Study & Evaluation Scheme of Bachelor of Science in Nutrition & Dietetics

[Applicable for 2022-25]

Version 2022

[As per CBCS guidelines given by UGC]

Approved in BOS	Approved in BOF	Approved in Academic Council
31/05/2022	08/08/2022	20/10/2022 vide agenda No. 8.4.5

Quantum University, Roorkee
22 KM Milestone, Dehradun-Roorkee Highway, Roorkee (Uttarakhand)
Website: www.quantumuniversity.edu.in

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22 KM Milestone, Dehradun-Roorkee Highway, Roorkee (Uttarakhand)

Study & Evaluation Scheme

Study Summary

Name of the Faculty	Faculty of Health Sciences
Name of the School	Quantum School of Health Sciences
Name of the Department	Department of Applied Medical Sciences
Program Name	Bachelor of Science in Nutrition & Dietetics
Duration	3 Years
Medium	English

Evaluation Scheme

Type of Papers	**Internal Evaluation (%)**	**End Semester Evaluation (%)**	**Total (%)**
Theory	40	60	100
Practical/ Dissertations/Project Report/ Viva-Voce	40	60	100
Internal Evaluation Components (Theory Papers)			
Mid Semester Examination	60 Marks		
Assignment –I	30 Marks		
Assignment-II	30 Marks		
Attendance	30 Marks		
Internal Evaluation Components (Practical Papers)			
Quiz One	30 Marks		
Quiz Two	30 Marks		
Quiz Three	30 Marks		
Lab Records/ Mini Project	30 Marks		
Attendance	30 Marks		
End Semester Evaluation (Practical Papers)			
ESE Quiz	40 Marks		
ESE Practical Examination	40 Marks		
Viva- Voce	20 Marks		

Structure of Question Paper (ESE Theory Paper)

The question paper will consist of 5 questions, one from each unit. Student has to Attempt all questions. All questions carry 20 marks each. Parts a) and b) of question Q1 to Q5 will be compulsory and each part carries 2 marks. Parts c), d) and e) of Q1 to Q5 Carry 8 marks each and the student may attempt any 2 parts.

Important Note:

1. The purpose of examination should be to assess the Course Outcomes (CO) that will ultimately lead to attainment of Programme Specific Outcomes (PSOs). A question paper must assess the following aspects of learning: Remember, Understand, Apply, Analyze, Evaluate &Create (reference to Bloom's Taxonomy). The standard of question paper will be based on mapped BL level complexity of the unit of the syllabus, which is the basis of CO attainment model adopted in the university.

2. Case Study is essential in every question paper (wherever it is being taught as a part of pedagogy) for evaluating higher-order learning. Not all the courses might have case teaching method used as pedagogy.

3. There shall be continuous evaluation of the student and there will be a provision of real time reporting on QUMS. All the assignments will be evaluated through module available on ERP for time and access management of the class.

Program Structure – Bachelor of Science in Nutrition & Dietetics

Introduction

Bachelors in Science Nutrition & Dietetics syllabus is broad and multidisciplinary consists of various courses in Human Physiology, Nutritional Biochemistry, Food Science, Fundamentals of Foods & Nutrition, Food Microbiology, Dietetics, Sports Nutrition, Food Technology, Food Preservation & Bakery etc.

The BSc Nutrition & Dietetics subjects are designed in such a way that students grasp all the knowledge related to foods and nutrition science. Towards enhancing employability and entrepreneurial ability of the graduates, the Quantum University increases the practical content in the courses, wherever necessary. The total number of credit hours in 6 semesters including Student READY programme will range from 147 to 156. In order to harness regional specialties and to meet region-specific needs, Quantum University modifies the content of syllabus as per the regional and global demands. The Quantum University is offering the specializations like majoring in Food science, Sports Nutrition, Nutraceuticals, and Research etc.

HOSPITAL INTERNSHIP

This is offered after the 4th Semester to the students to gain the practical exposure (minimum 45 days) of the work that is carried out in hospital like formation of RT Feed, preparation of Therapeutic Diets, Counseling sessions in OPD patients and Counseling of critical patients etc.

The students would be required to record their observations in the hospital on daily basis and will prepare their internship report based on these observations and will complete 1-2 case studies.

BREAKUP OF COURSES

Sr. No	CATEGORY	CREDITS
1	Foundation Core (FC)	24
2	Program Core (PC)	90
3	Program Electives (PE)	09
4	Open Electives (OE)	09
5	Seminar	02
6	Hospital Internship	03
7	Value Added Programs (VAP)	09
8	GP	05
9	Passion Programs (PROPs)*	04*
10	Disaster Preparedness & Management*	02*
	TOTAL NO. OF CREDITS	151

*Non-CGPA Audit Course

DOIAN WISE BREAKUP OF CATEGORY

CATEGORY	FC	PC	PE	Total	%
Sciences	24	90	09	123	82.8
Open Elective				09	6.16
Seminar				02	1.36
Hospital Internship				03	2.05
VAPs				09	4.10
GP				05	3.42
Passion Programs (PROPs)*				04*	-
Disaster Preparedness & Management*				02*	-
TOTAL				151	100

*Non-CGPA Audit Course

SEMESTER-WISE BREAKUP OF CREDITS

Sr. No	CATEGORY	SEM1	SEM 2	SEM 3	SEM 4	SEM 5	SEM 6	TOTAL
1	Foundation Core	19	1	1	-	-	-	24
2	Program Core	-	19	21	21	18	14	90
3	Program Electives	-	-	-	-	3	6	09
4	Open Electives	-	3	3	3	-	-	09
5	VAPs	1	2	2	2	2	-	09
6	Seminar	-	-	-	-	-	2	02
7	Hospital Internship	-	-	-	-	3	-	03
8	GP	1	1	1	1	1	-	05
9	PROPs*	-	-	-	-	-	-	04*
10	Disaster Preparedness & Management*	-	2	-	-	-	-	02*
	TOTAL	21	26	28	27	27	22	151

*Non-CGPA Audit Course

Minimum Credit Requirements:

Bachelor of Science (Nutrition & Dietetics): 151credits

SEMESTER 1

Course Code	Category	COURSE TITLE	L	T	P	C	Version	Course Prerequisite
RD3106	FC	Basics of Human Physiology I	3	0	0	3	1.0	Nil
ND3102	FC	Fundamental of Foods and Nutrition I	4	0	0	4	1.0	Nil
ND3105	FC	Biochemistry	3	0	0	3	1.1	Nil
ND3104	FC	Food, Hygiene and Sanitation	3	0	0	3	1.0	Nil
CY3205	FC	Environmental Studies	2	0	0	2	1.0	Nil
RD3143	FC	Basics of Human Physiology I Lab	0	0	2	1	1.0	Nil
ND3141	FC	Fundamental of Foods &Nutrition I Lab	0	0	4	2	1.0	Nil
ND3144	FC	Biochemistry Lab	0	0	2	1	1.0	Nil
VP3101	VP	Communication & Professional Skills I	0	0	2	1	1.0	Nil
GP3101	GP	General proficiency	0	0	0	1	1.0	Nil
		TOTAL	**15**	**0**	**10**	**21**		

Contact Hours- 25 hours

SEMESTER 2

CourseCode	Category	COURSE TITLE	L	T	P	C	Version	Course Prerequisite
RD3206	PC	Basics of Human Physiology II	3	0	0	3	1.0	Nil
ND3203	PC	Nutrition Through Lifecycle	4	0	0	4	1.0	Nil
ND3206	PC	Nutritional Biochemistry	4	0	0	4	1.0	Nil
ND3205	PC	Fundamental of Foods & Nutrition II	3	0	0	3	1.0	Nil
CE3102	FC	Disaster Preparedness & Management*	2	0	0	2*	1.0	Nil
RD3243	PC	Basics of Human Physiology Lab II	0	0	2	1	1.0	Nil
ND3242	PC	Nutrition through life cycle Lab	0	0	4	2	1.0	Nil
ND3244	PC	Fundamental of Foods and Nutrition II Lab	0	0	2	1	1.0	Nil
ND3245	PC	Nutritional Biochemistry Lab	0	0	2	1	1.0	Nil
VP3201	VP	Communication & Professional Skills II	2	0	0	2	1.0	Nil
GP3201	GP	General Proficiency	0	0	0	1	1.0	Nil
	OP	Open Elective I	3	0	0	3	1.0	Nil
HU3201	FC	Indian Knowledge System	1	0	0	1	1.0	
		TOTAL	20	0	10	26		

***Non-CGPA Audit Course Contact Hours = 30**

OPEN ELECTIVE I

S.No	Code	Name	Department (Offering)
1	CE3011	Carbon Emission& Control	Civil engineering
2	CS3011	HTML5	Computer Science and engineering
3	CS3021	Mining and Analysis of Big data	Management + CSE
4	AG3011	Ornamental Horticulture	Agriculture
5	BB3011	Entrepreneurial environment in India	Business & Management
6	JM3011	Media Concept and Process (Print and Electronic)	Journalism
7	HM3011	Indian Cuisine	Hospitality & Tourism
8	MB3011	SAP 1	Management
9	EG3011	French Beginner A1	English
10	CS3031	Microsoft Office Specialist (MSO-Word)	Computer Science and engineering
11	CS3004	Digital Marketing	Computer Science and engineering
12	CS3002	Introduction of IOT	Computer Science and engineering

