOLOGY,SAFETYANDQUALITYCONTROL**

**CODE:**

**Time/Hrs:5Hours(Theory) Year I**

**Credits :3 Semester:I**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

1. Learnaboutsignificantgeneraofmicroorganismsassociatedwithfoodandtheirproperties,as wellas thescopeoffoodmicrobiologyandfoodsafety.
2. Learn the applications of various techniques (traditional to advanced) used in foodpreservation;thestrategies forenumerationandcontrolofmicroorganisms infood.
3. Understand the needs and components of a food safety management system (FSMS)and identify microbiological hazards in the food industry using microbiological riskassessment(MRA)techniques.

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto**

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| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Recallthe important genera of microorganisms associated withfood.Understandthe Scopeoffoodmicrobiologyandfood safety. | **K1,K2** |
| **CO2** | Understand and choose suitable techniques for enumerationofmicrobesandmethods(traditionaltoadvanced)forpreservingfood | **K2** |
| **CO3** | Describetheroleofdifferent microorganismsinfoodspoilage,foodfermentationandfood-bornediseasesandsuggestwaystopreventfoodspoilageandfoodbornediseases | **K3,K4** |
| **CO4** | Evaluateand recommend methods for microbiological qualitycontrol.Createinvestigationproceduresforensuringfoodsafety&hygiene | **K4,K5,K6** |
| **CO5** | Remember the food safety rules and regulations, Comprehend the useofFoodSafetyManagementSystem(FSMS),andconductMicrobiologicalRiskAssessment. | **K2,K3,K4** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4**-Analyze; **K5**-Evaluate;**K6**–Create |

**THEORY**

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| **S.No** | **CONTENT** |
| **UnitI** | **Determinationofmicroorganismsandtheirrelevanceinfood**1. Importanceandsignificanceofmicroorganismsinfoodscience.Factors affecting the growth of micro-organisms in food – Intrinsic andExtrinsicparameter
2. Sampling, sample collection, transport and storage, sample preparationforanalysis.Microscopicandculturedependentmethods-Directmicroscopicobservation,culture,enumerationandisolationmethods
3. ChemicalandPhysicalmethods-Chemical,immunologicalandnucleicacid based methods; Culture independent techniques – PCR Based,DGGE, Metagenomics, etc.; Analytical methods for microbialmetabolites-microbialtoxinsandmetabolites.
 |
| **UnitII** | **SpoilageandPreservationofFoodsfrommicrobialcontamination**1. Characteristic features, dynamics and significance of spoilage ofdifferent groups of foods - Cereal and cereal products, vegetables andfruits, meat poultry and sea foods, milk and milk products, packed andcannedfoods.
2. Chemical,Modifiedatmosphere,Radiationoffoodsfromthemicrobiologicalangle.
3. Indicatorsofwater andfoodsafetyandquality:Microbiological

criteriaoffoodsandtheirSignificance.TheHACCPandISOsystemsforfoodsafety. |
| **UnitIII** | **Foodbornediseases andfoodsafetyconcept**1. *Bacterialfoodbornediseases*(Staphylococcalintoxification,Botulism,Salmonellosis,Shigellosis,EnteropathogenicEscherichiaColiDiarrhoea,ClostridiumPerfringensgastroenteritis,BacilluscereusGastroenteritics)*FoodBorneViralPathogens*(Norovirus,Reovirus,Rotavirus,Astrovirus,Adenovirus,Parvovirus,HepatitisAVirus)*FoodBorneAnimalParasites*Protozoa–Giardiasis,Amebiasis,Taeniasis.Roundworm–Trichinosis,*Mycotoxins:*Aflatoxicosis,Ergotism.Drugresistance-phenomenaand mechanism.
2. Foodsafetyconcept-Importanceoffood safetyinthefood processingindustry Risk classification, National and international food regulatoryagencies, General food laws and food safety regulations, Nutritional labellingregulation (mandatory and optional nutrients, nutritional descriptors andapproved health claims); Microbial contamination (including cross-contamination/indirect contamination) Chemical contamination, Physicalcontamination,Allergencontamination
 |
| **UnitIV** | **FoodSafetyPrograms**1. Definitions and importance of Good Manufacturing Practices (GMPs),PestControlProgram,Facility Maintenance,PersonalHygieneandSupplierControl
2. Sanitary Design of Equipment and Infrastructure, Procedures for RawMaterialReception,StorageandFinishedProductLoading,
3. SanitationProgram(SanitationStandardOperatingProcedures(SSOPs),ProductIdentification,TrackingandRecallingProgram,Preventive Equipment Maintenance Program, Education and TrainingProgram
 |

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| **UnitV** | **FoodSafetyRegulation forQuality Control**1. AnoverviewofFoodRegulationinIndia;Food LawsandRegulations;

Structure,organization anddutiesofregulatorysystem1. Dutiesandresponsibilitiesoffoodbusinessoperator;Registration and Licensing process and requirements; Labeling of FoodProducts;Traceability;ImportandExportofFoods;LiabilityforDefectiveProducts;Foodsafetymanagementsystemsandcertifications;
2. Regulation of special category Foods: Regulation of Irradiated foods;Regulation of Biotechnology and Genetic Modifications; Regulation ofDietarySupplements,FunctionalFoodsandNutraceuticals.
 | **15** |
|  |  | **75** |

**RelatedExperience**

1. VisittotheMicrobiologicallaboratorytostudyandanalysesamplecollectionprocedure,chemical andphysicalmethods ofmicrobialanalysis.
2. Self-learning component-Project work on FSMS/certification or online course inFSMS.

**REFERENCESBOOKS**

* + Food Safety and standards Act 2006, Rules 2011, Regulations, 2011, 10th Edition,ILBCO India,IndianLawBookCompany,2013.
	+ Early,R.(1995):GuidetoQuality ManagementSystemsfortheFoodIndustry,Blackie,Academic andprofessional,London.
	+ Gould,W.AandGould,R.W.(1998).TotalQualityAssurancefortheFoodIndustries,CTIPublicationsInc.Baltimore.
	+ Pomeraz, Y. and MeLoari, C.E. (1996): Food Analyasis: Theory and Practice, CBSpublishersandDistributor,NewDelhi.
	+ Bryan, F.L. (1992): Hazard Analysis Critical Control Point Evaluations A Guide toIdentifyingHazardsandAssessingRisksAssociatedwithFoodPreparationandStorage.WorldHealthOrganisation,Geneva.
	+ Kirk, R.S and Sawyer, R. (1991): Pearson‟s Composition and Analysis of Foods,LongmanScientificandTechnical.9th Edition,England.
	+ FAO(1980):ManualsofFoodQualityControl.2-AdditivesContaminantsTechniques,Rome.

**E-LEARNINGRESOURCES**

* + <https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000015FT/P000043/M000082/ET/1500370047M-02.pdf>
	+ <https://egyankosh.ac.in/bitstream/123456789/61874/1/UNIT%201%20Introduction%20to%20Food%20Microbiology%20Microbiology.pdf>

**MAPPINGOFCOWITHPSO**

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| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | M | M | M | M | S | S |
| **CO2** | M | M | M | M | S | S |
| **CO3** | M | M | M | M | S | S |
| **CO4** | M | M | M | M | S | S |
| **CO5** | M | M | M | M | S | S |

**ELECTIVE II**

**NUTRITIONTHROUGHLIFECYCLE**

**CODE:**

**Time/Hrs:5Hours(Theory) Year I**

**Credits :3 Semester:I**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

1. Understandtheimportanceofnutritionthroughvariouslifestages
2. Determinenutrientneedsforallagegroupsandcalculatethebasicnutritionalrequirements
3. Developaplanofactionandimplementnutritionalcareplan foreveryagegroup

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto**

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| **CO** | **COSTATEMENT** | **K LEVEL** |
| **CO1** | Recallprenatalandneonatalgrowthanddevelopment.Understandthefoetalorigins | **K1,K2,K3,K4,K5,K6** |
| ofadultdisease.Identifythecausesofintrauterinegrowthdefects.Interpretthegrowthchartandanalyzethegrowthanddevelopmentofinfants.Evaluatethenutritional |
| needsofinfants.Developbalanceddietchartsandlowcostsupplementaryfoods |
| **CO2** | Recallthegrowthanddevelopmentduringchildhood.Identifythefoodandnutrient | **K1,K2,K3,K4,K5,K6** |
| needs.Implementthedevelopmentofhealthygutmicrobiomeduringchildhood.Analyze thefactorsaffecting optimum growthanddevelopment.Evaluate the causesofnutritionaldisordersandmethodsoftreatment.Create innovativeandnutrientdense |
| packedlunchmenus.Developdietchartsforchildrenwithspecialneeds. |

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| **CO3** | Recallthedefinitionofadolescent.Understandthegrowthanddevelopmentof | **K1,K2,K3,K4,K5,K6** |
| adolescent.Identify their foodandnutrientrequirements. Recognizethecauses fortheirfoodhabitsandirregularmealpattern.Analyzetheeatingdisordersandevaluatetheprosandconsoffaddiets.Examinethecausesofproblemsduringadolescence. |
| Constructinnovativebalancedmenus. |
| **CO4** | Recallthefoodandnutrientrequirementsandunderstandthephysiologicalchanges | **K1,K2,K3,K4,K5,K6** |
| duringpregnancyandlactation.Identifythefactorsinfluencingfertilityandinterpret |
| pregnancyoutcomes.Discussthediscomfortsandcomplicationsduringpregnancyandlactation.Examinetheroleofhormonesinlactationandevaluatethecompositionof |
| breastmilk.ExplainCOVIDprotocolstobefollowedduringthis period.Create |
| balanceddietsbasedonrecommended dietaryguidelines |
| **CO5** | Statethefoodandnutrientrequirementsduringadulthoodandoldage.Recognizethe | **K1,K2,K3,K4,K5,K6** |
| needfordietarymodificationsduringthisperiod.Implementthedietaryguidelinesincreatingmenuplans.Analyzetheirconstraintsanddevelopstrategiestoovercome |
| them. |
| **K1** -Remember;**K2**-Understand;**K3**-Apply;**K4** -Analyze;**K5**-Evaluate;**K6**–Create |

**THEORY**

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| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **PrenatalandInfantnutrition**1. Foetal origins of adult disease, intrauterine growth retardation, low birthweight,cleftpalate,foetalalcoholsyndrome–causesandconsequences.
2. Infancy – current feeding practices and nutritional concerns, guidelinesfor feeding normal and low birth weight infants. Growth and nutritionalassessment – Growth chart, LBW babies – characteristics andnutritionalcare.
3. Nutritionalassessment, nutrientneeds,lactoseintolerance, infantformula–types,complementaryfoods-liquid,semi-solidandsolidfoodchoices,specialnutritionalconcerns ininfantfeeding.Feeding thepremature infant, allergies and infant obesity. Develop low costsupplementaryfoods.
 | **15** |
| **UnitII** | **Nutritionduringchildhood**1. Childhood – Growth and development, food and nutrient needs, dietaryadequacy. Factors influencing food choices, food acceptance, parentalinfluences.Developmentofhealthygutmicrobiome.Aetiology andtreatment of PEM, Vitamin A Deficiency, Anaemia. Planning meals forchildren with Attention-deficit/hyperactivity disorder (ADHD), autismanddyslexia.Immunizationscheduleforchildren.
2. School age - Growth and development, food and nutrient needs, dietaryadequacy. Food choices, meal patterns, prevention of nutrition andhealthproblems. Causes and consequences of stunting, underweight, wasting,overweight,obesityanddentalcaries.
3. Packedlunch–dietaryguidelinesandnutritionalrequirements.Planningpacked lunchforvariousincomegroups.
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| **UnitIII** | **Nutritionduringadolescence**1. Growthanddevelopment,foodandnutrientrequirements
2. Food habits, irregular meal pattern, peer pressure, eating disorders. Prosandconsofpopularfad diets. Planningbalanced dietsforadolescents.
3. Causes, consequences and treatment of adolescent pregnancy, PCOD,hormonal imbalance, premenstrual syndrome, anaemia, underweight,obesity.
 | **10** |
| **UnitIV** | **NutritioninPregnancyandLactation**1. Maternalnutrition–Factorsinfluencingfertility,foodandnutrientrequirements,Effectsofnutritionaldeficienciesduringpregnancy,Physiologicalchanges,weightgainduringpregnancy,typicalfoodpreferences,PICA
2. Effects of smoking, drugs and alcohol on stages of foetal growth andpregnancy outcome. Complications and discomfort during pregnancy -Nausea,vomiting,constipation,heartburn,PIH,eclampsia,pre-eclampsiaandgestationaldiabetes.
 | **20** |
|  | 1. Lactation and breast milk – Physiology of lactation. Nutritive value andcomposition of breast milk - Colostrum. Food and nutrient requirementsfor nursing mother, advantages of breast feeding, importance of breastfeeding over formula feeds. Public health measures for pregnant andlactatingwomen.Complications duringlactation.
2. COVID protocols for pregnant and lactating women. Planning balanceddietsforpregnantandlactatingwomen
 |  |
| **UnitV** | **Nutritionin AdulthoodandOldAge**1. Food and nutrientrequirements during adulthood.Nutritional concernsinadulthoodrelatedtonutrientdeficiencies.Signsandsymptomsofmenopause.Effect of occupational hazards, stress related disorders andlifestylemodifications toovercomethem.
2. Geriatric nutrition - Food and Nutritional requirements - Nutritional careof the elderly. Physiological changes affecting digestion and absorption.Foodselectionpatternsoftheelderly.Nutritionalproblemsofoldage.
3. Planning balanced diets for adults and elderly based on special needsandrequirements.
 | **15** |
|  |  | **75** |

**REFERENCESBOOKS**

* + Nix.S2016,Williams'BasicNutrition&DietTherapy,FifteenthEdition,Elsevier.
	+ Simon Langley-Evans, 2015 Nutrition, Health and Disease: A Lifespan Approach 2ndEdition,WileyBlackwell.
	+ JacalynJ.McComb,ReidNorman,etal.,TheActiveFemale:HealthIssuesThroughouttheLifespan2010,Humanpress.
	+ AletaL. Meyer and Thomas P. Gullotta., Physical Activity Across theLifespan:PreventionandTreatmentforHealthandWell-Being(IssuesinChildren'sandFamilies'Lives),2012, Springer.
	+ Antia, F.P., 1992, Clinical Dietetics and Nutrition Oxford University Press, NewDelhi.
	+ Corinne,R.H.,1996,Normalandtherapeuticnutrition,McmallianCo.,NewYork.
	+ Davidson, S.R. and Passmore J.F., 1989, Human Nutrition and Dietetics, ELBSLondon.
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	+ Balasubramanianetal.,1998,Dietaryguidelinesfor Indians,ICMR,NewDelhi.
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	+ Bamji et al(1996), Textbook of Human Nutrition Oxford and IBH Publishing co. Pvt.Ltd.Delhi.
	+ Shils.E.M,Shike.M,Ross.A.C,Cabellero.BandCousins.R.J(2011)ModernNutrition in Health and Disease, Eleventh Edition, Lippincott Williams and Wilkins,Philadelphia.
	+ Mahan, K.L., and Stump, S.E., 1996, Krauses Food, Nutrition and Diet therapy M.B.SaundersCo., USA.