SEMESTER 3

Course Code	Category	COURSE TITLE	L	T	P	C	Version
ND3301	PC	Basic Dietetics I	4	0	0	4	1.0
ND3305	PC	Food Science	4	0	0	4	1.0
ND3303	PC	Food Microbiology I	3	0	0	3	1.0
ND3304	PC	Food Service Management I	3	0	0	3	1.0
ND3340	PC	Basic Dietetics Lab I	0	0	4	2	1.0
ND3341	PC	Food Science Lab	0	0	3	2	1.0
ND3342	PC	Food Microbiology Lab I	0	0	2	1	1.0
ND3343	PC	Food Service Management Lab I	0	0	4	2	1.0
	OE	Open Elective II	3	0	0	3	1.0
VP3301	VP	Employability Skills I (Numerical Abilities)	2	0	0	2	1.0
HU3202	FC	United Nations Development Program	1	0	0	1	
GP3301	GP	General Proficiency	0	0	0	1	1.0
		TOTAL	**20**	**0**	**13**	**28**	

Contact Hours: 33

OPEN ELECTIVE II

S.No	Code	Name	Department (Offering)
1	CE3013	Environment Pollution and Waste Management	Civil engineering
2	CS3013	Java Script	Computer Science and engineering
3	CS3023	Big Data Analytics: HADOOP Framework	Management + CSE
4	AG3013	Organic farming	Agriculture
5	BB3013	Establishing a New Business	Business & Management
6	JM3013	Photo Journalism	Journalism
7	HM3013	Chinese Cuisine	Hospitality & Tourism
8	MB3013	SAP 3	Management
9	EG3013	French Intermediate B1	English
10	CS3033	MS -Excel (Advanced) MSO Certification	Computer Science and engineering
11	EG3002	Report Writing	Humanities and Social Sciences

SEMESTER 4

Course Code	Category	COURSE TITLE	L	T	P	C	Version
ND3401	PC	Basic Dietetics II	4	0	0	4	1.0
ND3403	PC	Food Service Management II	4	0	0	4	1.0
ND3404	PC	Food Microbiology II	3	0	0	3	1.0
ND3405	PC	Food Science I	4	0	0	4	1.0
ND3440	PC	Basic Dietetics II Lab	0	0	4	2	1.0
ND3442	PC	Food Service Management-II Lab	0	0	4	2	1.0
ND3443	PC	Food Microbiology II Lab	0	0	2	1	1.0
ND3444	PC	Food Science I Lab	0	0	2	1	1.0
--	OE	Open Elective III	3	0	0	3	1.0
VP3401	VP	Employability Skills II (Aptitude & Reasoning)	2	0	0	2	1.0
GP3401	GP	General Proficiency	0	0	0	1	1.0
		TOTAL	**18**	**0**	**14**	**27**	
After the 4th Semester, students have to attend a summer Internship in a hospital of minimum 45 days. This Internship will be evaluated and awarded in the 5th Semester							

Contact Hours: 32

OPEN ELECTIVE III

S.NO	Code	Name	Department (Offering)
1	CE3015	Hydrology	Civil engineering
2	CS3015	J Query & Databases	Computer Science and engineering
3	CS3025	Data Science Models : Regression, Classification and Clustering	Management + CSE
4	AG3015	Mushroom Cultivation	Agriculture
5	BB3015	E-commerce	Business & Management
6	JM3015	Media industry and Management	Journalism
7	HM3015	Italian Cuisine	Hospitality & Tourism
8	MB3015	SAP 5	Management
9	EG3015	French Advance C1	English
10	CS3035	MSO Access Certification	Computer Science and engineering

SEMESTER 5

Course Code	Category	COURSE TITLE	L	T	P	C	Version	Course Prerequisite
ND3501	PC	Community Nutrition I	4	0	0	4	1.0	NIL
ND3502	PC	Food Packaging	2	2	0	3	1.0	NIL
ND3503	PC	Advance Dietetics I	4	0	0	4	1.0	NIL
ND 3504	PC	Fitness and Sports Nutrition	3	0	0	3	1.0	NIL
	PE	Program Elective I	3	0	0	3	1.0	NIL
ND3540	PC	Community Nutrition I Lab	0	0	2	1	1.0	NIL
ND3541	PC	Food Packaging Lab	0	0	2	1	1.0	NIL
ND3542	PC	Advance Dietetics I Lab	0	0	4	2	1.0	NIL
ND3543	FW	Internship Evaluation	0	0	0	3	1.0	NIL
VP3501	VP	Employability Skills III (GDPI)	2	0	0	2	1.0	NIL
GP3501	GP	General Proficiency	0	0	0	1		NIL
		TOTAL	**18**	**2**	**8**	**27**		

Contact Hours: 28

SEMESTER 6

Course Code	Category	COURSE TITLE	L	T	P	C	Version	Course Prerequisite
ND3601	PC	Community Nutrition II	2	2	0	3	1.0	NIL
ND3602	PC	Product Development and Sensory Evaluation	3	0	0	3	1.0	NIL
ND3603	PC	Advance Dietetics II	2	2	0	3	1.0	NIL
	PE	Program Elective II	3	0	0	3	1.0	NIL
	PE	Program Elective III	3	0	0	3	1.0	NIL
ND3640	PC	Community Nutrition II Lab	0	0	2	1	1.0	NIL
ND3641	PC	Product Development and Sensory Evaluation Lab	0	0	3	2	1.0	NIL
D3642	PC	Advance Dietetics II Lab	0	0	4	2	1.0	NIL
ND3643	S	Seminar	2	0	0	2	1.0	NIL
		TOTAL	**15**	**4**	**9**	**22**		

Contact Hours = 28

Program Electives

S. No	Course Code	Category	COURSE TITLE	L	T	P	C	Version
Program Elective I	ND3517	PE	Food Processing and Technology	3	0	0	3	1.0
	ND3519	PE	Holistic wellness and Life Remedies	3	0	0	3	1.0
	ND3520	PE	Human Development during Life Cycle	3	0	0	3	1.0
Program Elective II	ND3617	PE	Food Preservation and Bakery	3	0	0	3	1.0
	ND3623	PE	Resource Management & Extensive Education	3	0	0	3	1.0
	ND3620	PE	Food Safety and Quality Control	3	0	0	3	1.0
Program Elective III	ND3622	PE	Health Care and Hospital Administration	3	0	0	3	1.0
	ND3621	PE	Health Psychology	3	0	0	3	1.0
	RD3617	PE	Biostatistics & Research Methodology	3	0	0	3	1.0

Note: Or any other course from the MOOC platform duly approved by the University procedure before offering.

B. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) is a versatile and flexible option for each student to achieve his target number of credits as specified by the UGC and adopted by our university.

The following is the course module designed for the Bachelor of Sciences (Nutrition & Dietetics) program:

Core competency: Students will acquire core competency in Nutrition & Dietetics studies and in allied subject areas.

Program/Discipline Specific Elective Course (DSEC):

Skilled communicator: The course curriculum incorporates basics and advanced training in order to make a graduate student capable of expressing the subject through technical writing as well as through oral presentation.

Critical thinker and problem solver: The course curriculum also includes components that can be helpful to graduate students to develop critical thinking ability by way of solving problems/numerical using basic & advance knowledge and concepts of Agricultural Studies.

Sense of inquiry: It is expected that the course curriculum will develop an inquisitive characteristic among the students through appropriate questions, planning and reporting experimental investigation.

Skilled project manager: The course curriculum has been designed in such a manner as to enabling a graduate student to become a skilled project manager by acquiring knowledge about mathematical project management, writing, planning, study of ethical standards and rules and regulations pertaining to scientific project operation.

Ethical awareness/reasoning: A graduate student requires understanding and developing ethical awareness/reasoning which the course curriculums adequately provide.

Lifelong learner: The course curriculum is designed to inculcate a habit of learning continuously through use of advanced ICT technique and other available techniques/books/journals for personal academic growth as well as for increasing employability opportunity.

Value Added Course (VAC)/ Training/ Certification: A value added course is a skill enhancement training beyond the syllabus especially non-credit course which is basically meant to enhance general ability of students in areas like soft skills, quantitative aptitude and reasoning ability, technical new norms of the industry - required for the overall development of a student and at the same time crucial for industry/corporate demands and requirements. The student possessing these skills will definitely develop acumen to perform well during the recruitment process of any premier organization and will have the desired confidence to face the interview. Moreover, these skills are also essential in day-to-day life of the corporate world. The aim is to nurture every student for effective communication, developing aptitude and a general reasoning ability for better performance, as desired in the corporate world. There shall be no credit; however, it will be compulsory for every student to pass these courses with minimum 45% marks to be eligible for the certificate. These marks will not be included in the calculation of CGPI. Students have to specifically be registered in the specific course of the respective semesters from time to time. The department& course coordinator will notify as when starting the course after adequate approval fromhigher authority.

Skill Enhancement Course: This course may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge.

Generic/Open Elective Course (OEC): Open Elective is an interdisciplinary additional subject that is compulsory in a program. The score of Open Elective is counted in the overall aggregate marks under Choice Based Credit System (CBCS). Each Open Elective paper will be of 3 Credits in II, III and IV semesters. Each student has to take Open/Generic Electives from department other than the parent department. Core / Discipline Specific Electives will not be offered as Open Electives.

Non CGPA Audit Course (NCAC): This is a compulsory course but not included in CGPA calculation and will be of 2 credits. Each student of Bachelor of Science Nutrition & Dietetics Program has to compulsorily pass the Disaster Management.