**E-LEARNINGRESOURCES**

* + [www.four-h.purdue.edu](http://www.four-h.purdue.edu/)
	+ [www.ingenta.connect.com](http://www.ingenta.connect.com/)
	+ nal.usda.gov/fnic/lifecycle
	+ [www.fda.gov/search.html](http://www.fda.gov/search.html)
	+ <http://epgp.inflibnet.ac.in/Home/ViewSubject?catid=1827>

**MAPPINGOFCOWITHPSO**

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| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | S | S | S |
| **CO2** | S | S | S | S | S | S |
| **CO3** | S | S | S | S | S | S |
| **CO4** | S | S | S | S | S | S |
| **CO5** | S | S | S | S | S | S |

## **ABILITY ENHANCEMENT COURSE SOFT SKILL-1**

## **BAKINGAND CONFECTIONERY**

**SEMESTER I**

**YEAR I Credits:2**

**COURSEOBJECTIVES**

* 1. Tointroducetheconceptofbaking,theoryandpractice, thebasicknowledgeequipmentsused
	2. Toimpartknowledgeonroleofingredientsusedinbreads,cakes,cookies,pastriesandvariousconfectioneries
	3. Toprovideanexperienceofbakingselectedrecipesforinbreads,cakes,cookiesandpastrieswithanemphasisonspecialdietaryneeds

**UNIT-1 Introduction**tobaking-History-principlesofbaking-bakingprocess,terminologies.Equipmentandtoolsinbaking-Handtools,measuring&portioningdevices,cookware & bakeware, processing equipment, heavy equipment.

**UNIT-2 Baking ingredients**-role of each ingredient in baking, Flour-composition and type offlour in baking, Sugar-types, Shortening, Egg, Leavening agents-yeast, baking soda,baking powder etc,

**UNIT-3 Breadmaking-**ingredients,typesofprocessing,typesofbreads–leavenedandunleavened.

**Cakes** – ingredients, types of cakes **–** shortened & unshortened**.**

**UNIT-4 Pastries-**history,typesofpastries-puffpastry,shortcrust,Phyllopastry,flakypastry,choux pastry- Pies and tarts- quiches, pastry fillings.

**Cookies & biscuits** – ingredients, types and processing.

**UNIT-5 Confectionery**–chocolateandsugarbasedconfectionery.

**Chocolates**- production, types, chocolate decorations

**S**ugar based confectionery – fudge, fondant, sugar candies, marzipan, pastillage,nougatine.

**Decoration** - preparation of icing- butter cream, foam, fudge, fondant, glaze, royalicing and ganache.

## RECOMMENDEDTEXTBOOKS

1. YogambalAshokkumar,TextbookofBakeryandConfectionery,PHILearningPrivatelimted,New Delhi.2012.
2. SarahR.Lebensky,Pricillaetal.,TextbookofBaking andPastryFundamentals,thirdedition,Pearson Education Ltd, 2004

## REFERENCE BOOKS

1. The Culinary InstituteofAmerica,Baking&Pastry:MasteringtheArtandCraft,JohnWiley&Sons,IncNew Jersy. 2009
2. Paul.C.C.andPalmer.R.H.FoodTheoryandApplicationJohnWiley and Sons, N.Y, 1972
3. GriswoldR.M.TheExperimental study ofFoods, HoughtonMiffin Co.,Boston, 1979
4. HelenCharley,FoodScience,JohnWileyandSons,N.Y,1970.
5. Srilakshmi B. Food Science, NewAge InternationalLtd., Publishers. 2001
6. N.ShakunthalaManay andN.ShadaksharaSwamy,FoodFactsAndPrinciple.NewageInternational (P) Ltd., Publishers, 2001.
7. Uttam,KS.TheoryofBakeryandConfectionery–AnOperationalApproach,KanishkaPublishers,New Delhi, 2011.
8. Johnkingslee,AProfessionalTexttoBakery andConfectionery,NewAgeInternational
	1. Limited,Publishers. 2014

## Journals

* + - Journal of Confectionaries
		- JournalofCulinaryScienceandTechnology

## COURSE OUTCOMES

|  |
| --- |
|  |
| * Defineandexplaintheconceptofbakingtheoryandpracticecommunicatingusingrelevantprofessional
* literature in relation to cultural and socially acceptablenorms with aspects of quality and aesthetics.
 |
| * Illustrate and classify professional equipments used inbaking following current trends adopting safety andquality aspects.
 |
| * Identifyandexplainvarioustypesofbreads,cakes,pastries,cookiesandconfectionerywithingredientsusedinprofessionalpracticeswithinsociallyand
* culturally acceptable norms fostering best practices inhealthand quality.
 |
| * Experiment with ingredients for special dietary needs tosupport sustainable living, applying health, safety andaesthetic aspects.
 |
| * Apply the concept of baking to prepare selected recipes
* with decorations in keeping with cultural normsfostering entrepreneurial skills.
 |

**MAPPING**-COURSE OUTCOMEWITH PROGRAMME SPECIFIC OUTCOME

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 2 | 3 | 3 | 3 | 3 |

**Semester:I**

**code: SKILL ENHANCEMENT COURSE 1**

 **Computer Applications in Food Science and Nutrition**

**Credit: 2**

## Courseobjective

* 1. Understandthebasicsof computeranditsapplications
	2. Gainknowledgetouse computers
	3. Developskillsto applycomputerbasedtechnologyinFood scienceand Nutrition

## CourseOutComes

1. Afterstudied unit-1, thestudent willgain knowledgeon computerapplications.
2. Afterstudied unit-2, thestudent willapplyknowledgeon Operatingsystem and MS Office.
3. Afterstudied unit-3,thestudent acquireknowledgeoncomputer networks.
4. Afterstudiedunit-4, thestudentwill learnaboutmultimedia.
5. Afterstudiedunit-5,thestudentwillgainknowledgeoncomputernetworkingsystemandapplyinthefield offood science,nutrition and research.

**UNITI (50to100contents) TeachingHours:…**

Introduction to Computers History of Development of Computers, Main Frame, Minis, Micros andSuper Computer Systems, Binary numbers, Bits, Bytes, CPU, Input and Output Devices, Main andAuxiliaryStageDevices,SoftwareandHardware

## UNITII (50 to100 contents) TeachingHours:…

Operating Systems and MS Office Introduction to Operating Systems, Windows Applications MSWord,MS Excel. MSAccess and MS PowerPoint

## UNITIII (50to100contents) TeachingHours:…

ComputerNetworks-LAN,WAN,Intranet,Extranet,ServiceProviders,Modem,FibreOpticsBasicofHTML, WWW, URL,TCP/IP

## UNITIV (50 to100 contents) TeachingHours:…

Multimedia-BasicElements,Hardware,ApplicationofMultimedia,IntroductionMultimedia,AuthorizingTools

## UNITV (50 to100 contents) TeachingHours:…

Application of Computers in Food Science and Nutrition -Power point presentation, nutrient and dietcalculations, nutrition education and counselling, nutrition software and websites, e-journals in FoodScienceandNutrition, Useof SPSS.

## TEXTBOOKS

1. Balagurusamy.E(2008)ComputingFundamentalsandCProgramming,TataMcGrawHillEducationPrivateLimited, New Delhi.
2. Bansal.S.K (2004) Text Book of Information Technology , APH, PublishingCorporation.

## REFERENCE

* 1. AndrewS.Tanenbaum(2009)IVEdition,ComputerNetworks,PearsonEducationAndDorlingKindersleyPublishers, Delhi.
	2. JamesF.KuroseandKeithWRoss(2008)IIIEdition,ComputerNetworking.ATop-DownApproach Featuringthe Internet,PearsonEducationandDorlingKindersleyPublishers,Delhi.
	3. RalfSteinmetzandKlaraNahrstedt(2011)Multimedia-Computing, CommunicationsandApplications,Pearson Education and DorlingKindersleyPublishers,Delhi

## MappingwithProgrammeOutcomes

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
| CO1 | - | S | S | S | S | S | M | M | S | - |
| CO2 | - | S | S | S | S | S | M | M | S | - |
| CO3 | - | S | S | S | S | S | M | M | S | - |
| CO4 | - | S | S | S | S | S | M | M | S | - |
| CO5 | - | S | S | S | S | S | M | M | S | - |

**SEMESTER IICOREIV**

**QUANTITYFOODPRODUCTIONANDSERVICE**

**CODE:**

**Time/Hrs:4Hours(Theory)&2Hours(Practical) Year I**

**Credits :4 Semester:II**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

1. Developtheskilloffoodselectionandstorage
2. Acquiretheartofmenuplanning,productionandserviceoffood
3. Understandtheimportanceofhygienicfoodhandlingprocedures

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Recalltheprinciplesoffoodselection.Understandthefactorsaffectingselectionof | **K1,K2, K3,K4** |
| poultry, meat, sea food, eggs, fruits and vegetables. Gain knowledge on purchase,receiving and storage procedures, types of storage and hygienic handling of foods.Analyzetheprocessedandconveniencefoodsavailableinthemarket.Understandthe |
| importanceofHACCPinfoodproductionandservice. |
| **CO2** | Recallvariousculinarytermsandunderstandthedifferentcookingmethods.Analyze | **K1,K2,K3** |
| different cuisines. Define standardization and describe the methods ofstandardization.Recognizetheimportanceofportioncontrolandyield.Applytheknowledgeinstandardizingrecipes.ImplementtheuseofICTtoolsinmenu |
| Mechanics |
| **CO3** | Definemenuandunderstandthetypesofmenus.Analyzethefactorsaffectingmenuplanning and implement it in planning a menu. Describe menu formats and classifyrecipe files. Select appropriate menus for different types of catering. Design menucardsusingICTtoolsandcreate menusfor variousfoodserviceunitsandevents | **K1,K2,****K3,K4, K5,K6** |
| **CO4** | Discuss the main dishes and their accompaniments. Recognize the importanceofsoups,salads,salad dressings,commonsaucesandchutneys.Selectappropriatedishesforspecialfunctionsandfestivals.Developandcreatedishesfor variouscateringunitsandevents.Organizefoodstalls. | **K2,K3,****K4,K5,K6** |
| **CO5** | Recall the types of service. Describe the styles of table service. Identify the equipmentrequired for food service. Apply the rules for laying a table and examine the factors forselectionoftablecovers.Analyze theattributesoffoodservicepersonnel. Create innovative napkin folds and covers. Evaluate and select appropriatetablesettingsforvariousmealsandoccasions | **K1,K2,****K3,K4, K5,K6** |
| **K1**-Remember; **K2**-Understand;**K3**-Apply;**K4**-Analyze; **K5** -Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **Foodselectionandstorage**1. Factors affecting selection of poultry, meat, sea food, eggs, fruitsandvegetables.Typesofprocessedandconveniencefoods.Hygienic handling of foods – receiving, storage, pre preparation,productionandservice
2. Purchase–Sources,methodsandpurchaseprocedure
3. Typesofstorage,storeroomrecordsandinventories
 | **15** |
| **UnitII** | **Methodsofcookingandstandardization**1. Importantculinaryterms andmethodsofcooking
2. Cuisines–Indian,Chinese,Western,andContinental
3. Standardization–Definition,stepsandmethods.Portioncontrol,steppingupofrecipesandyield –useofICTtools
 | **15** |
| **UnitIII** | **Menumechanics**1. Definitionofmenuandtypesofmenu–Tabled‟hote,a‟lacarte,cartedejour,cyclic,ethnic,specialitymenusandFrench menu
2. Factorsaffectingmenuplanningandstepsinplanningamenu
3. Menuformatsandrecipefiles–useofICTtools
4. DesigningmenucardsusingICTtools
 | **20** |
| **UnitIV** | **Quantityfoodproduction**1. Foodpreparation–maindishesandtheiraccompaniments.
2. Soups,saladsandsaladdressings, commonsaucesandchutneys.
3. DishesforspecialIndianfunctionsandfestivals.
4. Organizing,planning,preparationandserviceofdifferent cuisinesfor25persons.
 | **20** |
| **UnitV** | **Foodservice**1. Typesofservice–selfservice,waiterservice,assistedservice,outdoor catering,vending,onlinefooddeliveryapps
2. Styles of table service – American, Russian, French, and Indian.equipmentsfor service– cutlery, hollow ware,flatware,glassware. Rules for laying a table – Formal and informal, Rules forservingfoodandbeverage,Selectionoftablelinenandmats.

Designingappropriatecoversandnapkinfolds1. Attributes andetiquetteoffoodservicepersonnel
 | **20** |
|  |  | **90** |

**INTEGRATEDPRACTICALS**

1. Standardizationofselectedrecipes
2. Steppingupofrecipesfor25portions
3. Prepareandservemeals–Indian,Chinese,AmericanandContinental
4. Tablesettingandnapkinfolds.

**REFERENCESBOOKS**

* + WestB.B.WoodL.Harger V.P.(2006)FoodServiceinInstitutionsJohnWileyandSons,Inc., NewYork
	+ KotschewarL.andTerrel M.E.(1961)FoodServicePlanninglayoutandEquipment,JohnWileyandSonsLtd.NewYork.
	+ ThangamE.Philip(2010)ModernCookeryforTeachingandthetradeVol.I&II,OrientLongmansLtd.,NewDelhi.15
	+ TerellM.E.,(1966)ProfessionalFoodPreparation,JohnWileyandSons,NewYork.
	+ LewisJ.M.,RonaldF.,(1984)–FoodServiceSystemManagementAVIPublishingcompany.
	+ PaulM.,PeterJ.,(1986)–TheManagementofcateringoperations,.Holt, PinehartandWinstonpublishers.
	+ Mohini S (2018), Institutional Food service, New Age Publications (p) Ltd, NewDelhi.
	+ KintonandCessarani(1999),TheoryofCatering,JohnWiley&Sons,London.

**E-LEARNINGRESOURCES**

* + [www.fda.gov](http://www.fda.gov/)
	+ [www.wadsworth.com/nutrition](http://www.wadsworth.com/nutrition)
	+ [www.ific.org](http://www.ific.org/)
	+ wwwvrg.Org
	+ <http://epgp.inflibnet.ac.in/Home/ViewSubject?catid=1827>

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | M | S | S |
| **CO2** | S | S | S | S | S | S |
| **CO3** | S | S | S | S | S | S |
| **CO4** | S | S | S | M | S | S |
| **CO5** | S | S | S | M | S | S |

**COREV**

**THERAPEUTICDIETETICS**

**CODE:**

**Time/Hours:6Hours(Theory)Credits 4**

**Year I**

**Semester:II**

**LEARNINGOBJECTIVES**

**Thiscoursewillenablestudentsto**

1. Understandthe aetiology,physiologic&metabolicanomalies ofacuteand/orchronicdiseasestatesandits effectonnutrientrequirements.
2. Identifythecrucialpointsofdisease managementthroughnutritionsupport.
3. Recommendappropriatenutritiontherapyforvariousdiseaseconditions.

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto:**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Explainpathophysiology,signsandsymptomsandnutritionmanagement of the various disease conditions of upper and lowerGastroIntestinaltract. | **K1,K2,K3** |
| **CO2** | Enumeratethetypes,etiology,symptomsandcomplicationsandexplainthedietarymanagementofdiseasesofliver,Biliaryandpancreaticdiseases. | **K1,K2,K3** |
| **CO3** | ComprehendthenutrientrequirementforeachdiseaseconditionincludingCardiovascular, RenalandLungdiseases | **K1,K2,K3** |
| **CO4** | Demonstrateskillincalculatingandclassifyingthedegreesofobesityandproficiencyinidentifyingthe diettherapyforweightmanagementandrelatedinterventions. | **K4,K5** |
| **CO5** | Identifytheindications,contraindications,routesofdeliveryanddevelop a monitoring system for Enteral andParenteral Nutritionsupport. | **K5,K6** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4**-Analyze;**K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **CONTENT** | **HOURS** |
| **UnitI** | **MedicalNutritionTherapyforGastrointestinalDiseases**1. DietarymanagementofUppergastrointestinaldiseases:

Etiology, signs & symptoms, complications and dietary managementfor:Gastro-oesophagealrefluxdisease(GERD),Oesophagitis,OralCavityCancerStomach:Dyspepsia,Gastritis,Peptic&DuodenalUlcer,StomachCancer,Gastric Surgery,DumpingSyndrome1. DietarymanagementofLowergastrointestinaldiseases

Etiology, signs & symptoms, complications and dietary management ofFlatulence,Constipation,Diahorrea,Steatorrhea,CeliacDisease,Lactose Intolerance, Cow‟s Milk Protein Allergy, Inflammatory BowelDisease(UlcerativeColitis&Crohn‟sDisease),IrritableBowelSyndrome,Diverticulosis&Diverticulitis,ShortBowelSyndrome(SBS),Ileostomy,Colostomy, ProteinLosingEnteropathy | **20** |
| **UnitII** | **MedicalNutrition TherapyforLiver,Biliary &PancreaticDiseases**1. Physiology,functionsofLiverandLiverfunctiontests.DietarymanagementofAcute&ChronicHepatitis,Non-alcoholicSteatohepatitis(NASH),Stages&ProgressionofLiverDisease,Wilson‟sDisease,HepaticEncephalopathy.
2. Etiology,symptomsanddietarymanagementofCholelithiasis,Cholecystitisandcholecystectomy.
3. Dietary management and diagnostic tests of Pancreatic disorders; Acute& Chronic Pancreatitis, Type 1 Diabetes, Type 2 Diabetes, GestationalDiabetes.
 | **15** |
| **UnitIII** | **Medical Nutrition Therapy for Cardiovascular, Renal & LungDiseases**1. Prevalence, Pathophysiology, risk factors, diagnostic tests and dietarymanagementofcardiovasculardiseases;Atherosclerosis,Hyperlipidaemia,Hypertension,Anginapectoris,Myocardialinfarction,congestiveheartfailure.
2. Pathophysiology,classification,diagnostictests,riskfactorsanddietary management of renal diseases: Glomerulonephritis, NephroticSyndrome,Nephrolithiasis,AcuteKidneyInjury,ChronicKidneyDisease
3. Pathophysiology,riskfactorsanddietarymanagementoflungdiseases:Asthma,ChronicObstructivePulmonaryDisease(COPD),Tuberculosis,LungCancer
 | **20** |
| **UnitIV** | **Medical Nutrition Therapy for Weight Management and OtherConditions**1. Etiology,classification,clinicalmanifestation,energybalance,management of Obesity: Components & regulation of Body Weight,Types & causes of Obesity, Nutritional Management, Nutrition postBariatricSurgery
2. Etiology,clinicalmanifestationandDietarymanagementofUnderweight,HyperandHypothyroidism
3. Classification,hydrationcalculation,dietarymanagementinBurns,AIDS,Dysphagia,Stroke,Gout,Anaemia,Fever.
 | **20** |

|  |  |  |
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| **UnitV** | **AdvancedNutritionIntervention**1. Assessment,calculation,formulation,andmonitoringofEnteralNutritionSupport:Indications,Contraindications,Routesofaccess,Types of Enteral Formulae & its composition, NutrientDelivery &Monitoring
2. Assessment,calculation,formulation,andmonitoringofParenteralNutritionSupport:Indications,Contraindications,Routesofaccess,calculationofParenteralNutrition,NutrientDelivery&Monitoring
 | **15** |
|  |  | **90** |

**REFERENCES**

**<**

**BOOKS**

* + Mahan, L.K. & Escott-Stump, S. (2008) Krause's Food & the Nutrition Care Therapy,InternationalEdition,12thEdition,Saunders ElsevierPublication.
	+ Shils,M.E.,Olson,J.A.,Shike,M.andRoss,A.C.(1999):ModernNutritioninHealthandDisease,9thEdition,WilliamsandWilkins
	+ Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics,10thEdition,ChurchillLivingstone
	+ Sue Rodwell Williams (2013) Nutrition,DietTherapy (9th ed.). WB SaundersCompany,London
	+ NixS.(2013)Williams'BasicNutrition&DietTherapy.14thEdition.Pub.Elsevier
	+ VinithaKrishnan(2013) Nutritionplanningaidforpracticingdietitians.

**JOURNAL**

* + NutritionUpdateSeries
	+ WorldReviewofNutritionandDietetics
	+ JournaloftheAmericanDieteticAssociation
	+ AmericanJournalofClinicalNutrition
	+ EuropeanJournalofClinicalNutrition
	+ NutritionReview

**E-LEARNINGRESOURCES**

* [https://www.espen.org](https://www.espen.org/)
* <https://www.nutritioncare.org/home>
* [https://www.idf.org](https://www.idf.org/)
* [https://ispad.org](https://ispad.org/)
* [https://www.diabetes.org](https://www.diabetes.org/)
* [https://www.eatright.org](https://www.eatright.org/)

**MAPPINGOFCOWITHPSO**

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| --- | --- | --- | --- | --- | --- | --- |
| **CO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | M | S | S |
| **CO2** | S | S | S | M | S | S |
| **CO3** | S | S | S | M | S | S |
| **CO4** | S | S | S | M | S | S |
| **CO5** | S | S | S | M | S | S |

**COREVI**

**THERAPEUTICDIETETICSPRACTICAL**

**CODE:**

**Time/Hours:6Hours**

**Credits 4**

**LEARNINGOBJECTIVES**

**Year I**

**Semester II**

1. Enablestudentstouse,applyandinterpretvariousmethodsofscreeningandassessmentofnutritionalstatus.
2. Understandcommonlyusedtests fordiagnosisofvariousdiseases
3. Apply principles of diet therapy in planning and preparation of foods for variousdiseaseconditions.
4. Evaluateandunderstandnutritionlabelstomakeinformedfoodchoicesforselfandeducatepatients.
5. Knowthevariousnutritionalsupplementsavailableandidentifyitsappropriateusage.

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecourse,thestudentwillbeableto:**

|  |  |  |
| --- | --- | --- |
| **No.** | **COURSEOUTCOMESTATEMENT** | **KLEVEL** |
| **CO1** | Recall and understand various methods of nutritional screening anduse of assessment tools. Select the appropriate screening methodsandassessmenttoolsforthepurposeonhand.Acquiretheskilltoaccuratelyassessandinterpretthenutritionalstatusoftheindividual. | **K1,K2,K3** |
| **CO2** | Applydieteticprinciplesin planning,preparingandevaluatingmealsintended forvariousdiseaseconditions. | **K3,K5,K6** |
| **CO3** | Applydieteticprinciplesinplanning,preparingandevaluatingmealsintendedforpatientsrequiring modificationinconsistencyoffood-stroke,gastrointestinaldiseaseconditions. | **K3,K5,K6** |
| **CO4** | Analysenutritionlabelsofnutritionalsupplementsanddetermineitsappropriate usage | **K4** |
| **CO5** | Execute a market survey on nutraceuticals and nutritionsupplements,analyseand preparetubefeedingformulas. | **K5,K6** |
| **K1** -Remember;**K2**-Understand;**K3**-Apply;**K4**-Analyze;**K5**-Evaluate;**K6**–Create |

**CONTENT**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **CONTENT** | **HOURS** |
| **UnitI** | **DietitianSkillsTraining–I(StepsinvolvedinNutritionAssessment&Screening)**1. Nutrition Screening & Assessment Tools: Malnutrition UniversalScreening Tool (MUST), Nutrition Risk Screening (NRS-2002),MiniNutritionalAssessment(MNA),SubjectiveGlobalAssessment (SGA), Global Leadership Initiative for Malnutrition(GLIM)Criteria
2. Bed-sideassessmenttools:NutritionFocusedPhysicalExamination(NFPE),AnthropometricAssessment,BodyMassIndex (BMI), Bioelectrical Impedance Analysis (BIA), Hand-gripdynamometer, Skin-fold Thickness, Biochemical parameters & itsrelationtodiseaseconditions
3. Problem, Aetiology, Signs & Symptoms (PESS) Statement –Casestudies
 | **25** |
| **UnitII** | **PreparationofTherapeuticDiets–I**1. Planning, preparation and calculation of nutritive value of samplediet for conditions such as-Typhoid, Jaundice, Hepatitis, Cirrhosis,Pancreatitis,Cholelithiasis,COVID-19.
2. PlanningandpreparationandcalculationofnutritivevalueofsampledietforconditionssuchasHyperlipidaemia,Obesity,

Hypertension, Stagesofrenaldisease,Renalcalculi1. CarbohydrateCountinginDiabetes
 | **20** |
| **UnitIII** | **PreparationofTherapeuticDiets–II(PreparationofSampleMenu)**1. PlanningandpreparationofsampledietforAnaemia
2. Planning,preparationandcalculationofnutritivevalueofsampledietforUlcerativeColitis,Crohn‟sDisease,LactoseIntolerance,

CeliacDisease1. MenuPlanningforDysphagiainStroke,Constipation,Diahorrea.
 | **15** |
| **UnitIV** | **DietitianSkillsTraining–II**1. ConstructionofanExchangeListforCalorie,CarbohydrateandPotassium.
2. Understanding Nutrition Labelling, Market Survey andevaluationoffoodproducts.
 | **15** |
| **UnitV** | **AdvancedNutritionIntervention**1. Familiarisingandanalysingthenutritionsupplementsavailableforvarious diseaseconditions.
2. PlanningandPreparationoftubefeedsbasedoncasestudy.
 | **15** |
|  |  | **90** |

**REFERENCESBOOKS**

* Mahan, L.K. & Escott-Stump, S. (2008) Krause's Food & the Nutrition Care Therapy,InternationalEdition,12thEdition,Saunders ElsevierPublication.
* Shils,M.E.,Olson,J.A.,Shike,M.andRoss,A.C.(1999):ModernNutritioninHealthandDisease,9thEdition,WilliamsandWilkins
* Garrow,J.S.,James,W.P.T.andRalph,A.(2000):HumanNutritionandDietetics,10thEdition,ChurchillLivingstone
* Sue Rodwell Williams (2013) Nutrition,DietTherapy (9th ed.). WB SaundersCompany,London
* NixS.(2013)Williams'BasicNutrition&DietTherapy.14thEdition.Pub.Elsevier
* VinithaKrishnan(2013)Nutritionplanningaidforpracticingdietitians.