C. Program Outcomes of B.Sc. (Nutrition & Dietetics)

PO-01	**Nutrition Knowledge:**	Utilize knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes.
PO-02	**Implement Strategies:**	Implement strategies for food access, procurement, preparation, and safety for individuals, families, and communities.
PO-03	**Evaluate Information:**	Critically evaluate information on food science and nutrition issues appearing in the popular press.
PO-04	**Technical Skills:**	Apply technical skills, knowledge of health behavior, clinical judgment, and decision-making skills when assessing and evaluating the nutritional status of individuals and communities and their response to nutrition intervention.
PO-05	**Management Skills:**	Perform food management functions in business, health-care, community, and institutional arenas.
PO-06	**Nutritional Ethics:**	Practice state-of-the-art nutrition care in collaboration with other healthcare providers in interdisciplinary settings within the bounds of ethical, legal, and professional practice standards.
PO-07	**Communication:**	Provide nutrition counseling and education to individuals, groups, and communities throughout the lifespan using a variety of communication strategies.
PO-08	**Creativity:**	Demonstrate creativity in the discipline in ways that have practical benefits.
PO-09	**Competence:**	Competence in the skills of assessment, planning, management and evaluation of food service, nutrition and dietetic services in institutional food, community nutrition, and clinical dietetics settings.
PO-10	**Life-long learning**	Students will utilize advanced principles of health literacy, including critical thinking skills, literature searches, data collection and interpretation, necessary for the implementation of food and nutrition services in professional settings.

Program Specific Outcomes (PSO's)

PSO1: Understanding, critically assessing and knowing how to use and apply information sources related to nutrition, food, lifestyle and health.

PSO2: Providing basic training of nutritional science and information about food into practical dietary advice.

PSO3: Understanding the importance and limitations of scientific thinking in the fields of health and nutrition.

Program Educational Outcomes (PEO's)

PEO1: To be well familiar with the concepts of Nutrition & Dietetics for leading a successful career in hospital industry or as entrepreneur or to pursue higher education.

PEO2: To develop applied-commercial skills for providing effective solutions to complex problems using domain knowledge of Nutrition & Dietetics.

PEO3: To instill a lifelong learning approach towards constantly evolving nutritional knowledge with an innovative and ethical mindset.

F. Pedagogy & Unique practices adopted:

"Pedagogy is the method and practice of teaching, especially for teaching an academic subject or theoretical concept".In addition to conventional time-tested lecture method, the institute will emphasize on experiential learning:

Role Play & Simulation: Role- play and simulation are forms of experiential learning. Learners take on different roles, assuming a profile of a character or personality, and interact and participate in diverse and complex learning settings. Role-play and simulation function as learning tools for teams and groups or individuals as they "play" online or face-to-face. They alter the power ratios in teaching and learning relationships between students and educators, as students learn through their explorations and the viewpoints of the character or personality they are articulating in the environment. This student- centered space can enable learner-oriented assessment, where the design of the task is created for active student learning. Therefore, role-play& simulation exercises such as virtual share trading, marketing simulation etc. are being promoted for the practical-based experiential learning of our students.

Video Based Learning (VBL) & Learning through Movies (LTM): These days technology has taken a front seat and classrooms are well equipped with equipment and gadgets. Video-based learning has become an indispensable part of learning. Similarly, students can learn various concepts through movies. In fact, many teachers give examples from movies during their discourses. Making students learn a few important theoretical concepts through VBL & LTM is a good idea and method. The learning becomes really interesting and easy as videos add life to concepts and make the learning engaging and effective. Therefore, our institute is promoting VBL & LTM, wherever possible.

Field/Live Projects: The students, who take up experiential projects in companies, where senior executives with a stake in teaching guide them, drive the learning. All students are encouraged to do some live projects other than their regular classes.

Industrial Visits: Industrial visit are essential to give students hand-on exposure and experience of how things and processes work in industries. Our institute organizes such visits to enhance students' exposure to practical learning and work out for a report of such a visit relating to their specific topic, course or even domain.

MOOCs: Students may earn credits by passing MOOCs as decided by the college. Graduate level programs may award Honors degree provided students earn pre-requisite credits through MOOCs. University allows students to undertake additional subjects/course(s) (In-house offered by the university through collaborative efforts or courses in the open domain by various internationally recognized universities) and to earn additional credits on successful completion of the same. Each course will be approved in advance by the University following the standard procedure of approval and will be granted credits as per the approval. Keeping this in mind, University proposed and allowed a maximum of two credits to be allocated for each MOOC courses. In the pilot phase it is proposed that a student undertaking and successfully completing a MOOC course through only NPTEL could be given 2 credits for each MOOC course.

For smooth functioning and monitoring of the scheme the following shall be the guidelines for MOOC courses, Add-on courses carried out by the College from time to time.

a) It will necessary for every student to take at least one MOOC Course throughout the programme.

b) There shall be a MOOC co-ordination committee in the College with a faculty at the level of Professor heading the committee and all Heads of the Department being members of the Committee.

c) The Committee will list out courses to be offered during the semester, which could be requested by the department or the students and after deliberating on all courses finalize a list of courses to be offered with 2 credits defined for each course and the mode of credit consideration of the student. The complete process shall be obtained by the College before end of June and end of December for Odd and Even semester respectively of the year in which the course is being offered. In case of MOOC course, the approval will be valid only for the semester on offer.

d) Students will register for the course and the details of the students enrolling under the course along with the approval of the Vice Chancellor will be forwarded to the Examination department within fifteen days of start of the semester by the Coordinator MOOC through the Dean of the School.

e) After completion of MOOC course, Studentwill submit the photo copy of Completion certificate of MOOC Course to the Examination cell as proof.

f) Marks will be considered which is mentioned on Completion certificate of MOOC Course.

g) College will consider the credits only in case a student fails to secure minimum required credits then the additional subject(s) shall be counted for calculating the minimum credits required for the award of degree.

Special Guest Lectures (SGL) & Extra Mural Lectures (EML): Some topics/concepts need extra attention and efforts as they either may be high in difficulty level or requires experts from specific industry/domain to make things/concepts clear for a better understanding from the perspective of the industry. Hence, to cater to the present needs of industry we organize such lectures, as part of lecture-series and invite prominent personalities from academia and industry from time to time to deliver their vital inputs and insights.

Student Development Programs (SDP): Harnessing and developing the right talent for the right industry an overall development of a student is required. Apart from the curriculum teaching various student development programs (training programs) relating to soft skills, interview skills, SAP, Advanced excel training etc. that may be required as per theneed of the student and industry trends, are conducted across the whole program. Participation in such programs is solicited through volunteering and consensus.

Industry Focused programme: Establishing collaborations with various industry partners to deliver the programme on sharing basis. The specific courses are to be delivered by industry experts to provide practice-based insight to the students.

Special assistance program for slow learners & fast learners: write the note how would you identify slow learners, develop the mechanism to correcting knowledge gap. Terms of advance topics what learning challenging it will be provided to the fast learners.

Induction program: Every year 3 weeks induction program is organized for 1st year students and senior students to make them familiarize with the entire academic environment of university including Curriculum, Classrooms, Labs, Faculty/ Staff members, Academic calendar and various activities.

Mentoring scheme: There is a Mentor-Mentee system. One mentor lecture is provided per week in a class. Students can discuss their problems with a mentor who is necessarily a teaching faculty. In this way, student's problems or issues can be identified and resolved.

Competitive exam preparation: Students are provided with one class in every week for GATE/ Competitive exams preparation.

Extra-curricular Activities: organizing & participation in extracurricular activities will be mandatory to help students develop confidence & face audience boldly. It brings out their leadership qualities along with planning & organizing skills. Students undertake various cultural, sports and other competitive activities within and outside then campus. This helps them build their wholesome personality.

Career & Personal Counseling: - Identifies the problem of student as early as possible and gives time to discuss their problems individually as well as with the parents. Counseling enables the students to focus on behavior and feelings with a goal to facilitate positive change. Its major role lies in giving: Advice, Help, Support, Tips, Assistance, and Guidance.

Participation in Flip Classes, Project based Learning (A2 Assignment), Workshops, Seminars & writing & Presenting Papers: Departments plan to organize the Flip Classes, Project based Learning(A2 Assignment), workshops, Seminars &Guest lecturers time to time on their respective topics as per academic calendar. Students must have to attend these programs. This participation would be count in the marks of general Discipline & General Proficiency which is the part of course scheme as non-credit course.

Formation of Student Clubs, Membership & Organizing & Participating evens: Every department has the departmental clubs with the specific club's name. The entire student's activity would be performed by the club. One faculty would be the coordinator of the student clubs & students would be the members with different responsibility.

Capability enhancement& Development Schemes: The Institute has these schemes to enhance the capability and holistic development of the students. Following measures/ initiatives are taken up from time to time for the same: Career Counseling, Soft skill development, Remedial Coaching, Bridge Course, Language Lab, Yoga and Meditation, Personal Counseling

Library Visit & Utilization of QLRC: Students may visit the library from morning 10 AM to evening 8 PM. Library created its resources Database and provided through which users can be accessed from any of the computer connected in the LAN.