**JOURNALS**

* NutritionUpdateSeries
* WorldReviewofNutritionandDietetics
* JournaloftheAmericanDieteticAssociation
* AmericanJournalofClinicalNutrition
* EuropeanJournalofClinicalNutrition
* NutritionReview

**E-LEARNINGRESOURCES**

* [https://www.espen.org](https://www.espen.org/)
* <https://www.nutritioncare.org/home>
* [https://www.idf.org](https://www.idf.org/)
* [https://ispad.org](https://ispad.org/)
* [https://www.diabetes.org](https://www.diabetes.org/)
* [https://www.eatright.org](https://www.eatright.org/)

**MAPPINGOFCOWITHPSO**

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| **CO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | S | S | S |
| **CO2** | S | S | S | S | S | S |
| **CO3** | S | S | S | M | S | S |
| **CO4** | S | S | S | M | S | S |
| **CO5** | S | S | S | M | S | S |

**ELECTIVE III –SPORTSNUTRITION**

**CODE:**

**Time/Hours:5Hours(Theory)Credits 3**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

**Year I**

**Semester:II**

1. Learntheeffectsofexercise onthephysiologicalandenergysystemsofthebody.
2. Understandthelinkbetweenexerciseand thedemanditplacesonthenutrientsin thebody
3. Translatenutrientgoalsofanathleteintoappropriatedietplansthatcanenhanceperformance

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto:**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Recalltheprinciplesofexercisetraining,distinguishbetweenvarious types of athletes and methods of body assessment, relatebodycompositiontoperformanceandidentifysuitabletrainingandeatingplansforweightmanagement | **K1,K2,K3** |
| **CO2** | Explain the structure of muscle fiber, process of skeletal musclecontraction. Discuss muscular plasticity, cardio pulmonaryadaptationandendocrinalresponse toexercise | **K2** |
| **CO3** | Demonstratetheskilltochoosefoodsandcreatemealplansbefore,duringandafterexerciseorcompetitionwhichenhanceperformance | **K4,K6** |
| **CO4** | Identify and include foods in daily eating plans that meet theenhancedmicronutrientrequirementsofanathlete | **K3** |
| **CO5** | Analysehydrationandelectrolyterequirementsofanathleteandevaluatedietarysupplements forrecommendationto athletes | **K3,K5** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4** -Analyze;**K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **Exercise–Principles, AssessmentandWeightManagement**1. Definition of Exercise, Types of exercise, Principles of Exercisetraining.TypeofAthlete-Resistance,EnduranceandPowerathlete
2. Assessment- Methods of assessment of Body Composition,

Relationshipbetweenbodycompositionandperformance1. WeightManagement-Weightlossandweightgainaspreparationforcompetition
 | **15** |
| **UnitII** | **ExercisePhysiologyandEnergySystems**1. Muscle Physiology- Structure of skeletal muscle, muscle fiber types,muscularcontraction,muscularadaptationtoexercise;Cardiopulmonaryresponseand adaptationtoexercise;

Exercisetrainingandendocrinesystem1. Energysystemforexercise-CreatininePhosphateenergysystem,

anerobicglycolyticsystem,aerobicenergysystem-oxidativephosphorylation | **15** |
| **UnitIII** | **Fuellingforexercise**1. Carbohydrate-utilizationofcarbohydrateduringexercise,carbohydrate recommendations for athlete, guidelines for intake before,duringandafterexercise;carbohydrateloading
2. Protein- protein recommendation for athletes, timing of protein intake,effects of inadequate and excessive protein intake on performance andhealth, use of protein and amino acid supplements, consideration ofproteinintakeforvegetarianathletes.
3. Fat- Fat asasourceofenergyfor exercise, fat loading, fatrecommendationforathlete,effectofinadequateintakeoffatonperformanceandhealth
 | **15** |
| **UnitIV** | **RoleofVitaminsandMinerals**1. Vitamins-recommendedintakeofvitaminsforathletes,Influenceofexerciseonvitaminrequirements,antioxidantfunction
2. Minerals–recommendedintakeofmineralsforathlete;importanceofCa.Fe,ZincandMginanathlete‟s diet; femaleathletictriad
 | **15** |
| **UnitV** | **RoleofFluid,ElectrolytesandNutritionalSupplements**1. Effect of exercise on fluid and electrolyte balance; hypohydration,hyperhydration,hyponatremia,maintenanceofhydrationbefore,duringandafterexercise.Useofsports drinks
2. Definitionofnutritionalergogenicaids anddietarysupplements.Types of dietarysupplements most frequentlyused byathletes, benefitsand/orrisksintheuseofsupplements,mechanismofactionandsupplementprotocol.
 | **15** |
|  |  | **75** |

**REFERENCES**

**BOOKS**

* BeanA(2000)„Thecomplexguidetosportsnutrition‟A&CBlackPublishers,London
* ClarkN(2003)„SportsNutritionGuidebook‟,HumanKinetics,U.S.A.
* DunfordMandDoyleAJ,NutritionforSportandExercise,ThomsonWadsworth,Australia.
* FinkHH,MikeskyAE,Burgoon LA(2012)PracticalApplicationsinSportsNutrition,JonesandBarlettLearning,U.S.A.
* BagchiD.,NairS.,SenC.K.,Ed.,(2013)Nutrition andEnhancedSportsPerformance-MuslceBuilding,EnduranceandStrength,Elseveir,AcademicPress,UK,USA.
* SrilakshmiB,Suganthi.,AshokC.K.,(2016)-ExercisePhysiology,FitnessandSportsNutrition,New AgeInternational PrivateLimited

**E-LEARNINGRESOURCES**

* + <http://www.aco.org.nz/pdf/nutrition-for-sports>
	+ https:/[/www.rese](http://www.researchgate.net/publication/258630492_Sports_Nutrition_)a[rchgate.net/publication/258630492\_Sports\_Nutrition\_](http://www.researchgate.net/publication/258630492_Sports_Nutrition_)Book\_2013http://themedicalbiochemistrypage.org

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | S | S | S |
| **CO2** | S | S | S | S | S | S |
| **CO3** | S | S | S | S | S | S |
| **CO4** | S | S | S | S | S | S |
| **CO5** | S | S | S | S | S | S |

**ELECTIVEIV**

**FUNCTIONALFOODSANDHEALTH**

**CODE:**

**Time/Hours:5Hours(Theory)Credits 3**

**Year I**

**Semester:II**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

1. Get an overview of the field of functional foods, nutraceuticals and natural healthproducts.
2. Understandthefunctionalfoodconceptasrelatedtoingredientefficacyandsafety.
3. Getfamiliarwithexamplesofbioactiveingredient-diseaserelationships

**COURSEOUTCOME**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Describecomponentsofnutraceuticalandfunctionalfoods.Distinguish between conventional foods vs. functional foods aswellasnutraceuticalsvs.pharmaceuticals. | **K1,K2,K3** |
| **CO2** | Critically evaluatethehealthbenefitsNutraceuticals | ofdifferenttypes | of | **K2,K5** |
| **CO3** | Distinguishbetweenprebioticandprobioticfoods,theirsources,healtheffectsandpotential forriskreductionofdiseases | **K4,K6** |
| **CO4** | Discussthetherapeuticpotentialoffunctionalfoodsbasedonthebioactiveingredients presentinthem. | **K5** |
| **CO5** | Recall the functional properties ofrecommendtheirappropriateusage | Indian Superfoods | and | **K2,K3** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4**-Analyze;**K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **Conceptoffunctionalfoodsandnutraceuticals**1. FunctionalFoodandNutraceuticals-Definition,history,typesandclassification.
2. Benefitsoffunctionalfoodsandnutraceuticals
3. Criteriatodiscriminatebetweenconventionalandfunctionalfoods.Roleof functional foods in health promotion and disease prevention. Marketforfunctionalfoodsandfactors drivingtheirgrowth
 | **15** |
| **UnitII** | **Probiotics**1. Definitionandimportantfeaturesofprobioticmicro-organisms,Healtheffects ofprobiotics.
2. Probioticsinvariousfoods:fermentedmilkproducts,non-milkproductsandsafetyaspectsofprobiotics.
 | **15** |
| **UnitIII** | **Prebiotics**1. Definition,sources,effectofprocessing,physiologicaleffects,effectsonhumanhealthandpotentialapplicationsinriskreductionofdiseases.
2. Food applications of – non-digestible carbohydrates /oligosaccharides,Dietaryfibre, Resistantstarch,Gums.
 | **15** |
| **UnitIV** | **Functional foods and bioactive ingredients for risk reduction ofdiseases**1. Bioactive compounds in foods- Polyphenols, Flavonoids, catechins,isoflavones,tannins, Phytoesterogens, Phytosterols, Glucosinolates,OrganosulphurCompounds,Othercomponents–Phytates,Protease.
2. Definition, sources, effects on human health and potential applicationsinriskreductionofdiseases.
 | **15** |
| **UnitV** | **TherapeuticpotentialofIndianSuperfoods**1. SpicesandCondiments
2. Herbsandmedicinalplants
3. Milletsandtraditionalricevarieties,spirulina,chlorella
 | **15** |
|  |  | **75** |

**REFERENCES**

**BOOKS**

* + Aluko, Rotimi,Functional Foods and Nutraceuticals,Springer-Verlag New YorkInc.,2012.
	+ SatinderKaurBrar,SurinderKaurandGurpreetSinghDhillon,NutraceuticalsFunctionalFoods,2014.
	+ RobertE.C.Wildman,Robert,Wildman,TaylorC,HandbookofNutraceuticalsandFunctionalFoods, ThirdEdition,Wallace,2002.

**E-LEARNINGRESOURCES**

* + <http://www.aco.org.nz/pdf/nutrition-for-sports>
	+ https:/[/www.rese](http://www.researchgate.net/publication/258630492_Sports_Nutrition_Book_201)a[rchgate.net/publication/258630492\_Sports\_Nutrition\_Book\_201](http://www.researchgate.net/publication/258630492_Sports_Nutrition_Book_201)3http://themedicalbiochemistrypage.org

**MAPPINGOFCOWITHPSO**

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| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | M | M | M | M | S | S |
| **CO2** | M | M | M | M | S | S |
| **CO3** | M | M | M | M | S | S |
| **CO4** | M | M | M | M | S | S |
| **CO5** | M | M | M | M | S | S |

SOFT SKILL 2 - C**ULINARYTECHNIQUES**

**Credit :2**

|  |
| --- |
| **CourseObjectives:** |
| **Themain objectives ofthis courseareto:To enablestudents****1.Todevelopskillsneededforacareerinthefoodserviceindustry.Tolearnavarietyofcookingtechniques** |

 **Semester -II Year - I**

|  |
| --- |
|  |
| **ExpectedCourseOutcomes:** |
| **Onthesuccessful completionofthecourse,student willbe ableto:** |
| 1 | **Understandthepreparationof cakesandother bakeryandconfectionaryitems.** | K2 |
| 2 | **Applytheknowledgeinsettingupadietaryorfoodserviceunit .** | K3 |
| 3 | **Analyzethequalityoffoodsandfood preparationarea.** | K4 |
| 4 | **Evaluatethequalityof packedfooditems.** | K5 |
| 5 | **Createawarenessonthegovernmentalregulations.** | K6 |
| **K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create** |
|  |
| **Unit:1** | **WORKSTATIONSETUP** |  |
| **Workstationset-upTheessentialsforsettingupworkstationsinbasiccommercialandinstitutionalsettings.Setupofthegrill,hotandcoldfoodstations,salad,dessert,andbakingstations.Culinarytools****HandTools,LightKitchenEquipment,HeavyKitchenEquipment–typesand uses** |
|  |
| **Unit:2** | **Cake decorations** |  |
| **Preparationsofbuttercreamandglazedicings.Cake****decoration.Sweeteningsubstitutionsforsugar-restricteddiets.** |
|  |
| **Unit:3** | **VEGETABLECUTTINGANDSALADDRESSINGS** |  |
| **VegetablecookingVegetarianentreesandsidedishes.Vegetablescutsanddifferentmethodsofpreparing common vegetables including boiling, steaming, and sautéing. Vegetables used for flavoringandgarnishing. Vegetablecarving.****SaladsComponentsandpreparation ofsaladsand saladdressings.Saladpreparation includesfruit,vegetable,leafygreen,meat,seafood,gelatin,andpastasaladsdressingsmadefromthethreebasictypes****of salad dressings – oil and vinegar, mayonnaise, and boiled or cooked. Sandwich production Preparationofhot, cold, and grilledsandwiches.** |
|  |
| **Unit:4** | **SOUPS&GRAVIES** |  |
| **Soups, stocks, sauces, and gravies Common procedures used to prepare stocks, ingredients used inmakingstocks,andthefunctionofastockinmakingsaucesandsoups.Classificationsofsoups,preparations methods of thickening, holding, and serving. Classic and contemporary sauces and the usesfeaturingthefive major saucesin the culinaryfield.****Unit 5 Beverages****Beverages Hot and cold beverages and proper serving methods.Beverage products prepared with andwithout caffeine.Breakfastdrinks suchashotcocoaandpartybeveragessuchasfruit-basedpunches.****DairyproductsTheuseofdairyproductsasthickening,binding,adhesive,emulsifying,clarifying,and****lightening.Typesofmilkproductssuchascheese,cream,sourcream,andwhippingcream.Desserts** |

**Skill enhancement course 2: FUNDAMENTALS OF FOODPROCESSING**

**Credits: 2 SEMESTER -2 YEAR -I**

**UnitIPre-andpost-harvestprocessing**

Pre-andpost-harvestprocessing:concepts,principles,advantagesofpre-andpost-harvestprocessing,natureofharvestedcrop,plant,andanimalproducts.Maturityindex

## UnitIIProcessingandpreservation

Processing and preservation by heat: Blanching, Pasteurization, sterilization and UHTprocessing, canning, extrusion cooking, dielectric heating, microwave heating, roasting,andfrying.

## UnitIIIDifferentpreservation

Preservation using low temperature: Refrigeration, freezing, CA,MA & freeze-drying principles, mechanism of action, and effect on the quality of foodproductquality,advantages,anddisadvantages.

## UnitIVotherpreservationmethods

Foodirradiationandchemicalpreservation:Foodirradiationregulationsinfoodirradiation.Foodadditivesandchemicalpreservatives:

## UnitVFermentation methods

Food fermentation: objectives, principles, advantages of fermentation, fermentedfoods, pickling, and smoking.

## Textbooks:

1. Rao,M.A.,S.S.H.Rizvi,andA.K.Datta―EngineeringPropertiesofRood¦,3rdEdition, Taylor &Francis,2005
2. Majumdar,A.S.―DehydrationofProductsofBiologicalOrigin¦,Oxford&IBHPublication,2004
3. Fellows,P.J.Foodprocessingtechnology:PrincipleandPractice.2ndEd.CRCPublishers,2005

## Referencebooks

1. DesrosierNW&JamesN.Technologyoffoodpreservation.AVI.Publishers,2007
2. Das,H.―FoodProcessingOperationsAnalysis¦,AsianBooks,2005

## COURSEOUTCOMES

Onsuccessfulcompletionofthecourse,thestudentswillbeabletogainknowledge

about

|  |  |  |
| --- | --- | --- |
| K6 | CO1 | Understandthepre-andpost-harvesttechnology |
| K2 | CO2 | Differentprocessingmethods |
| K2 | CO3 | Varioustechniquesinfoodprocessing |
| K5 | CO4 | Chemicalpreservationmethods |
| K3 | CO5 | Thermalprocessingmethods |

**MappingofCOswithPOs&PSOs:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO****/PO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| **CO1** | S | **S** | S | **S** | **S** | **S** | M | **S** | S | **S** | **S** | S |
| **CO2** | S | **S** | M | **S** | **S** | **S** | S | **S** | S | **M** | **S** | S |
| **CO3** | S | **S** | S | **S** | **S** | **S** | S | **S** | S | **M** | **S** | S |
| **CO4** | S | **S** | M | **S** | **S** | **S** | S | **S** | S | **S** | **S** | M |
| **CO5** | S | **S** | S | **S** | **S** | **S** | M | **S** | S | **S** | **S** | S |

**SEMESTER III**

**CORE VII- RESEARCHMETHODOLOGYANDSTATISTICS**

**Time/Hours:5HoursCredits 4**

**LEARNINGOBJECTIVES**

**Toenablestudentsto**

**CODE:**

**Year II**

**Semester:III**

1. Gainaclearunderstandingofbasicconcepts,approachesandmethodsinconductingresearch.
2. Appreciateandcritiquethenuancesofdesigningaresearchstudyandtheethicaldimensionsinvolvedinconductingresearch.
3. Apply appropriate statistical techniques for data collection, analysis and interpretationinanygivenstudyinthefieldfoodservicemanagementand dietetics
4. Acquireskillsrequiredinpreparingaresearchproposal.

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto**

|  |  |  |
| --- | --- | --- |
| **CO No.** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Demonstrate knowledge of the scientific method, purpose and approachestoresearch. Explain the basic concepts and approaches to research. Become aqualifiedresearcher. | **K2, K4** |
| **CO2** | Identifyandselectappropriatetechniquestoselectsamplesandtoolsofmeasurementforthechosenresearchproblemathand | **K2, K3** |
| **CO3** | Analysethetypesoftoolsapplicabletoresearchproblem;Acquireskillsinpreparingaresearchproposaland constructcommondatacollectiontools | **K3,K4,K5,K6** |
| **CO4** | Conductstatisticalanalysisforthegivendata,interprettheresultsanddepictfindingswithsuitableuseoftablesandpictorialrepresentations | **K3, K4,K6** |
| **CO5** | Presentresearchdatainascientificmannerandunderstandthekeyelements of a research report. Utilize computer applications for researchinfoodservicemanagementanddietetics. | **K3, K5** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4**-Analyze;**K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |
| --- | --- |
| **S.No** | **CONTENT** |
| **UnitI** | **FoundationofNutritionResearch**Meaning, Objectives and Classification of Research Designs –Exploratory,Descriptive–LongitudinalandCrosssectional,Retrospective,andExperimental–Pre-Experimental,QuasiExperimentalandTrueExperimentaldesigns.**ResearchProcess-**SelectionandFormulationofResearchProblemObjectivesofResearchHypothesis:Definition, Importance,TypesandErrors-I&IIDecidingVariables |
| **UnitII** | **Scaling,SamplingandSampleDesign**SamplingProcessandCharacteristicsofgoodSamplingClassification of Sampling Techniques - Probability and Non-ProbabilitySampling**Scaling**1. NominalScale
2. OrdinalScale
3. IntervalScale
4. RatioScale
 |
| **UnitIII** | **DataCollectionandPreparationDataCollection– Tools–PrimaryData**1. Interviews–Structuredandunstructured
2. Casestudies
3. Questionnaire
4. Surveys–Pilot&KAPs.
5. LaboratoryExperiments

**SecondaryData**1. PublishedSources
2. UnpublishedSources

**Reliability and Validity of Tools– MeaningDataPreparationProcess–**Editing,Coding,Classification,Tabulation |
| **UnitIV** | **StatisticalMethods**ParametricandNon-Parametrictests–DifferenceandApplications**DataAnalysisProcess-DescriptiveAnalysis-**GraphicalandDiagrammaticPresentations**QuantitativeAnalysis-BasicConceptandSimpleSums**MeasuresofCentralTendency–Mean,Median&Mode –BasicconceptandsimplesumsMeasureofDispersion-StandardDeviation**StatisticalInference–BasicConceptandSimpleSums**TestsofHypothesist –testANOVA– OneWay&TwoWayChi-squaretest–GoodnessofFit&TestofIndependenceRegressionand |

|  |  |  |
| --- | --- | --- |
|  | correlation |  |
| **UnitV** | **ReportingtheFindingsandComputerApplicationsBasicsofReportWriting–**ImportanceTypesMechanicsGuidelinesandPrecautionsEnd Notes- Bibliography, Appendices, Footnotes and Glossary of terms**Computer Applications in Nutrition Research-importance andUsesApplicableStatisticalAnalysis Software-**LiteratureSearching-PubMedData Analysis- Micro Soft Excel, SPSSPlagiarism Checker – Turnitin, ScribbrReferenceManager-Mendeley | **15** |
|  |  | **75** |

**REFERENCESBOOKS**

* + RanjitKumar(2011).ResearchMethodology:astep-by-stepguideforbeginners,SAGEPublications.3rdedition.
	+ Anderson, David R and et.al. (2013): Statistics for Business and Economics.Delhi,CengageLearningIndiaPvtLtd.11thEd.
	+ Bandarkar, P.L. and Wilkinson T.S. (2000): Methodology and Techniques ofSocialResearch.HimalayaPublishingHouse,Mumbai.
	+ Bell, Judith (2005): Doing your Research Project – A guide for first timeresearchersineducation,healthandsocialscience.England,OpenUniversityPress.4thEd.
	+ Danial, Wayne W and Chad L Cross (2017): Biostatistics – Basic Conceptsand Methodology for the Health Sciences – International Student Version.NewDelhi,ArEmmInternational,10thEd.

**E-LEARNINGRESOURCES**

* <https://mfs.mkcl.org/images/ebook/Fundamental%20of%20Research%20Methodology%20and%20Statistics%20by%20Yogesh%20Kumar%20Singh.pdf>
* <https://www.statisticssolutions.com/research-methodology/>
* <https://ebooks.lpude.in/library_and_info_sciences/MLIS/year_1/DLIS401_METHODOLOGY_OF_RESEARCH_AND_STATISTICAL_TECHNIQUES.pdf>
* <https://onlinecourses.swayam2.ac.in/nou21_cm03/preview>
* <https://www.udemy.com/course/research-methods-and-statistics-advanced/>

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | M | M | M | M | S | S |
| **CO2** | M | S | S | W | S | S |
| **CO3** | S | S | S | M | S | S |
| **CO4** | M | M | M | M | S | M |
| **CO5** | S | S | S | S | S | S |

**COREVII**

**OPERATIONSMANAGEMENTINFOODSERVICES**

**Time/Hours:6Hours(Theory)Credits 4**

[**CODE:**](#_bookmark2)

**Year II**

**Semester:III**

[**LEARNINGOBJECTIVES**](#_bookmark0)

[Toenablethestudentsto:](#_bookmark1)

1. [Understandconceptsofope](#_bookmark2)rationalmanagementinhotels.
2. Developcompetencyineffectiveutilizationofhumanresources.
3. Acquireskilltomanagefoodserviceoperations.

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto:**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Defineoperationsmanagement,Explainthecausesof conflict andprocedureforgrievanceanddisciplinaryaction;identifyfactorspromotingorhinderingchange;evaluatethedifferentleadershipstylesandillustratetherolesandqualitiesofaleader | **K1,K2,K3** |
| **CO2** | Describe thefactorsaffectinglocationandlayout;explainfeaturesessentialforefficientoperationofkitchen, storesandserviceareas,planlayoutsuitablefordifferentoperations | **K2,K3,K4** |
| **CO3** | Explainthelabourlawsapplicabletofoodservices,createatrainingmodule | **K2,K3,K4K5,K6** |
| forfoodserviceworkers,differentiatebetweendifferenttestsandinterviews |
| usedinselection,Describefunctionsandtypesoftraining,evaluatethedifferentmethodsofperformanceappraisal;Assessthebenefitsoffinancial |
| andnonfinancialincentives |
| **CO4** | Describethecomponentsofcost,pricingpolicyandtypesofbudget, | **K1,K2,K3K5** |
| differentiatebetweenthedifferenttypesofinventories,explaintheuses |
| of different store room and personnel records, calculate kitchenpercentageandpriceofadish,summarizethefactorsaffectingpricingand |
| suggestwaystoreduceandcontrolfood,labourandoverheadcost |
| **CO5** | Discussonworksimplificationmethods,explainmethodstoensureTQM | **K2,K3,K4K5** |
| andQWL.Determinewaystosimplifyworkinthe kitchen;summarize |
| principles ofmotion economy and Mundel‟s classes of change for worksimplification.Analysecurrentconceptsinqualitymanagement,work |
| simplification,evaluatethestrategiesforsimplifyingworkandimproving |
| productivity |
| **K1**-Remember;**K2**-Understand;**K3**-Apply; **K4**-Analyze;**K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **AdministrativeManagement**1. OperationsManagement-Definitionandtypes;functionofadministrativemanagement;supplychainmanagement-meetingcustomerneeds
2. Leadership**:**Styles,roles,qualitiesofaleader
3. Managementofconflict:causesofconflict,grievanceprocedureanddisciplinaryaction
4. Managementofchange:needforchange,factorspromotingandhinderingchange, stages inimplementingchange.
 | **10** |
| **UnitII** | **Managementofspaceforcomfort and productivity**1. Factorsaffectinglocationandlayout
2. Layoutdesignforefficientoperationandsafety:typesofkitchens,

Spaceallowancefordifferent workareas,storageandserviceareas1. Layoutofkitchen,Storageandserviceareas-Location,workflow,structuralfeatures,worksurfaces andsafetyfeatures
2. Planning for equipment, Noise control. Good lighting in different areas,Interiordécor,typesofwalls,typesofThermalcomfort(heating.cooling. air-conditioning and ventilation-IAQ Indoor air quality, IAPIndoor Air Pollution and humidity) water supply,plumbing, drainageandwastedisposalsystem
 | **25** |
| **UnitIII** | **ManagementofHumanResourcesPersonnelFunctions**1. Staffing:manpowerplanning,recruitment,selection,andplacement
2. Employee training and development- functions, types and methods oftraining.
3. Performanceappraisal-need,functions,traditionalandmodernmethodsofappraisal
4. Compensation-wagesandfringebenefits;

Personnelmaintenance-financialandnon-financialincentives**LabourLegislations**a) Labourlawsrelatingtopaymentsandworkingconditionsincateringestablishments | **25** |
| **UnitIV** | **FinancialandRecordsManagement**1. Budgets-types.
2. FixedandVariable cost,conversioncosts.Componentsofcost
3. Materialcost, Labourcostandoverheadcost;factorsaffectingcostcontrol;Foodcostpercentage,reducingcost
4. Pricing-Dish,meal,menupricing;factorsaffectingpricing,pricingpolicies
 | **20** |

|  |  |  |
| --- | --- | --- |
|  | **RecordsManagement**1. Storeroomrecords,physicalandperpetual inventories;Personnelrecords, b) use of computers in records managementManagementInformationsystem(MIS)-uses
2. Propertymanagementsystem(PMS)-useinfood service-point ofsale,computerizedaccounting
 |  |
| **UnitV** | **Qualitymanagementapproachtoproductivity**1. Worksimplification: Principlesofmotioneconomy, methodsofwork improvement; Mundel‟s classes of change for worksimplification.
2. Current conceptsinManagement-TotalQualityManagement(TQM)andQualityofWorkLife (QWL)
 | **10** |
|  |  | **90** |

**REFERENCES**

**BOOKS**

* Kotschever, L. and Terrell, M. E. (1981) Food Service planning, Layout andEquipment.John Wiley&Sons,Inc.,London
* Sethi,M.andMalhan,S.(1993) CateringManagement.AnIntegratedApproach.2nded.NewAgeInternationalPvt.,Ltd.,NewDelhi
* Payne-Palacio J and Theis M(2019) Food Service Management-Principles andPractices,13thEd.PearsonIndiaEducationServicesPvt.Ltd.Noida,India
* WestB.B,WoodL,HargerV.P.,(2006),FoodServiceinInstitutions.JohnWilleyandSons,Inc.,NewYork
* Sethi,M.(2016)InstitutionalFoodManagement,2nded.NewAgeInternationalPvt Ltd.,NewDelhi.
* MalhotraRK(2005)FoodServiceandCateringManagement,AnmolpublicationsPvtLtd.,NewDelhi
* [Barrows,](http://as.wiley.com/WileyCDA/Section/id-302477.html?query=Clayton%2BW.%2BBarrows)W.C.,Powers,TandReynolds,D.R.,(2012**),**IntroductiontoManagementintheHospitalityIndustry,JohnWileyandSons

**E-LEARNINGRESOURCES**

* + <https://www.digimat.in/nptel/courses/video/122105020/L05.html>
	+ <http://www.digimat.in/nptel/courses/video/122105020/L10.html>
	+ <https://www.youtube.com/watch?v=VXc4dnoGzoY>
	+ <https://www.youtube.com/watch?v=Ik0hHbp0ajs>
	+ [https://knowledge.leglobal.org/wp-content/uploads/sites/2/LEG-EmploymentLaw-Overview-2021-2022\_India\_27.03.21.pdf](https://knowledge.leglobal.org/wp-content/uploads/sites/2/LEG-Employment-Law-Overview-2021-2022_India_27.03.21.pdf)

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
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| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | M | S | S |
| **CO2** | S | S | S | M | S | S |
| **CO3** | S | S | S | M | S | S |
| **CO4** | S | S | S | S | S | S |
| **CO5** | S | S | S | M | S | S |

**SEMESTERIII**

**COREIX**

**COMMUNITYNUTRITION**

**CODE:**

**Time/Hours:4Hours(Theory)&2Hours(Practical)Credits 4**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

1. Learnthebasicconcept ofpublicnutrition.

**Year: IISemester:III**

1. Gainknowledgeontheprevalenceofnutritionalproblemsandcommunicablediseases prevailing in our country and reflect on suitable intervention strategies tocombatthem.
2. Getacquaintedwiththehealthcaredeliverysystemprevailing inourcountry.