Detailed Syllabus (Semester wise /course wise)
SEMESTER 1

RD3106	Title: Basics of Human Physiology-I	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	This subject is designed to impart fundamental knowledge of the structure and functions of the various systems of the human body.	
Unit No.		No. of hours (per Unit)
Unit I	Cell and Tissues	7
Cell – Structure and functions. Physiological properties of protoplasm. Levels of cellular organization. Organelles, tissues, organs and systems. Cell membrane transport. Tissues - Structure and functions of epithelial, connective, muscular and nervous tissue. Water and electrolyte balance - Distribution of water and electrolytes, requirements and sources, regulationof water balance, electrolyte balance, deficiency and excess.		
Unit II	Digestive System	8
Accessory organs of digestion – Structure and functions – Teeth, Tongue, Salivary glands; Saliva – Composition and functions. Organs of Digestion – Esophagus, Stomach, Small intestine and large intestine – Structure and functions, Movements of the digestive system. Associated organs of digestion – Liver, Gallbladder, Pancreas (Digestive function) and Spleen. Disorders and Diseases – anorexia, Achlorhydria, Peptic ulcer, gastric ulcer and duodenal ulcer, gastritis, typhoidjaundice.		
Unit III	Circulatory System	7
Blood – Formation, composition and functions, blood coagulation, blood groups and Rhesus factor, blood transfusion. Disorders – Anemia, Leukemia, hemophilia. Blood vessels – Types of Blood vessels. Disorders – Varicose veins, arteriosclerosis. Blood Pressure – Factors affecting blood pressure, hypertension, Pulse, Tachycardia and Bradycardia. Heart - Structure and functions, cardiac cycle, conduction system of the heart, ECG and its significance. Disorders – Angina pectoris, myocardial infarction. Lymphatic system – Lymph glands and its functions; Lymph - Composition and functions.		
Unit IV	Excretory System	7
Organs of Excretion – Structure and functions of kidney, ureter, urinary bladder, urethra. Mechanism of urine formation, composition of urine, Micturition. Role of kidney in maintaining pH of blood. Acid-base balance. Disorders and Diseases -nocturnal enuresis, polyuria, diuresis, uremia, hematuria, nephritis.		
Unit V	Respiratory System	7
Upper respiratory passages – nasal cavities, pharynx, larynx and trachea. Lungs – Structure and functions, Lung capacity, Respiratory Quotient. Exchange and Transportation of respiratory gasses. Role of hemoglobin and buffer systems. Disturbances in respiration – Apnea, Dyspnea, Hypoxia. Diseases – Bronchitis, Tuberculosis, Pneumonia, Asthma.		
Text Book	1. Meyer B J, Meij H S and Meyer A C., Human Physiology, AITBS Publishers andDistributors. 2. Wilson, K.J.W and Waugh, Ross and Wilson, Anatomy and Physiology in Health and Illness, ChurchillLivingstone.	
Reference Books	1. Jain, A.K., Textbook of Physiology, Vol. I and II, Avichal Publishing Co., NewDelhi. 2. Chatterjee C.C., Human Physiology, Vol. I & II, Medical Allied Agency,Calcutta. 3. Guyton, A.G. and Hall, J.B., TextBook of Medical Physiology, W.B. Sanders Company, Prism Books (Pvt.) Ltd.,Bangalore.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for RD3106

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/ Enrepreneurship(Ent)/None (use, for more than one)
CO1	Students should be able to learn about basic physiology of cells & tissues and their distribution in human body	2	Emp,S
CO2	students should be able to learn about digestive system and their disorders	2	Emp,S
CO3	students should be able to learn about circulatory system and its working	1	Emp,S
CO4	students should be able to learn about basic physiology of excretory system	2	Emp,S
CO5	students should be able to learn about the mechanism of respiratory system in the human body	2	Emp,S

CO-PO Mapping for RD3106

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	1	0	1	0	1	2	2	0	3	2	2	3	2
CO2	3	2	2	3	3	2	3	1	3	3	3	1	2
CO3	2	1	1	2	1	1	1	2	2	3	2	2	2
CO4	1	2	2	3	2	2	1	2	2	2	3	3	2
CO5	2	1	2	2	1	1	3	2	3	3	2	1	2
AVEG.	1.8	1.2	1.6	2	1.6	1.6	2	1.4	2.6	2.6	2.4	2	2

ND3102	Title: Fundamentals of Foods & Nutrition- I	L T P C 40 04
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart fundamental knowledge of proteins, carbohydrates, lipids and their daily requirements in human body.	
Unit No.		No. of hours (per Unit)
Unit I	Introduction to Nutrition	10
Concept and definition of terms Nutrition, Malnutrition and Health. Brief history of Nutritional Science, Scope of Nutrition. Food as a source of macro & Micro Nutrients. Physiological, psychological and social functions of food. Basic five food groups. Minimal Nutritional Requirements and RDA- Formulation of RDA and Dietary Guidelines- Reference Man and Reference women.		
Unit II	Carbohydrates	10
Carbohydrates- Definition, Classification, functions Sources & RDA. Digestion and Absorption, Blood glucose and effect of different carbohydrates on blood glucose. Dietary Fiber – Nutritional significance.		
Unit III	Proteins	10
Definition, classification and functions. Assessment of protein quality (BV, PER, NPU), Digestion and Absorption, factors affecting protein bio-availability including anti-nutritional factors. Requirements, deficiency.		
Unit IV	Lipids	10
Definition, classification and functions of lipids. Digestion and absorption, Intestinal re-synthesis of triglycerides. Types of fatty acids, role and nutritional significance (SFA, MUFA, PUFA, omega-3).		
Unit V	Water	8
Water as nutrient. Components of body fluids. Function. Sources. Requirement. Water balance. Effect of deficiency and excess.		
Text Book	1. Shubhangini A. Joshi, "Nutrition and Dietetics" TataMc Grow- Hill publishing Company Ltd, NewDelhi. 2. Srilakshmi. B – "Nutrition Science", New Age International Swaminathan. M," Food & Nutrition" The Bangalore Press.	
Reference Books	1. Passmone R and Eastwood M.A, "Human Nutrition and Dietetics", English languagebook Society/Churchill Livingstone, HongKong. 2. Neiman N. Catherine, "Nutrition",Wm.C. Brown Publishers 3. Berdanier C.D, Dwyer J.T , Herber D, "Handbook of Nutrition and Food", 3rd Edition; CRC Press	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for ND3102

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S) /Enterpenureship(Ent)/None (use, for more than one)
CO1	Students should be able to apply fundamental knowledge related to nutrition and RDA's	2	Emp,S
CO2	Students should be able to understand the functions and role of carbohydrates, their requirements and the effect of deficiency and excess	2	Emp,
CO3	Students should be able to understand the functions and role of proteins, their requirements and the effect of deficiency and excess	2	Emp,
CO4	Students should be able to understand the functions and role of lipids, their requirements and the effect of deficiency and excess	1	Emp,
CO5	Students should be able to analyze the role of various minerals and vitamins important in maintaining health.	2	Emp,

CO-PO Mapping for ND3102

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO 2	PSO3
CO1	3	3	2	3	1	1	3	2	1	0	0	2	0
CO2	2	3	0	1	2	2	1	0	1	2	2	2	1
CO3	1	3	3	1	1	1	2	2	3	3	1	3	2
CO4	1	1	0	2	0	2	0	1	2	1	0	0	2
CO5	2	0	0	2	1	0	2	2	3	2	1	0	3
AVEG.	1.8	2	1	1.8	1	1.2	1.6	1.4	2	1.6	0.8	1.4	1.6

ND 3105	Title: Biochemistry	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To enable the students to understand about the equipment's used in labs and their applications.	
Expected Outcome	At the end of the course, the students will have enough knowledge of the equipment's and their applications as well as taking care & maintenance of equipment's and samples.	
Unit No.		No. of hours (per Unit)
Unit: I	Introduction to Fundamental and Clinical Biochemistry	7
Introduction to Fundamental and Clinical Biochemistry, First aid in laboratory accidents. Principle, working, care & maintenance of Weighing balance, hotplate, centrifuges, incubator, hot air oven, colorimeter, Spectrophotometer, pH meter.		
Unit II	Buffers	8
Preparation of solution and reagents, normal solution, molar solutions, percent solution, buffer solution, dilutions, w/v,v/v, concepts of acid and base, units of measurement: SI unit, reference range, conversion factor, units for measurement of enzymes, protein, osmolarity, drugs,hormones, vitamins.		
Unit III	Carbohydrates, Lipids and Enzyme	7
Carbohydrates: Structure, Classification and their function in biological system.Proteins: Classification, Primary, secondary and tertiary structure and functions of protein.Amino acids: classification, Structure, properties and biological functions.Lipids: Classification of lipids, Classification of fatty acids, their biological functions. Enzymes: Definition, classification of enzyme, units for measuring enzyme activity.		
Unit IV	Nucleic acids	7
Nucleic acids: Structure, function and types of DNA and RNA. Nucleotides, Nucleosides, Nitrogen bases, and role of Nucleic acid.		
Unit V	Vitamins	7
Vitamins: classification, function and disease associated with vitamins.Role of Minerals and ions: Calcium, Iron, Iodine, Zinc, Phosphorus, Copper, Potassium, Zinc.		
Text Books	1. Vasudevan DM, Sreekumari S, Vaidyanathan K. Textbook of biochemistry for medical students. JP Medical Ltd. 2. Satyanarayan .U, "Biochemistry" 5th Edition; Elsevier	
Reference Books	1. Hames BD, Hooper NM, Hames BD. Instant notes in biochemistry. Biochemical education. 2. Devlin TM, editor. Textbook of biochemistry: with clinical correlations.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for ND3105

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/ Entrepreneurship(Ent)/None (use, for more than one)
CO1	Students should be able to understand the fundamentals of clinical biochemistry	2	Emp,
CO2	Students should be able to learn the various molecular aspects like, solution, acid, base, pH etc.	2	Emp,
CO3	Students should be able to learn the structure and functions related to carbohydrates, lipids and enzymes.	2	Emp,
CO4	Students should be able to learn the structure and functions of different nucleic acids.	2	Emp,
CO5	Students should be able to learn the role of different vitamins.	1	Emp,

CO-PO Mapping for ND3105

Course Outcomes	Program Outcomes (Course Articulation Matrix(Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO10	PSO 1	PSO 2	PSO3
CO1	2	2	1	1	1	1	2	1	3	1	1	3	3
CO2	1	2	3	1	1	2	2	1	3	1	2	1	2
CO3	3	2	1	2	2	3	1	3	3	2	1	3	1
CO4	2	0	2	2	2	3	3	3	1	2	3	2	3
CO5	3	3	1	3	2	2	9	2	2	2	3	1	2
AVEG.	2.2	1.8	1.6	1.8	1.6	2.2	1.8	2	2.4	1.6	2	2	2.2

ND 3104	Title: Food, Hygiene and Sanitation	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Course Outcomes	1. Students should be able to learn about the basic concept of health and health problems of developed and developing countries. 2. Students will learn about importance of water and various methods of cleaning for utensils and equipment's. 3. Students should be able to learn about various types of diseases and their modes of spread. 4. Students should be able to learn about food spoilage, food poisoning and different types of toxins. 5. Students should be able to learn about various national immunization programs and vaccine schedules. Students also learn about family welfare and planning.	
Unit No.		No. of hours (per Unit)
Unit I	Health & Hygiene	8
Health and Hygiene - Definition and concepts of health, important public health acts, health problems of developed and developing countries, environment and health. Introduction to Sanitation and Hygiene: Definition of sanitation and hygiene, factors affecting it- food habits, cleanliness, exercise and sleep. Significance of sanitation in food industry. Personal Hygiene of food handler. Waste Product Handling – garbage and sewage disposal, Pest control. **Sanitation**- Methods of killing microorganism & inhibiting microbial growth. **First aid**: Basic emergency care and first aid, importance in daily life. Principles of first aids. Components of First Aid Kit. Different methods of First Aids(ABC &CPR). Handling methods of patients.		
Unit II	Water & Cleaning Compounds	7
Water – Importance of water, impurities present in water, sources of contamination of water and water purification (Household and natural methods), waste water handling, waste disposal. **Cleaning Methods:** Sterilization and Disinfection- products and methods, use of detergents, heat, chemicals, steps in cleaning utensils and equipments. **Cleaning compounds**- Classification, Detergent auxiliaries, Sanitizers.		
Unit III	Infection, Types And Disinfectants	7
Infection – Definitions of Infection, Infective agents, Period of infectivity. Types of diseases and their modes of spread. Channels of infection **Disinfectants** – Definition, types and methods of disinfection. **Infectious diseases** - Causes, incubation period, mode of spread, symptoms, prevention & control of the following diseases- a) Diseases spread by insects -**Malaria, Dengue**. b) Diseases spread by ingestion - **Dysentery, cholera, typhoid** c) Diseases spread by droplet infection - **Chicken pox, measles, mumps**, d) Disease spread by Contact - **Leprosy, AIDS**		
Unit IV	Food spoilage & toxins	7
Food Spoilage, Food poisoning & Toxins-Introduction, Organism involved, source of food contamination. Cleaning steps in dairy industry, meat, sea food plants & vegetable and fruit. Control of food poisoning. Food intoxication. Fungal& bacterial toxins. Control measures.		
Unit V	Immunization	7
Immunization-Immunization programme, various national immunization programs and vaccine schedules, Family welfare and planning, Health planning in India including various committees, national health policy and health goals. Objectives and goals of WHO, UNICEF, Indian Red Cross Society, UNFPA, FAO, ILO **Common emerging health problems among women**: Cancer of Breast and Cervical		
Suggested Reference Books	• Yash pal Bedi (1976) Hygiene & Public Health. Anand Publishing Co., gali No. 1, NawanKot Amritsar. • V. N. Hhave, (1975) You & Your Health.. National Book Trust • Bihari Lal Bhatia, (1961) Elementary.. Hygiene, Orient Longmans, Ltd. Calcutta -13 • J.E. Park, (1983) Preventive & Social Medicine, Jabalpur MessrsBanarcidasBhanot • Birendra Nath Ghosh, (1969) Hygiene & Public Health Calcutta Scientific Publishing Co.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	

Date of approval by the Academic Council	20-10-2022

Course outcomes for ND3104

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/Skill(S)/Entrepreneurship(Ent)/None (use, for more than one)
CO1	Students should be able to learn about the basic concept of health and health problems of developed and developing countries.	2	S
CO2	Students will learn about importance of water and various methods of cleaning for utensils and equipment's.	1	Emp,
CO3	Students should be able to learn about various types of diseases and their modes of spread.	2	S
CO4	Students should be able to learn about food spoilage, food poisoning and different types of toxins	2	S
CO5	Students should be able to learn about various national immunization programs and vaccine schedules. Students also learn about family welfare and planning.	2	S, Ent

CO-PO Mapping for ND3104

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PSO 1	PSO 2	PSO3
CO1	1	2	1	1	2	1	2	1	2	2	1	2	3
CO2	1	1	2	1	1	1	2	1	2	1	2	2	3
CO3	1	2	1	2	2	2	2	2	2	1	1	2	3
CO4	1	1	2	1	1	2	2	2	2	2	2	2	3
CO5	1	1	1	2	1	2	2	2	2	2	1	2	3
AVEG.	1	1.4	1.4	1.4	1.4	1.6	2	1.6	2	1.6	1.4	2	3

RD3143	Title: Basics of Human Physiology I Lab	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart fundamental knowledge on the structure and functions of the various systems of the human body.	
Experiment No.	List of Experiments	
1. To measure pulse rate, heart rate 2. To measure blood pressure 3. To measure temperature 4. Measurement of the Vital capacity. 5. Calculation and evaluation of daily energy and nutrient intake. 6. Measurement of basal metabolic rate 7. Microscopic study of different tissues - Epithelial, connective, muscular & nervous tissues 8. Microscopic study of digestive organs - Pancreas, stomach, small intestine, liver 9. Microscopic study of respiratory organs - Lung, trachea 10. Microscopic study of excretory system - Kidney, nephron 11. Microscopic examination of prepared slides - Fresh mount of blood and stained blood smear		
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for RD3143

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/Entrepreneurship(Ent)/None (use, for more than one)
CO1	Students should be able to learn about microscopic studies of different human body systems.	2	Emp
CO2	Students should be able to learn about microscopic studies of different types of tissues.	2	S
CO3	Students should be able to learn about estimation of HB level in the human body.	1	S

CO-PO Mapping for ND3143

Course Outcomes	Program Outcomes (Course Articulation Matrix(Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PS O1	PSO2	PSO3
CO1	2	2	1	2	1	1	2	2	1	3	3	2	2
CO2	2	2	1	2	1	1	2	2	1	3	3	2	2
CO3	2	2	1	2	1	1	2	2	1	3	3	2	2
AVEG.	**2**	**2**	**1**	**2**	**1**	**1**	**2**	**2**	**1**	**2**	**3**	**2**	**2**

ND3141	Title: Fundamentals of Foods & Nutrition- I Lab	LTP C 0 0 4 2
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart fundamental knowledge of nutrition and nutritional components.	
Experiment No.	List of Experiments	

1. Estimation of calorific value of food.
2. Estimation of moisture content.
3. Estimation of ash content.
4. Preparation of buffers (acidic, neutral and alkaline) and determination of pH.
5. Qualitative identification of carbohydrates – glucose, fructose, galactose, sucrose, maltose, lactose.
6. Preparation of Osazones and their identification.
7. Qualitative identification of amino acids – histidine, tyrosine, tryptophan, cysteine, arginine.
8. Qualitative identification of lipids – solubility, saponification, acrolein test, Salkowski test, Lieberman-Burchard test.
9. Quantitative estimation of glucose

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course outcomes for ND3141

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/ Entrepreneurship(Ent)/None (use, for more than one)
CO1	Students should be able to estimate the calorific value, ash value and moisture content of food.	2	Emp,S
CO2	Students should be able to prepare the buffers and determine their pH value	2	S
CO3	Students should be able to identify carbohydrates, lipids, proteins and minerals quantitatively.	1	S

CO-PO Mapping for ND3141

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	0	2	3	1	1	2	2	3	3	3	2	3
CO2	1	3	2	3	2	1	2	0	1	0	2	2	2
CO3	2	1	2	2	3	0	0	2	3	3	2	0	2
AVEG.	1.6	1.3	2	2.6	2	0.6	1.3	1.3	2.3	2	2.3	1.3	2.3

ND3144	Title: Biochemistry Lab	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart practical knowledge on estimation of acid number, iodine number and saponification value of oils.	
Experiment no.	List of Experiments	

1. Demonstration of Lab Glassware and Instruments.
2. Preparation of Normal solution.
3. Preparation of Acidic Buffers & Alkaline buffer
4. Demonstration of Acid-Base Indicator
5. Determination of Acid number in edible oil.
6. Determination of Iodine number in edible oil.
7. Determination of Saponification number in edible oil.
8. Identification of CHO by Molish test.
9. Identification of reducing & non-reducing sugars
10. Determination of blood sugar

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course outcomes for ND3144

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/Entrepreneurship (Ent)/None (use, for more than one)
CO1	Students should be able to learn the formation of different types of solutions	3	S, Emp
CO2	Students should be able to determine the acid value, iodine value and saponification value of fats to check their purity.	3	S, Emp
CO3	Students should be able to identify the various types of sugars.	3	S, Emp