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Understandthebasicconceptsofcommunitynutrition, theimportanceofbreastfeeding,weaning andanalyzethesynergismbetweennutritionandinfection | **K1,K2,K4** |
| **CO2** | Analyzethemagnitudeofnutritionalproblemsprevailinginourcountrybyapplyingappropriate assessmenttools | **K3,K4** |
| **CO3** | Developandevaluatenutritioninterventionstrategiessuitableforthenutritionalproblemsexistinginacommunity | **K5,K6** |
| **CO4** | InfertheroleofNationalandInternationalorganisationsinalleviatingmalnutrition and evaluate the use of computers in enhancing thecommunitynutrition programs | **K3,K5** |
| **CO5** | Understand the basic concepts of community health, identifyappropriatecontrolmeasurestoeradicatecommunicablediseases | **K2,K3** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply; **K4**-Analyze; **K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **Concept of Public Nutrition, Community Health and Communicablediseases**1. Introduction of nutrition to National development in terms of socio-economic,industrialandagriculturaldevelopment.

Relationship between Nutrition and Health. Sectors, programmes andpublicpoliciesrelatedtoNutritionandHealth.Millenniumdevelopmentgoals.1. Malnutrition-consequences,etiologicalfactors.Synergismbetweenmalnutrition and infection. Importance of breastfeeding and weaning toalleviate malnutrition-formulation and preparation of complementaryFoods
 | **15** |
| **UnitII** | **NutritionalProblemsandAssessmentofNutritionalStatus**1. Nutritional problems prevailing in India- PEM, Iron, iodine, Vitamin Aand B complex deficiencies, fluorosis, obesity- prevalence, etiology,clinicalmanifestations,preventiveandtherapeuticmeasures.
2. Methodsofnutritionalassessment-Directmethods-NutritionalAnthropometryandGrowthStandards.Dietaryassessment,clinicalmethods, biochemical and radiological assessment. Indirect methods-vitalstatistics,assessmentofecologicalfactors.
3. NutritionmonitoringandNutritionsurveillanceusingtechnology-objectivesandagenciesinvolvedinnutritionmonitoring.Needfornutrition surveillance and key indicators for nutrition surveillanceprogramme.
 | **25** |
| **UnitIII** | **Strategiestocombatmalnutrition**1. Feedingprogrammes-Objectivesandoperationsoffeedingprogrammes-ICDS,Mid-daymealprogramme
2. Nutrition Education- need, scope, importance and theories of nutritioneducation, process of nutrition education- formulation, implementationandevaluationandproblemsofnutritioneducationprogramme
3. Foodfortificationand enrichment-usingcurrenttechnology
4. Increasedagriculturalproductionandanimalhusbandrywithemphasisonnutritiousfoodsandnutritiongardens
5. FoodandNutritionsecurity-objectivesandprogrammes
6. Supplementationandprophylaxisprogrammes.
7. Environmentalsanitationandhealth.
8. Publicdistributionsystem.FoodforWorkProgramme
9. Case studies of selected strategies and programmes- their rationale,context,selectionofbestpossiblestrategiesbasedonaparticularsituation.
 | **20** |

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| --- | --- | --- |
| **UnitIV** | **NationalandInternationalorganisationsrelatedtonutritionandhealth,Roleofcomputersincommunitynutrition**1. NationalOrganizations-ICMR,NIN,CFTRI,ICAR-objectives,funding, policies, programmes, current projects, recent researchactivities andpublications.
2. InternationalOrganizations-WHO,FAO,CARE,UNICEF,WorldBank- objectives, funding, policies, programmes, current projects,recentresearchactivities andpublications.
3. Roleofcomputers innutritionalassessment,dietcounsellingandnutritioneducation,nutritionand dietsurveys
 | **15** |
| **UnitV** | **CommunityHealthandCommunicablediseases**1. Concept of community health- Concept of health care, levels of Healthcare, Primary Health care, Health care delivery service, Role of publicnutritionistsinhealthcaredeliverysystems.
2. Communicablediseases-Epidemic,endemicandpandemicdiseases,measurestocontrol,factorsresponsibleforcommunicablediseases-mode of transmission, preventive measures- chicken pox, malaria,typhoid,tuberculosis,filariasis, leprosy,AIDS, SARS, MERS, SARSCOV2.
 | **15** |
|  |  | **90** |

**PRACTICAL**

1. Assessmentofnutritionalstatususinganthropometry
2. Assessment ofnutritionalstatususingDietsurvey
3. Planning and preparation of programmes on significant days, like breast feedingweek,Nutrition week,WorldFoodDay.
4. Studyofthefollowingthroughvisits
	1. GovernmentSchoolLunchprogramme
	2. ICDSprogramme/Anganwaditrainingcenters
	3. PrimaryHealthcenter
5. Conduction of Nutrition Education programme using audio, visual aids and ICT tools,inacommunitytocreateawarenessonwaystoovercomenutritionalproblemsprevailinginIndia.
6. Community Nutrition programme planning- Introduction, Identification of problem,nutritionalassessment,analysisofcauses,resources,constraints,selectionofinterventions,settingastrategy,implementation,evaluationoftheprogramme

**REFERENCES**

**BOOKS**

* Food and Nutrition:What Everyone needs to Know, 2018, by P.K.Newby, OxfordUniversityPress
* Public Health and Community Nutrition, 2016, by Elizabeth Eleander, MomentumPress
* Human Nutrition: Science for Healthy living, 2021, by Thomas.J.Stephenson, McGrawHillPublishers
* A Prescription for Healthy Living:A Guide to Lifestyle Medicine, 2021,editedbyEmmaShort, AcademicPress
* Understanding Nutrition, 16th edition, 2021, Ellie Whitney and Sharon Rady Wolfes,CengageLearningPublishers
* The Future of Nutrition: An Insider's Look at the Science, Why We Keep Getting ItWrong, and How to Start Getting It Right , 2020, by [Colin Campbell.](https://www.amazon.com/T-Colin-Campbell/e/B001K7QPBA/ref%3Ddp_byline_cont_book_1)T and [NelsonDisla,](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Nelson%2BDisla&text=Nelson%2BDisla&sort=relevancerank&search-alias=books)Ben BellaBooks.
* Communicating Nutrition: The Authoritative Guide, 1st Edition, 2020, by [Barbara J.Mayfield,](https://www.amazon.com/Barbara-J-Mayfield/e/B0034PA7QA/ref%3Ddp_byline_cont_book_1)AcademyofNutritionandDietetics
* PublicHealthNutrition:Essentialsfor Practitioners 1st Edition, 2020, editedby[JessicaJones-Smith,](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&field-author=Jessica%2BJones-Smith&text=Jessica%2BJones-Smith&sort=relevancerank&search-alias=books)Johns Hopkins UniversityPress.
* Community and Public Health Nutrition, 5th edition, 2022, by Sari Edelstein, Jones &BartlettLearning
* Public Health Nutrition:Rural, Urban, and Global Community-Based Practice, 2020editedbyMargaretBarth,RonnyBell,KarenGrimmer.SpringerPublishingCompany
* NutritioninPublicHealth-Principles,Policies,andPractice,SecondEdition,2021By[ArleneSpark**,**LaurenM.Dinour**,**](https://www.routledge.com/search?author=Arlene%20Spark)[JanelObenchain**,**](https://www.routledge.com/search?author=Janel%20Obenchain)CRC Press
* Nutrition,Immunity,andInfection,1st Edition,2017,editedby[Philip C.Calder](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&field-author=Philip%2BC.%2BCalder&text=Philip%2BC.%2BCalder&sort=relevancerank&search-alias=books),[Anil](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Anil%2BD.%2BKulkarni&text=Anil%2BD.%2BKulkarni&sort=relevancerank&search-alias=books)

[D.Kulkarni,](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Anil%2BD.%2BKulkarni&text=Anil%2BD.%2BKulkarni&sort=relevancerank&search-alias=books)CRCPress

**E-LEARNINGRESOURCES**

* https://epgp.inflibnet.ac.in/
* <https://osteopathic.nova.edu/ms-nutrition/community-nutrition-resources.html>
* <https://www.publichealth.org/resources/nutrition/>
* <https://snapedtoolkit.org/resources/online-resources/nutrition-and-food/>
* <https://www.eatrightpro.org/practice/practice-resources/public-health-and-community>

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | M | S | S |
| **CO2** | S | S | S | S | S | S |
| **CO3** | S | S | S | S | S | S |
| **CO4** | S | S | S | S | S | S |
| **CO5** | S | S | S | M | M | S |

**ELECTIVEV–EXTRA-DISCIPLINARY**

**LIFESTYLEMANAGEMENT**

**CODE:**

**Time/Hours:5HoursCredits 3**

**LEARNINGOBJECTIVES**

**Year II**

**Semester:III**

1. Tointroduce thestudenttoconceptsofhealth,wellnessandfitness,providingpracticalstrategiesfor developingandmaintainingahealthylifestyle
2. Toempowerstudentstotakecontroloftheirpersonal healthandlifestyle
3. Toprovidethebasisforincorporatingphysicalactivityandotherhealthylifestylepracticesintotheirdailyroutine.

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto:**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Understandthetypesofphysical activityandExplainitsbenefitsonoverallhealthand wellbeing | **K1,K2** |
| **CO2** | Analyze thevarioushealthyeatingpatternsand toExplaintheroleofrightnutritioninhealthand fitness | **K2,K3** |
| **CO3** | Identifyvariousweightmanagementtechniquesandimportanceofbehavioralchanges inweightmanagement | **K2,K5** |
| **CO4** | Identify and analyze the stress coping strategies andpower of positiveThinking | **K3** |
| **CO5** | Understandtheimportanceof yogaforphysicalwellbeingandmentalHealth | **K3,K5** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4**-Analyze**; K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **ImportanceofPhysicalhealth andwellness**1. BenefitsofPhysicalActivity
2. DifferenttypeofExercises
3. AerobicandAnaerobicexercises
4. Exerciseforvariousdiseaseconditions ( specifythediseases)
 | **15** |
| **UnitII** | **RoleofNutrition andHealth**1. RoleofNutritioninhealth
2. ConceptofWholefoodsandplantbaseddiets
3. Foodguide pyramidandmyplate method
4. Adaptinghealthyeatingpatterns
 | **15** |
| **UnitIII** | **WeightManagement**1. Roleofnutritionandfactorsinvolvedinweightmanagement
2. BMIand healthassessment
3. Advantagesanddisadvantages ofvariousdiets
4. ImportanceofGoodsleepandRest
5. Needforbehaviouralchangeinweightmanagementgoals
 | **15** |
| **UnitIV** | **StressManagement**1. SignsandsymptomsofStress
2. Chronicstressanditseffectonmindandbody
3. DietStressrelationship
4. Stresscopingstrategies
 | **15** |
| **UnitV** | **Physicalactivity forhealthandwellbeing**1. BasicconceptsandbenefitsofYoga,Zumba,Taichi,Qigong,EFTtapping
2. Importanceofmeditationandbreathingexercises
3. PowerofPositivethinking
 | **15** |
|  |  | **75** |

**REFERENCESBOOKS**

* MirandaThewJimMcKenna.Wiley-Blackwell; 1edition(2008)
* LifestyleManagementinHealthandSocialCare.
* Conceptsandskillsforpracticaldietetics,Ananda,Sri1989.TheCompleteBookofYoga.NewDelhi: Orientpaperbacks
* Coleman,(Dr.)Vernon.(1998)StressManagementTechiniques.Bombay:IBHPublishers
* TaubAEdwardMD(1994).TheWellnessRxNewJersey,PrienticeHall
* [StephenR.Covey(1989), 7 HabitsofHighlyEffectivePeople](http://www.reviewcentre.com/reviews30502.html)
* [RichardCarlson,StopThinking,StartLiving:DiscoverLifelongHappiness](http://www.reviewcentre.com/reviews30532.html)

**E-LEARNINGRESOURCES**

* lifestylemanagment.com/importance-of-lifestyle-management/
* [(PDF)YOGAANDHEALTH(researchgate.net)](https://www.researchgate.net/publication/330555609_YOGA_AND_HEALTH)
* [YogaeBook(nih.gov)](https://files.nccih.nih.gov/s3fs-public/Yoga-eBook-2020_06_FINAL_508.pdf)
* [(PDF)StressManagement(researchgate.net)](https://www.researchgate.net/publication/273946086_Stress_Management)
* https:/[/www.he](http://www.health.harvard.edu/topics/exercise-and-fitness)a[lth.harvard.edu/topics/exercise-and-fitness](http://www.health.harvard.edu/topics/exercise-and-fitness)https://ncert.nic.in/textbook/pdf/kehe103.pdf·PDFfile

**MAPPINGOFCOWITHPSO**

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| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | M | S | W | W | W | M |
| **CO2** | S | S | M | W | W | M |
| **CO3** | S | M | M | W | W | M |
| **CO4** | S | S | W | W | W | M |
| **CO5** | S | M | M | W | W | M |

**COREINDUSTRY MODULE**

**FOODPRODUCTDEVELOPMENT**

**Time/Hours:6Hours(Theory)Credits 3**

**CODE:**

**Year: IISemester:III**

**LEARNINGOBJECTIVES**

Toenablethestudentsto

* 1. Understandandgainexperienceintheprocessoffoodproductdevelopment
	2. Gainknowledgerelatedtotheconsumerinproduct development
	3. Gaininsightintofoodproductingredienttechnology