CO-PO Mapping for ND3144

Course Outcomes	Program Outcomes (Course Articulation Matrix(Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO1 0	PS O1	PSO2	PSO3
CO1	1	2	2	2	2	1	2	3	2	3	1	2	1
CO2	2	2	2	1	2	1	1	2	2	2	2	2	2
CO3	1	2	1	3	3	1	2	3	2	1	3	2	2
AVEG.	1.3	2	1.6	2	2.3	1	1.6	2.6	2	2	2	2	1.6

CY3205	Title: Environmental Studies	L T P C 2 0 0 2
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	Creating awareness among engineering students about the importance of environment, the effect of technology on the environment and ecological balance is the prime aim of the course.	
Expected Outcome	Students will understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Introduction to environmental studies & Ecosystems	5
Multidisciplinary nature of environmental studies, Scope and importance, Need for public awareness. Concept, Structure and function of an ecosystem, energy flow in an ecosystem: food chains, food webs and ecological pyramids. Examples of various ecosystems such as: Forest, Grassland, Desert, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)		
Unit II	Natural Resources: Renewable & Non- renewable resources	5
Land as a resource, land degradation, landslides (natural & man-induced), soil erosion and desertification. Forests & forest resources: Use and over-exploitation, deforestation. Impacts of deforestation, mining, dam building on environment and forests. Resettlement and rehabilitation of project affected persons; problems and concerns with examples. Water resources: Use and over-exploitation of surface and ground water, floods, drought, conflicts over water (international &inter-state). Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems with examples. Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.		
Unit III	Biodiversity & Conservation	5
Levels of biological diversity: genetic, species and ecosystem diversity. Bio-geographic zones of India. Ecosystem and biodiversity services. Biodiversity patterns and global biodiversity hot spots, India as a mega-biodiversity nation; endangered and endemic species of India. Threats to biodiversity: Habitat loss, poaching of wildlife, man- wildlife conflicts, biological invasions. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.		
Unit IV	Environmental Pollution	4
Environmental pollution and its types. Causes, effects and control measures of :a) Air pollution b) Water pollution – freshwater and marine c) Soil pollution d) Noise pollution e) Thermal pollution Nuclear hazards and human health risks, Solid waste management: Control measures of urban and industrial waste.		
Unit V	Environmental Policies & Practices	5
Concept of sustainability and sustainable development. Water conservation & watershed management. Climate change, global warming, acid rain, ozone layer depletion. Disaster management: floods, earthquake, cyclones and landslides. Wasteland reclamation. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation. Environment: rights and duties. Population growth. **Field work** Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of simple ecosystems -pond, river, hill slopes, etc.		
Text Books	1. Bharucha. E, Textbook of environmental Studies for Undergraduate Courses.	
Reference Books	1. KaushikAnubha, Kaushik C P, Perspectives in environmental Studies New Age Publication. 2. Rajagopalan, environmental Studies from Crisis to Cure, Oxford University Press.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for CY3205

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/Skill(S)/Entrepreneurship (Ent)/None (use, for more than one)
CO1	Students should be able to understand the issues related to the environment and their impact on human life.	2	Emp, S
CO2	Students should be able to understand on the solutions related to the environmental problems.	2	S
CO3	Students should be able to understand different components of the environment and their function and sustainable development.	2	S
CO4	Students should be able to comprehend the importance of ecosystem and biodiversity	2	Emp, S
CO5	Students should be able to correlate the human population growth and its trend to the environmental degradation and develop the awareness about his/her role towards environmental protection and prevention	2	Emp, S

CO-PO Mapping for CY3205

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO 5	PO6	PO7	PO8	PO9	PO1 0	PSO1	PSO2	PSO3
CO1	1	0	3	3	0	1	2	0	0	1	2	3	1
CO2	3	0	2	0	1	2	2	0	2	3	0	1	1
CO3	2	0	0	2	1	2	3	0	0	3	3	2	2
CO4	0	2	1	0	0	0	2	1	1	2	1	3	0
CO5	2	2	0	2	2	1	0	0	3	1	3	0	3
AVEG.	1.6	0.8	1.2	1.4	0.8	1.2	1.8	0.2	1.2	2	1.8	1.8	1.4

SEMESTER 2

RD3206	Title: Basics of Physiology-II	L T P C 3 0 03
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of human Physiology.	
Expected Outcome	The student would acquire fundamental knowledge of structure and functions various systems of human body	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Nervous System	7
Central nervous system - Brain and spinal cord – structure and function. Cerebrospinal fluid. Peripheral nervous system - cranial and spinal nerves. Autonomic nervous system – parasympathetic and sympathetic system – conduction of nerve impulse, synapse, reflex arc, reflex action. Diseases and Disorders - insomnia, Alzheimer's disease, schizophrenia, hydrocephaly, meningitis.		
Unit II	Sensory Organs	8
Eye – Structure and functions. Physiology of vision. Defects in vision – myopia and hypermetropia, astigmatism. Diseases – Conjunctivitis, trachoma, glaucoma, cataract. Ear – Structure and functions. Deafness, vertigo. Nose – Structure and functions. Sinusitis. Skin – Structure and functions. Dermatitis and burns.		
Unit III	Endocrine System	7
Hormones – endocrine glands - Pituitary, Thyroid, Parathyroid, Pancreas (endocrine function), Adrenal – Their structure and functions. Hormones of reproduction. Disorders of over and under secretion.		
Unit IV	Reproductive System	7
Male reproductive system – Structure and functions. Spermatogenesis. Female reproductive system – Structure and functions. Oogenesis. Menstrual cycle, Puberty, Menopause. Fertilization, Development of fertilized ovum (Brief account) – Placenta and its functions – Parturition. Physiology of lactation – Hormonal control in lactation. Abortion, Ectopic pregnancy, multiple pregnancy, artificial insemination, test tube baby - IVF,ETT& GIFT.		
Unit V	Musculoskeletal System	7
Skeletal system – Structure of bone, Functions of the skeletal system. Joints – Types of joints. Muscular system – Functions of the muscles. Muscular contraction. Diseases and disorders - arthritis, osteoporosis, tetany, and muscle fatigue, rigor mortis, myasthenia gravis.		
Text Books	1. Meyer B J, Meij H S and Meyer A C., Human Physiology, AITBS Publishersand Distributors. 2. Wilson, K.J.W and Waugh, A.: Ross and Wilson, Anatomy and Physiology in Healthand Illness, 8th Edition, ChurchillLivingstone.	
Reference Books	1. Ranganathan, T.S. : A Textbook of Human Anatomy, Chand & Co. N.Delhi. 2. Jain, A.K.: Textbook of Physiology, Vol. I and II. Avichal Publishing Co., NewDelhi. 3. Chatterjee C.C.: Human Physiology, Vol. I & II, Medical Allied Agency,Calcutta. 4. Guyton, A.G. and Hall, J.B.: Text Book of Medical Physiology, (9th Edition,W.B. Sanders Company, Prism Books (Pvt.) Ltd.,Bangalore.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for: RD3206

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/Entrepreneurship(Ent)/None (use, for more than one)
CO1	Student should be able to understand about the different mechanism of nervous system in human body	3	Emp,S
CO2	Student should be able to understand about physiology, structure and function of different sense organs.	2	Emp,S
CO3	Student should be able to understand about hormones and their role in human body.	3	Emp,S
CO4	Students should be able to understand about various physiology of male and female reproductive organs.	2	Emp,S
CO5	Students should be able to understand about the skeletal system of human body.	3	Emp,S

CO-PO Mapping for RD3206

Course Outcomes	Program Outcomes (Course Articulation Matrix(Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	1	3	0	1	2	1	3	0	2	3	2	1
CO2	0	1	0	2	3	0	1	2	0	0	1	1	2
CO3	2	3	2	3	1	3	2	0	3	0	1	3	2
CO4	1	0	0	0	3	0	3	3	2	0	1	2	0
CO5	3	0	3	1	0	2	1	1	1	1	0	3	0
AVEG.	1.6	1	1.6	1.2	1.6	1.4	1.6	1.8	1.2	0.6	1.2	2.2	1

RD3243	Title: Basics of Human Physiology-II Lab	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart fundamental knowledge on the Physiology of the human body.	
Expected Outcome	The students will be able to explain the morphology of human body, tissues and able to count RBC, WBC in blood, heart rate, pulse rate and determine the hemoglobincontent of the blood.	
Experiment No.	List of Experiments	

1. Blood count - red blood corpuscles count
2. Blood count - white blood corpuscles count
3. Determination of bleeding time of blood.
4. Determination of clotting time of blood.
5. Determination of blood groups.
6. Determination of ESR value.
7. Microscopic structure of various glands – Thyroid, pituitary, adrenal
8. Microscopic structure of reproductive organs – Ovary, uterus, mammary gland, testis
9. To demonstrate microscopic structure of bones with permanent slides.
10. To demonstrate microscopic structure of muscles with permanent slides
11. To study about the various wave pattern of ECG
12. Estimation of Haemoglobin by Sahli's Method

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course outcomes for RD3243

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/ Skill(S)/enterpenureship(Ent)/None (use, for more than one)
CO1	Students should be able to learn the microscopic view of various glands & reproductive organs.	2	S
CO2	Students should be able to learn the various test related to blood like RBC count, WBC count, coagulation time and blood grouping	4	Emp,S
CO3	Students should be able to learn to estimate blood pressure using sphygmomanometer and changes in pulse rate on exercise.	3	Emp,S

CO-PO Mapping for RD3243

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	0	3	1	1	2	1	2	3	0	1	2	3
CO2	0	2	2	1	2	2	2	3	2	2	3	3	3
CO3	3	3	1	1	1	3	3	0	0	3	1	3	0
AVEG.	1.5	1.6	2	1	1.3	2.3	2	1.6	1.6	1.6	1.6	2.6	2

ND3203	Title: Nutrition Through Life Cycle	L T P C 4 0 04
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of nutritional requirements in special conditions like pregnancy, childhood and geriatrics	
Expected Outcome	The student would be able to design diet plan for specific categoryage.	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Basic principles of meal and menu planning	8
Defination, Types of menu, Factors to be considered in meal/menu planning. Advantages and Disadvantages of Menu planning, Steps, Principles and Objectives of Meal Planning.		
Unit II	Nutrition in pregnancy and lactation	10
Pregnancy - Physiological stages of pregnancy, nutrition requirements food selection and Complications of pregnancy. Lactation - Physiology of lactation, nutritional requirements.		
Unit III	Nutrition during infancy and early childhood	10
Infancy - Growth and development, nutritional requirements, breast feeding, infant formula. Introduction of supplementary foods. Early childhood. (Toddlers and Preschoolers) - Growth and nutrient needs, nutritional relatedproblems, Feeding Pattern.		
Unit IV	Nutrition for school children and adolescence	10
School children - Nutritional requirements, Importance of snacks, school lunch. Adolescence - Growth, Nutrient needs, food choice, eating habits, factors influencing their eating behaviour.		
Unit V	Geriatrics nutrition	10
Factors affecting food intake and nutrients use, nutrient needs, nutrition related problems.		
Text Books	1. B.Shri.Lakshmi , " Dietetics", New Age International Publishers 2. Kumud Khanna et al, "Food, Nutrition and Dietetics" 3. F.P.Antia, "Clinical Dietetics and Nutrition" 4. Shubangini A Joshi: Nutrition and Dietetics, Tata McGraw Hill Pub. Co. Ltd., NewDelhi. 1. .National Institute of Nutrition: Dietary Guidelines for Indians – AManual, Hyderabad.	
Reference Books	1. Mahan, L.K. and Escott-Stump, S., Krause's Food, Nutrition and Diet Therapy, W.B. Saunders Company, London. 2. Williams S.R.: Nutrition and Diet Therapy, 7th Ed. Times Mirror /Mosby College Publishing, St. Louis.	
Mode of Evaluation	Internal & External	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for ND3203

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/ Skill(S)/Entrepreneurship(Ent)/None (use, for more than one)
CO1	Student should be able to understand about the basic steps of meal planning for different age groups with specific requirements.	2	Emp,S
CO2	Student should be able to understand about nutritional requirements during pregnancy, lactation and different stages of pregnancy.	2	Emp,S
CO3	Student should be able to understand about feeding patterns, nutritional related problems during and nutritional requirements during infancy and early childhood.	2	Emp,S
CO4	Students should be able to understand about importance of lunch and snacks for school going children	2	Emp,S
CO5	Students should be able to understand about care process of elderly people (geriatric nutrition)	2	S

CO-PO Mapping for ND3203

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO10	PSO1	PSO 2	PSO 3
CO1	2	3	1	1	2	3	2	2	3	1	3	2	2
CO2	3	2	2	3	3	1	2	1	2	3	2	2	3
CO3	3	2	3	3	2	3	3	2	2	3	3	3	3
CO4	3	1	2	2	3	2	2	2	2	3	3	1	3
CO5	1	1	2	3	2	3	1	2	2	2	3	3	3
AVEG.	2.4	1.8	2	2.4	2.4	2.4	2	1.8	2.2	2.4	2.8	2.2	2.8

ND3242	Title: Nutrition Through Life Cycle Lab	L T P C 0 0 4 2
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart fundamental knowledge on the nutrition and planning the diet chart	
Expected Outcome	The students will be able to plan balance diet for every age group	
Experiment No.	List of Experiments	

1. Planning, preparation & calculation of diet for different level of activity workers - preparation of a adult men and women, during different activities - sedentary, moderate, heavy of above diets.
2. Planning, preparation & calculation of balanced diet for a pregnantwoman.
3. Planning, preparation & calculation of balanced diet for a nursing mother.
4. Planning preparation & calculation of supplementary and weaning foods.
5. Planning, preparation & calculation of meals/packedlunch for toddler and preschool child.
6. Planning, preparation & calculation of balanced diet for school going children.
7. Planning, preparation & calculation of balanced diet for adolescent boy/Girl.
8. Planning, preparation & calculation of meals/diet for senior citizens.

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course outcomes for ND3242

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/ Skill(S)/Entrepreneurship(Ent)/None (use, for more than one)
CO1	Students should be able to learn the planning of various diets according to the age, sex and RDA's	6	Emp,S
CO2	Students should be able to learn the preparation and calculation of various diets plans.	6	S, Emp, Ent
CO3	Students should be able to learn the planning and preparation of weaning foods for infants and packed foods for school going children	6	Emp, S, Ent

CO-PO Mapping for ND3242

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	2	2	2	2	3	2	2	1	3	3	2	3
CO2	3	1	2	2	3	2	2	1	1	2	3	3	2
CO3	2	3	1	2	3	3	3	2	2	3	2	3	3
AVEG.	**2**	**3**	**1**	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**3**	**3**

ND3206	Title: Nutritional Biochemistry	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart knowledge related to nutrients role in body metabolism.	
Expected Outcome	The student would acquire knowledge about role of different nutrients in maintaining metabolism in the human body.	
Unit No		No. of hours (per Unit)
Unit: I	Water Metabolism	7
Distribution of fluids in the body, ECF, ICF, Water metabolism, Functions of water, Distribution of total body water, Regulation of water balance, Dehydration, Biomedical importance, pH, Buffers, Acidosis		
Unit II	Carbohydrates Metabolism	7
Carbohydrate Metabolism: Basic structure, Metabolism of glucose (glycolysis), fructose and galactose; Metabolism of pyruvate and lactate; Metabolism of acetyl Co A (TCA cycle); energetic of glucose metabolism, Synthesis of ribose (HMP Shunt); Synthesis of glucose from noncarbohydrates (gluconeogenesis); Metabolism of Glycogen-Glycogenesis and Glycogenolysis.		
Unit III	Lipid Metabolism	7
Lipid metabolism: Basic structure, Metabolism of Triacylglycerol, synthesis of fatty acid saturated and unsaturated; Beta-oxidation of fatty acid-; Metabolism of Cholesterol; Metabolism of Ketone bodies		
Unit IV	Protein Metabolism	8
Protein metabolism: Basic structure of protein and amino acids; General pathways of amino acid metabolism - Deamination, transamination, decarboxylation, and demethylation; urea cycle and fate of ammonia. Integration of metabolic pathways of energy metabolism, Metabolism in diabetes, obesity, starvation. Regulation of metabolism: Interrelationship of carbohydrate, protein and lipid metabolism. Metabolic adaptation during starvation, exercise, stress and diabetes mellitus.		
Unit V	Biological Oxidation & Molecular Transport System	7
Oxidant, reductant, Theories on Biological Oxidative phosphorylation, High-energy phosphates, Myokinase reaction. Passive diffusion, facilitated diffusion, active transport, coupling reaction		
Text Books	1. Satyanarayana.U (2005), Biochemistry, Uppala Author-Publisher Interlinks,Vijayavada,A. 2. Jain J.L , Jain S , Jain N.(2005),Fundamentals of Biochemistry, S.Chand& Company LTD , New Delhi	
Reference Books	1. Deb.A.C., Fundamentals of Bio chemistry, New Central Book Agency(P) ltd. 2. S. Ramakrishnan, K.G Prassanan, R.Rajan,"Text book of Medical Bio chemistry" Orient Longman limited. 3. Hames B.D and Hooper N.M (2001) Instant notes on Biochemistry, Viva books private limited, NewDelhi. 4. Devlin T.M (2002), Text book of Biochemistry with Clinical Correlations, A John Wiley and Sons Publications. 5. Fatima D. et al, (1999) Biochemistry, Saras Publication, Nagarcoil, Tamil Nadu. 6. Lehninger A.L (1987), Principles of Biochemistry, CBS Publishers and Distributors. 7. Pattabhiraman T.N (1993), Principles of Biochemistry, Prithvi Book Agency.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for ND3206

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the distribution of fluids in the body, along with their water metabolism, regulation and biomedical significance of water.	2	Emp, S
CO2	Students should be able to learn about metabolic role of carbohydrates	3	Emp, S
CO3	Students should be able to learn about the metabolic role of lipids	3	Emp, S
CO4	Students should be able to learn about the metabolic role of proteins	2	Emp, S
CO5	Students should be able to acquire knowledge about the biological oxidation.	2	Emp, S

CO-PO Mapping ND3206

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	1	3	2	1	3	2	1	2	1	3	2	3	1
CO 2	1	3	2	1	3	2	2	2	1	3	2	3	2
CO 3	2	3	2	2	3	2	1	2	1	3	2	3	0
CO 4	2	3	2	2	3	1	1	2	1	3	2	3	2
CO 5	2	3	2	2	3	1	2	2	1	3	2	3	1
Avg	**1.6**	**3**	**2**	**1.6**	**3**	**1.6**	**1.4**	**2**	**1**	**3**	**2**	**3**	**1.2**

ND3245	Title: Nutritional Biochemistry Lab	LTPC 0 0 2 1
VersionNo.	1.0	
CoursePrerequisites	NIL	
Objectives	To impart fundamental knowledge of basic Biochemistry	
ExpectedOutcome	The students will be able to measure and weigh dry ingredients and liquids.	