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentwillbeableto:**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Considertheroleoffoodtrendsinthedevelopmentofnewproducts. | **K1,K2,K3** |
| **CO2** | Createafoodproductusingknowledgeoffoodingredientsandfunctionalfoods. | **K3,K6** |
| **CO3** | Createandassessaproductusingthedevelopmentprocess. | **K5,K6** |
| **CO4** | Analyseandevaluatethedesignandpackagingforfoodproducts.Assesstheproduct'squalityand sensorycharacteristics. | **K4,K5** |
| **CO5** | Describethemarketinginnovationstrategiestobeusedtoproducenewinnovative foodproducts. | **K3,K5** |
|  | **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4**-Analyze;**K5**-Evaluate;**K6**–Create |  |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **FoodNeeds&ConsumerPreference**1. Marketsurveyanditsimportancein:designingaquestionnairetofindconsumerneedsforaproductoraconcept.
2. DevelopingaProducttoMeettheRequirements.Productlifecycle.CreatingbrandvaluefortheProduct.TheSWOTanalysis
 | **15** |
| **UnitII** | **DesigningNewProducts**1. NewFoodProductDevelopment(NPD)processandactivities, The Stage-Gate model NPD success factors, new productdesign,foodinnovationcasestudies,market-orientedNPDmethodologies,organization forsuccessfulNPD
2. RecipeDevelopment;useoftraditionalrecipeandmodification;involvementofconsumers,chefsandrecipeexperts;selectionofmaterials/ingredients for specific purposes; modifications forproductiononlargescale,costeffectivenessandreturnoninvestment,nutritionalneedsoruniqueness;useofnovelfoodingredientsandnovelprocessingtechnologies.
 | **20** |
| **UnitIII** | **Standardization&Large-ScaleProduction**1. Process design, equipment needed; establishing process parameters foroptimumquality
2. Sensory Evaluation; Lab requirements; different techniques and tests;statistical analysis; application in product development and comparisonof market samples; stages of the integration of market and sensoryanalysis.
 | **25** |
| **UnitIV** | **Quality,Safety&RegulatoryAspects**1. Product Stability; evaluation of shelf life; changes in sensory attributesandeffectsofenvironmentalconditions;acceleratedshelflifedetermination; developing packaging systems for maximum stabilityandcosteffectiveness;interaction ofpackagewithfood.
2. Regulatory Aspects for safety and quality; whetherproductconformstostandards;ApprovalforProprietaryProduct.
 | **15** |
| **UnitV** | **ProductCommercialization,Launch,Evaluation&CaseStudies**1. Outcomes and activities in product commercialization, Pre-launch trial,Stepsinproductlaunch,EvaluationoftheLaunch,productperformancetesting,developingtestmarketstrategies,
2. Case Studies of some successes and failures, food choice models andnewproducttrends.
 | **15** |
|  |  | **90** |

**REFERENCESBOOKS**

* + - JacquelineH.Beckley,M.MicheleFoleyElizabethJ.Topp&\_J.C.HuangWitoon

Prinyawiwatkul(2007).AcceleratingNewFoodProductDesignandDevelopment.BlackwellPublishingCompany.IFTPress.USA

* + - HowardR.Moskowitz,I.SamSaguy&TimStraus(2009).AnIntegratedApproachtoNewFoodProductDevelopment.TaylorandFrancisGroup,LLC.USA
		- Mary Earle and Richard Earle (2008). Case studies in food product developmentWoodheadPublishingLimitedandCRCPressLLC.USA
		- CreatingNewFoods.TheProductDeveloper'sGuide:MarieD.EarleandRichardL.Earle(2001).ChadwickHouseGroupLtd.NewZeeland.
		- David H. Lyon, Mariko A. Francombe, Terry A. Hasdell and Ken Lawson (1992).Guidelinesforsensoryanalysisinfoodproductdevelopmentandqualitycontrol.
		- Chapman&Hall,2-6BoundaryRow,London.

**E-LEARNINGRESOURCES**

* https:/[/www.a](http://www.academia.edu/1990616/New_food_product_development_from_concept_to_marketp)c[ademia.edu/1990616/New\_food\_product\_development\_from\_concept\_to\_marketp](http://www.academia.edu/1990616/New_food_product_development_from_concept_to_marketp)lace
* [http://154.68.126.6/library/Food%20Science%20books/batch1/Functional%20Food%20Product%](http://154.68.126.6/library/Food%20Science%20books/batch1/Functional%20Food%20Product%25)20Development.pdf
* https:/[/www.r](http://www.researchgate.net/publication/259054153_New_Food_Product_Development)e[searchgate.net/publication/259054153\_New\_Food\_Product\_Development](http://www.researchgate.net/publication/259054153_New_Food_Product_Development)
* https:/[/www.destechpub.com/wp](http://www.destechpub.com/wp-content/uploads/2015/01/Methods-for-Developing-New-Food-)-[content/uploads/2015/01/Methods-for-Developing-New-Food-](http://www.destechpub.com/wp-content/uploads/2015/01/Methods-for-Developing-New-Food-)Products-preview.pdf
* https://nzifst.org.nz/resources/foodproductdevelopment/Chapter-3.htm

**MAPPINGOFCOWITHPSO**

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| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | M | M | M | M | S | S |
| **CO2** | M | M | M | S | S | S |
| **CO3** | S | S | M | M | M | M |
| **CO4** | M | M | M | M | S | S |
| **CO5** | M | M | S | S | S | S |

**SOFT SKILL 3 - ICTtoolsforNutritionEducation**

**Semester - III YEAR – II CREDIT – 2**

|  |  |
| --- | --- |
| **LearningObjectives** | Thecourseaimsto* Createawarenessamongpeoplewithadvertisement.
* Developthetoolsfornutritioneducation.
 |

## UnitIICTinNutritionEducation

ICT in Nutrition Education a) Nutrition Education- Nature and Importance to the Community,Objectives,TrainingWorkersinNutritionEducation,andExtensionWork.

ICTtoolsto include-Printedmedia(Newspaper,books,journalmagazines)-

## UnitIIPrinciplesofnutritioneducation

Information and communication devices for making learning in food and Nutrition education:concepts.Develop nutritionalmessages/sloganon health andnutritionissuesfor vulnerablegroupsinthecommunity.

## UnitIIINutritioneducationtools

Development of nutritional games on health and nutrition issues for vulnerable groups in thecommunity, chart,poster,leaflet,flipbook/flashcard.

## Unit-IVDifferentaudiovisualaidsinnutritioneducation

Audio-Videomessagesthroughmobilephones,mobileapps,alertcallsregardingnutritionaluptake of rural mass and regular health checkups.

## UnitVNutritionalinterventionthroughICT

Mobilebasednutritionalawareness:nutrifyIndia,DietaryguidelinesforIndians,Nutritionatlas,vikaspedia,blogcreationonlinedietcounselling:scopeandimportance.

## References

1. Suryatapadas–TextbookofCommunityNutrition,AcademicPublishers,2016.
2. PrabhaBisht-CommunityNutritioninIndia,StarPublications,2017.
3. B.Srilakshmi-NutritionScience,NewAgeInternational,2006
4. Swaminathan.M-AdvancedTextbookonFood&NutritionVol1&2,Bappco.
5. Hyun, Taisun,Miyong Yon,Sun Hee Kim, Nan Hee Kim, Suk Mi An,Sun Mi Lee, HyunJung Chi et al. "Development of a nutrition education website for children." *Korean Journal ofCommunityNutrition*8,no.3(2003):259-269.
6. BhattD.P,HealthEducation,KhelSahityaKendra,NewDelhi,2008.

## COURSEOUTCOMES

Onsuccessfulcompletionofthecourse,thestudentswillbeabletogainknowledgeabout

|  |  |  |
| --- | --- | --- |
| K2 | CO1 | Variousconceptsofnutritioneducation |
| K3 | CO2 | ICTsignificancenutritioneducation |
| K4 | CO3 | Differenttoolsinnutritioneducation |
| K2 | CO4 | Contentmakingfornutritionalandhealthissues |
| K3 | C05 | Creationofmobileapps,videos,onlinecounselling |

**MappingofCoswithPOS&PSOs:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO/P****O** | **PO1** | **PO2** | **PO****3** | **PO****4** | **PO5** | **PO****6** | **PO****7** | **PSO****1** | **PSO****2** | **PSO****3** | **PSO****4** | **PSO****5** |
| CO1 | M | S | M | M | S | M | M | M | S | M | S | M |
| CO2 | M | S | M | M | S | M | M | M | S | M | S | M |
| CO3 | M | S | M | M | S | M | M | M | S | M | S | M |
| CO4 | M | S | M | M | S | M | M | M | S | M | S | M |
| CO5 | M | S | M | M | S | M | M | M | S | M | S | M |

**DIETETICINTERNSHIP**

**CODE:**

**Duration:15-30 Daysminimum Semester : IIICredits :2**

The students are expected to undergo a dietetic internship for a minimum of 15 days at anyreputedhospitalthat has aDietaryDepartmentoperatedbyRegisteredDietitians.

**OBJECTIVE:** The Internship is committed to preparing graduates in the M.Sc. FoodService Management and Dietetics Degree to join as entry level dietitians with a strongfoundation inthetheoryand applicationofmedicalnutritiontherapy.

**EXPECTEDOUTCOMEOFTHEINTERNSHIP**

**Onsuccessfulcompletionoftheinternship,thestudent:**

* Learns how a dietary department functions and the specific roles andresponsibilitiesofadietitian.
* Developsskills innutritionscreeningandassessment
* Acquirestraininginnutritiondiagnosesofeachpatientassessed
* Acquirestraininginpreparationofenteralformulafeeds.
* Demonstrates theability to implement nutrition care plans; documentnutritioncare provided maintain internship logbook and monitor outcomes of the nutritionplan
* Displaysfamiliaritywiththeuseofstandardizedterminologyindocumentation.
* Demonstratescompetencyinprofessionalpresentation,communicationandwritingskills.
* Acquirestrainingindietcounselling,onlinecounsellingand groupcounselling
* Is trained in the preparation and presentation of case studies/short communicationsforpublication

**EVALUATION**

Internship willbe carried out during the summer vacation after the second semesterand the intern will be evaluated at the hospital on a continuous assessment basis, whilethe report submitted by the student will be evaluated by two examiners: one fromwithinthehospitalandonefromthecollegeorinstitutiontowhichthestudentbelongs.

**SEMESTERIV**

**COREXIII**

**PAPERXVII–ENTREPRENEURIALDEVELOPMENT**

**Time/Hours:6Hours(Theory)Credits 4**

**CODE:**

**Year II**

**Semester:IV**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

1. Understandbasicconceptsinentrepreneurship.
2. AcquireknowledgeaboutthevariousEntrepreneurialdevelopmentagencies.
3. Adoptkeystepsintheelaborationofbusinessideas.
4. UnderstandmajorstepsinvolvedinsettingupaSmall-ScaleUnit.
5. HighlighttheLegislationprocessandLaborLawsApplication.

**COURSEOUTCOMES**

**Onsuccessfulcompletionofthecoursethestudentswillbeableto**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Discerndistinctentrepreneurialtraits. | **K1,K2,K3** |
| **CO2** | Explain business idea generation techniques, Evaluate parameters to assessopportunities and constraints for new business ideas and device a businessplan.Discuss ownershipsand SHG | **K2,K5** |
| **CO3** | Explainfinancial,workingcapitalandmarketingmanagement | **K4,K6** |
| **CO4** | Identify and include Major steps involved in setting up a Small-ScaleUnitElaborateExportMarketing procedures& formalitiesandlearnaboutPatents&IPRs | **K2, K3,K4** |
| **CO5** | AnalyzeLegislationprocessandexplaintheLaborLawsApplication | **K3,K5** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply; **K4**-Analyze; **K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **No ofhours** |
| **UnitI** | **Entrepreneurship–Basicconcepts**Entrepreneurship–Definition,Importance,ChallengesanditsrelevanceincareergrowthStartupsIndia–IncubationCentre-Digitalentrepreneurship&SocialentrepreneurshipEntrepreneur-MeaningandCharacteristics | **20** |
| **UnitII** | **BusinessIdeaandSelf-HelpGroups**Business Idea Generation Techniques–Identification of BusinessOpportunitiesOwnership-partnership,soleproprietorship,franchise,cottageindustries,self-employmentSHG–Meaning, ImportanceandGovernmentAssistance | **20** |

|  |  |  |
| --- | --- | --- |
| **UnitIII** | **FinancialandMarketingManagement**FinancialManagement-BooksofAccounts,FinancialStatements,WorkingCapitalManagement–Factorsand sources,Break-EvenAnalysisMarketing Management- Marketing Mix- Product, Promotion, Place &Price | **20** |
| **UnitIV** | **SettingupaSmall-ScaleUnit**Majorstepsinvolved insettingupaSmall-ScaleUnitFinancialsupportfromFinancialInstitutes-National level -NBMSME, KVIC, DC-MSME, NSIC, NSTEDB, EDI, NI-MSME,NIESBUD,IIE,NABARDStatelevel-DIC,SFC,SIDC,SIADB,SIDBIExport Marketing- procedures & formalitiesInventoryManagement&TQM-BasicconceptsPatents& IPRs | **15** |
| **UnitV** | **LegislationFormalities**Legislation-Licensing,Registration,MunicipalLaws,BusinessEthicsLaborLawsApplicationConsumerComplaintsandRedressalTax–GSTanditsimplications | **15** |
|  |  | **90** |

**REFERENCES**

**BOOKS**

* Saravanavel,(2005), EntrepreneurialDevelopment,Ess Pee Key PublishingHouse,Chennai
* VasantDesai,(2004),ProjectManagement,HimalayaPublishingHouse.
* Holt(2009),Entrepreneurship, Newventurecreation.
* S.SainiandS.K.,Dhameja,(2011),EntrepreneurshipandSmallBusinessRawartNewDelhi.
* C.Jain,(2012),HandbookforNewEntrepreneurs,OxfordUniversityPress.

**E-LEARNINGRESOURCES**

* <http://www.ddegjust.ac.in/studymaterial/mba/cp-401.pdf>
* <https://ecestudy.files.wordpress.com/2015/02/theories-of-entrepreneurship.pdf>
* <http://www.bimkadapa.in/materials/ED-5-UNITS-PDF.pdf>
* [https://www.theseus.fi/bitstream/handle/10024/115894/Laamanen\_Pirita.pdf?sequence](https://www.theseus.fi/bitstream/handle/10024/115894/Laamanen_Pirita.pdf?sequence=1&isAllowed=y)

[=1&isAllowed=y](https://www.theseus.fi/bitstream/handle/10024/115894/Laamanen_Pirita.pdf?sequence=1&isAllowed=y)

* <https://bbamantra.com/preparation-of-a-business-plan/>
* <https://courses.lumenlearning.com/boundless-business/chapter/introduction-toentrepreneurship>2.[http://www.rroij.com/open-access/women-entrepreneurs--problems-ofwomenentrepreneurs-.php](http://www.rroij.com/open-access/women-entrepreneurs--problems-ofwomen%20entrepreneurs-.php)?aid=48589–[3.http://www.mbae](http://www.mbaexamnotes.com/business_idea.html)xa[mnotes.com/business\_idea.html](http://www.mbaexamnotes.com/business_idea.html)
* <https://www.businessstudynotes.com/finance/project-management/types-feasibility>

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | M | W | M | W | M | S |
| **CO2** | M | S | S | S | S | S |
| **CO3** | M | M | M | M | S | S |
| **CO4** | M | M | S | M | S | S |
| **CO5** | M | S | S | S | S | S |

# SEMESTER III SEC-3

**SCIENTIFICWRITINGANDPRESENTATIONSKILLS**

#  CODECREDITS: 2

**COURSEOBJECTIVES**

* + Togainknowledgeinscientificwritingandpresentationskill.
	+ Tounderstandtheprinciplesfororalpresentations.
	+ Togainindepthknowledgeonresearchpaperpublication

# COURSEOUTLINE

**UNITI:** Scientificwriting-abstract,fullpaper,clinicalupdate,manuscripts.Process of copyeditingjournals

**UNITII:** Presentationskills–Thematic,poster,oral,principlestobefollowedfor presentation

**UNIT III:** Computerapplicationforresearch

UseofInternetinResearch–Websites,searchEngines,E-journal and E-Library – INFLIBNET, SHODHGANGAPlagiarism–Citationandacknowledgement–reproducibilityandaccountability,Softwaresavailableinthemarketforplagiarism

# RECOMMENDEDTEXTBOOKS

1. BestJWandKahnJV,*ResearchinEducation*,7thEdition,PrenticeHallofIndiaPvt.Ltd.,New Delhi,2000.
2. CampbellWG,*FormandstyleinThesiswriting*,HoughtonMifflinCompany,Boston.

# REFERENCEBOOKS

1. KoulL,MethodologyofEducationalResearch,3rdedition,VikasPublishingHousePvt.Ltd,New Delhi
2. JohnW.BestandJamesV.Kahn,ResearchinEducation,7thEed,PrenticeHallofIndiaPvt. Ltd, NewDelhi, 2000.
3. Elhance.D.NVeenaandElhanceandAgarwal.B.M,FundamentalsofStatistics,48thed, Kitab mahal, Allahabad, 2005.
4. SadhuAN,AmarjitSingh,ResearchmethodologyinSocialSciences.HimalayaPublishingHouse, gurgoan, Mumbai, 1992.

# JOURNALS

1.Journalofacademicwriting

# E-LEARNINGRESOURCES

**CourseOutcome**

|  |  |  |
| --- | --- | --- |
| CONo | COstatement | Knowledgelevel |
| CO1 | Developaframeworkforscientificwriting. | K1 |
| CO2 | Describe,CompareandInterpretvariousmeansforposter,oralpresentationand copyediting. | K2, K4,K5 |
| CO3 | Evaluatetheuseofwebsites,searchengine,E-journalsandE-library for research | K5 |
| CO4 | Proposetheauthenticityoftheresearcharticleusingplagiarismchecking software. | K6 |

# MappingofCOwith PSO

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
| CO1 | 3 | 3 | 3 | 1 | 3 | 1 |
| CO2 | 3 | 3 | 3 | 3 | 1 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 1 | 1 |
| CO4 | 3 | 3 | 3 | 3 | 1 | 1 |
| AVERAGE | 3 | 3 | 3 | 2.5 | 1.5 | 1.25 |

KEY:**S**TRONGLY CORELATED-3 **M**ODERATELY CORELATED-2**W**EAKLYCORELATED-1**N**OCORELATION-0

**CORE XI**

**HOSPITALADMINISTRATION**

**Time/Hours:5HoursCredits 4**

**Year IISemester:IV**

**LEARNINGOBJECTIVES**

**Toenablethestudentsto**

* 1. Learnaboutthedifferenttypesofhospitalsandtheiradministration
	2. Gainknowledgeabouttheethicsandstandardsfollowedinhospitals
	3. Getfamiliarwithhealthcarepoliciesand communityhealthmanagement

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecourse,thestudentwillbeableto:**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Distinguishbetweenthetypesofhospitalsandthedepartmentsandtheir organizationalstructure | **K1,K2** |
| **CO2** | Describe the code of ethics followed in hospitals and Explaintherolesand responsibilitiesofhealthprofessionals | **K1,K2** |
| **CO3** | Recalllegal lawsandidentifymedical malpractices andEvaluatethequalityandsafetyin hospitalsthroughuseofappropriatemeasures | **K3,K5** |
| **CO4** | Analyzethebudgetingandfundflowmanagementinhospitals | **K4** |
| **CO5** | DiscusstheNationalHealthpolicyandcommunitybasedhealthdevelopmentinruralareas | **K3,K5** |
| **K1**-Remember; **K2**-Understand;**K3**-Apply;**K4** -Analyze;**K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |
| --- | --- |
| **S.No** | **CONTENT** |
| **UnitI** | **IntroductiontoHospitalAdministration**ConceptofHospitals-DifferenttypesofHospitals-ProblemsandconstraintsindifferenttypeofHospitals-HistoryofHospitalDevelopment - Departmentation and organization structure of differenttypesofhospitals. |
| **UnitII** | **CodeofEthics**DutiesofHealthcareprofessionals-Doctors,Nurses,NutritionistsandDietitians(inbrief)totheirpatients,professionatlarge,professioninconsultation and to thecommunity–Breach ofethics andcodeofconduct. |
| **UnitIII** | **Legalframeworkin Hospitals**Patient‟srights&provider‟sresponsibility-MedicalMalpractices.Disciplinary Action; Management of Hazard and Safety in a HospitalSetup.Bio-MedicalWasteManagement–BenefitsofHealthInsurance and Managing Health Care - Medical audit to meet legalrequirementsofHospitals |
| **UnitIV** | **AccountingandfinancialManagementinHospitals**1. Principles,analysisandinterpretationoffinancialreports,
2. Preparationanduseofbudgets
3. Capitalbudgeting,Fundflowmanagementandbudgetarycontrol
 |
| **UnitV** | **HealthPlanning&Management**National Health Policy - Provision of medical care – Primary healthcare –HealthforAll.Encouragementofindigenoussystemsofmedicine-ProcessofhealthplanninginIndia. |
|  |  |

**REFERENCES**

**BOOKS**

* Davidson S.R.andPassmore J.F., 1975, HumanNutritionandDieteics.Vol.I,IIEdition.
* Francis,C.MandD‟Souza,M.C.,2000,HospitalAdministration.JayBrothers.
* GillespieS.McNeiG.,1992,HospitalManagementMacmillanandCo.,NewYork.
* Mitchelletal.,1987,NutritioninHealth&disease,PitmanM.Edu.PublishingCo.
* Robinsonet.al.,1986,NormalandTherapeuticNutrition.MacmillanCo.,NewYork.

**E-LEARNINGRESOURCES**

* [www.ingenta.connect.com-](http://www.ingenta.connect.com-/)FoodandFoodways.
* [www.](http://www/)fda.gov/search.html
* [www.wodswrth.com/nutrition](http://www.wodswrth.com/nutrition)
* [www.elsevier.com-](http://www.elsevier.com-/) IndianJournalofNutritionandfoodmicrobiology.

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | M | S | S | M | M |
| **CO2** | S | M | S | S | M | M |
| **CO3** | S | M | S | W | M | M |
| **CO4** | S | M | S | W | M | M |
| **CO5** | S | M | S | S | S | S |

**COREXII**

**DISSERTATION**

**CODE:**

**Time/Hours:7Hours(Fieldwork) Year II**

**Credits : 4 Semester:IV**

**LEARNINGOBJECTIVES**

Toenablethestudentto:

1. Developskillsinconductingaresearchstudy
2. Learntheartandscienceofpreparingandpresentingaresearchdocument.

**COURSEOUTCOMES**

**Onsuccessfulcompletionofthecourse,thestudentwillbeableto:**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | Developaresearchdesignonatopicrelevanttotheirfield | **K1,K2,K3, K4,K5,K6** |
| **CO2** | Prepareasystematicliteraturereviewonthetopicselected | **K2,K3,K4,K5** |
| **CO3** | Select and execute the most appropriate methodology for the studyandprovidejustificationforthechoicemade. | **K2,K3,K4, K5,** |
| **K6** |
| **CO4** | Acquireskillincollecting, analyzing,presentingandinterpretingdataaccurately. | **K3,K4,K5,K6** |
| **CO5** | Present findings of the study in a logical and sequential manner anddiscuss them against a backdrop of available scientific literature;Citereferences in prescribed format and conduct plagiarism check onthedocumentprepared. | **K2,K3,K4,K5,K6** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply; **K4**-Analyze; **K5**-Evaluate;**K6**–Create |

**COURSEOUTLINE:**

Thestructureofthedissertationincludes

**Unit1:**Introduction

**Unit2:**ReviewofLiterature

**Unit3:**Methodology

**Unit4:**Results and Discussion

**Unit 5:**SummaryandConclusion, Bibliography

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | S | S | S | S |
| **CO2** | S | S | S | S | S | S |
| **CO3** | S | S | S | S | S | S |
| **CO4** | S | S | S | S | S | S |
| **CO5** | S | S | S | S | S | S |

**Time/Hours:5HoursCredits 3**

**ELECTIVE VI -**

**FOODPRESERVATION**

**CODE:**

**Year II**

**Semester:IV**

**LEARNINGOBJECTIVES**

**Toenablestudentsto**

1. Learnthebasicconceptsand importanceofFoodPreservation
2. UnderstandthedifferentmethodsofFoodPreservation
3. Chooseappropriatefood handlingandstoragetechniques

**COURSEOUTCOME**

**Onsuccessfulcompletionofthecoursethestudentswillbeableto:**

|  |  |  |
| --- | --- | --- |
| **CO** | **COSTATEMENT** | **KLEVEL** |
| **CO1** | DescribethebasicconceptsandprinciplesofFoodPreservation. | **K1,K2,K3** |
| **CO2** | Identify the best methods of storage of different foods based on theirshelflife.Recommendappropriatepostharvesttechnologyproceduresthatincreaseshelf lifeoffood | **K2,K4** |
| **CO3** | Analyzetheuseoflowandhightemperaturetopreservefoodandidentifythe appropriatemethodtopreservedifferentfoods | **K4,K5** |
| **CO4** | Discussthe useand effectsofdifferentpreservativesonthequalityoffoods | **K4** |
| **CO5** | Appreciatetheuseofmoderntechnologyinfoodpreservationandmanagingfoodwastage. | **K3,K5** |
| **K1**-Remember;**K2**-Understand;**K3**-Apply;**K4**-Analyze;**K5**-Evaluate;**K6**–Create |

**THEORY**

|  |  |  |
| --- | --- | --- |
| **S.No** | **CONTENT** | **Noofhours** |
| **UnitI** | **IntroductiontoFoodPreservation**1. Concept,importanceoffoodpreservation.
2. Commontermsusedinfoodpreservation.
3. Classificationoffoodonthebasisofstorage,pHvalue,moisturecontent.
4. DifferentmethodsandPrinciplesofpreservation.
 | **15** |
| **UnitII** | **PreservationbyLowTemperature**1. UseofColdandRefrigeratedStorage
2. UseofFreezingtemperatures:Slowand fastfreezingoffoodsandCryogenicfreezingoffoods,dehydrofreezing
3. Frozenstorage andthawingoffoods
 | **15** |
| **UnitIII** | **PreservationbyHighTemperature**1. Preservationoffoodsbyhightemperatures:Basic conceptsinthermal destruction of microorganisms- Heat resistant andthermophilicmicroorganisms.
2. Cooking,Blanching,PasteurizationandSterilizationoffoods.
3. Generalprocessofcaningoffoods
4. Spoilageincannedfoods.
 | **15** |
| **UnitIV** | **PreservationbyDrying**1. Principlesandapplicationofdryinganddehydrationoffoods
2. Differenttypesofdryinganddryers.
3. Treatmentspriortodrying
4. Freezedryingoffoods.
 | **15** |
| **UnitV** | **PreservationbyPreservatives**1. Typesofpreservatives-NaturalandArtificial:Modeofactionofdifferentpreservatives
2. Preservationbyionizingradiations,fermentation,curing,pickling,smoking.
3. Applicationoftraditionalandmodernfoodpreservationtechniques
 | **15** |
|  |  | **75** |

**REFERENCES**

**BOOKS**

* PrakashTriveni(2010):FoodPreservation,AadiPublication,Delhi.
* M.ShafiurRahman(2007):HandBookofFoodPreservation,MarcelDekkerInc,Newyork.
* McWillimsandPaine(2009) :ModernFoodPreservation, SurjeetPublications
* Karnal,MarcusandD.B.Lund(2003)“PhysicalPrinciplesofFoodPreservation”.Rutledge.
* VanGarde,S.J.and Woodburn. M(2001)“Food Preservation andSafetyPrinciplesandPractice”.SurbhiPublications
* Sivasankar,B(2002).“FoodProcessing&Preservation”,PrenticeHallofIndia
* Khetarpaul,Neelam(2005)“FoodProcessingandPreservation”,DayaPublications
* Norman N.Potter,JosephH.Hotchkiss:Foodscience,5thed.NewYork:Chapman&Hall

**E-LEARNINGRESOURCES**

* https://www.embibe.com/food-preservation/
* <https://agripathshala.com/lessons/principles-of-food-preservation>
* [www.onlinebiologynotes.com/food-preservation-from-microbial-spoilage-principles](http://www.onlinebiologynotes.com/food-preservation-from-microbial-spoilage-principles)
* <https://www.researchgate.net/publication/347909697_FOOD_PRESERVATION>

**MAPPINGOFCOWITHPSO**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | **PSO6** |
| **CO1** | S | S | M | M | M | M |
| **CO2** | S | S | M | M | M | M |
| **CO3** | S | S | M | M | M | M |
| **CO4** | S | S | M | M | M | M |
| **CO5** | S | S | M | M | M | M |