List of Experiments

1. Extraction of casein from milk
2. Identification of carbohydrates (Qualitative tests)
3. Identification of Protein (Qualitative tests)
4. Determination of Iodine value of fat/oils
5. Determination of the saponification number of fat/oils
6. Determination of acid value of fat/oils
7. Separation of amino acid by paper chromatography
8. Extraction of starch from potato.
9. Estimation of Ascorbic Acid from Citrus Fruits.
10. Estimation of milk calcium.

ModeofEvaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course outcomes for ND3245

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ entrepreneurship (en)/ None (*Use , for more than One*)
CO1	Students should be able to learn about extraction of casein and calcium from milk sample.	3	Emp, S
CO2	Students should be able to learn about qualitative estimation of macromolecules such as proteins, fats and carbohydrates etc.	3	S
CO3	Students should be able to learn about estimation of ascorbic acid from citrus fruits.	3	Emp, S

CO-PO Mapping for ND3245

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	3	2	1	3	3	0	3	2	1	3	3	2
CO 2	2	3	2	1	2	3	2	2	2	2	2	3	2
CO 3	2	3	1	2	1	3	1	1	0	3	1	3	2
Avg	**2**	**3**	**1.6**	**1.3**	**2**	**3**	**1**	**2**	**1.3**	**2**	**2**	**3**	**2**

ND3205	Title: Fundamentals of Foods & Nutrition II	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview the concept of Nutrition	
Expected Outcome	The student would be able to understand the concept of different nutrients and its sources.	
Unit No.		No. of hours (per Unit)
Unit I	Minerals	7
Introduction of Macro (Na, K, Ca, Mg, P) minerals, Introduction of micro mineral (Fe, I, F, Zn, Cu, Co, Se, Cr. Mn, Mo, Ni, Sn, Si, V), Introduction of trace elements (Pb, Hg, B, Bo, Al), BiochemicalFunctions of micro, macro & trace elements, Food Sources, Bioavailability& RDA, Deficiency, toxicity, causes and consequences. Introduction to trace elements, classification, sources of trace elements.		
Unit II	Vitamins	7
Introduction of vitamins, Classification, Water soluble vitamins (Vit-B1, B2, B3, B5, B6, B7, B9, B12 & Vit-C), Fat soluble vitamins (Vit-A,D,E & K), Functions, Physiological role,bioavailability, RDA, Food sources, Deficiency & Disorders, toxicity, biochemical functions.		
Unit III	Food Sanitation and Hygiene	7
Introduction, principles of food hygiene. Introduction to toxicants, classifications, Natural toxicants in food, Toxicant due to contamination of food with harmful bacteria, fungi, parasites, insects and rodents, Hygiene and sanitation preparation, Pesticide residue, Adulterants, Impact on human health, Prevention & control.		
Unit IV	Nutrition in Sports	8
Introduction to sports nutrition, History, Organizations working for sports nutrition , Importance of nutrition in sports , Goals of optimal nutrition for athletes ,RDA and energy requirements,Role of macro (Carbohydrate, fat, protein) nutrients, Role of micro nutrients (minerals & vitamins), Role of water /electrolytes, Substrate for exercises , Regime of hydration and dehydration , Merits and demerits of protein supplements, Balanced diet for athletes ,Nutrition recommendations for sport person in pre exercise, during and post exercise.Introduction to diet related problems of athletes.		
Unit V	Energy	7
Introduction and concepts,energy and its balance, Energy intake, Basics about Energy generating pathways-(Glycolysis, TCACycle), Basal metabolism, BMR affecting factors, Requirement determination,Calculation and estimation,RDAand Energy requirement of different age group.		
Text Books	1. Shubhangini A. Joshi, "Nutrition and Dietetics" TataMc Grow- Hill publishing Company Ltd, NewDelhi. 2. Srilakshmi. B – "Nutrition Science", New Age International 3. Satyanarayana.U (2005), Biochemistry, Uppala Author-Publisher Interlinks,Vijayavada,A.	
Reference Books	1. Passmone R and Eastwood M.A, "Human Nutrition and Dietetics", English languagebook Society/Churchill Livingstone, HongKong. 2. Neiman N. Catherine, "Nutrition", Wm .C. Brown Publishers	

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course outcomes for ND3205

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/Entrepreneurship(Ent)/None (use, for more than one)
CO1	Students should be able to learn about the importance and functions of macronutrients and micronutrients along with their deficiencies.	6	Emp,S
CO2	Students should be able to learn about classification, importance and food sources for various fat soluble and water-soluble vitamins.	6	S.Emp, Ent
CO3	Students should learn about food hygiene and sanitation. Various methods to control and prevent food from toxicants.	6	Emp,S, Ent
CO4	Students should learn about importance of macro-nutrients and micronutrients in sports.	5	Emp
CO5	Students should be able to learn about energy generating pathways along with BMR affecting factors.	5	Emp

CO-PO Mapping for ND3205

Course Outcomes	Program Outcomes (Course Articulation Matrix(Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	2	3	3	0	2	3	3	0	3	3	3	1
CO2	0	2	2	2	2	3	0	3	2	0	0	3	3
CO3	3	2	0	2	3	3	0	2	1	1	1	2	3
CO4	1	2	2	0	3	1	2	3	2	0	2	0	2
CO5	3	2	1	3	0	1	3	2	2	3	0	3	3
AVEG.	1.8	2	1.6	2	1.6	2	1.6	2.6	1.4	1.4	1.2	2.2	2.4

ND3244	Title: Fundamental of Foods and Nutrition Lab II	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart practical knowledge of nutrients, present in different food products.	
Expected Outcome	The students will be able to learn about different sources and their standard values	

List of Experiments

1. Use and care of kitchen equipment's.
2. Rich Sources of VITAMINS price list, nutrition and labeling.
3. Rich Sources of MINERALS price list, nutrition and labeling.
4. Food Preparation of Vitamins & Minerals rich foods with 1/3 requirement of RDA's also alculate the calorie value.
5. Controlling techniques – Weights and measures standard, household measures for raw and cooked food.
6. Food preparation and classifying recipes as good, moderate or poor, sources of specific nutrients. Amount of ingredients to be in standard recipe –
(a) portion size
(b) Beverages – tea, coffee, cocoa, fruit juice, milk, milk shakes etc.
7. Estimation of BMR and other nutritional status parameters.
8. Survey of the SUPPLEMENTS that are available in market for sports person.
9. Prepare Protein and Energy Rich snack for sports person with minerals & Vitamins

Mode of Evaluation	
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course outcomes for ND3244

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/Entrepreneurship (Ent)/None (use, for more than one)
CO1	Students should able to learn about rich sources nutrients price list, nutrition and labelling.	6	Emp,S
CO2	Students should be able to learn about use and care of kitchen equipment's.	6	S.Emp, Ent
CO3	Students should able to prepare recipes as good, moderate and poor along with sources of specific nutrients.	6	Emp,S, Ent

CO-PO Mapping for ND3244

Course Outcomes	Program Outcomes Course Articulation Matrix (Highly Mapped- 3moderate-2,Low-1,Notrelated-0)										Program Specific Outcomes		
	PO1	PO 2	PO 3	PO4	PO 5	PO6	PO7	PO 8	PO 9	PO10	PSO1	PSO2	PSO3
CO1	3	1	1	2	1	1	2	2	0	2	0	2	2
CO2	3	3	2	3	2	1	2	3	3	2	3	2	3
CO3	0	3	1	1	3	3	2	1	2	0	3	0	2
AVEG.	1.5	2.3	1.3	2	2	1.6	2	2	1.6	1.3	2	1.3	2.3

HU3201	**Title: Indian Knowledge System**	**L T P C** **1 0 0 1**
Version No.	**1.0**	
Course Prerequisites	Nil	
Objectives		
Unit Nos.	**Unit Title**	**Number of hours (Per Unit)**
Unit 1	**Overview of IKS**	2
Survey of IKS Domains: A broad overview of disciplines included in the IKS, and historical developments. Sources of IKS knowledge, classification of IKS texts, a survey of available primary texts, translated primary texts, and secondary resource materials. Differences between a sutra, bhashya, karika, and vartika texts. Fourteen/eighteen vidyasthanas, tantrayukti		
Unit 2	**Vocabulary of IKS**	2
Introduction to Panchamahabhutas, concept of a sutra, introduction to the concepts of non-translatable (Ex. dharma, punya, aatma, karma, yagna, shakti, varna, jaati, moksha,loka, daana, itihaasa, puraana etc.) and importance of using the proper terminology. Terms such as praja, janata, loktantra, prajatantra, ganatantra, swarjya, surajya, rashtra, desh,		
Unit 3	**Philosophical foundations and Methods of IKS**	3
Philosophical foundations of IKS: Introduction to Samkhya, vaisheshika and Nyaya Methods in IKS: Introduction to the concept of building and testing hypothesis using the methods of tantrayukti. Introduction to pramanas and their validity, upapatti; Standards of argumentation in the vada traditions (introduction to concepts of vaada, samvaada, vivaada, jalpa, vitanda). Concept of poorvapaksha, uttarapaksha		
Unit 4	**Case Studies**	2
• Mathematics of Madhava, Nilakantha Somayaji • Astronomical models of Aryabhata • Wootz steel, Aranumula Mirrors, and lost wax process for bronze castings • Foundational aspects of Ayurveda • Foundational aspects of Ashtanga yoga • Foundational aspects of Sangeeta and Natya shastra		
Unit 5	**India and the World**	3
Influence of IKS on the world, knowledge exchanges with other classical civilizations, and inter-civilizational exchanges.		
Reference Books	• An Introduction to Indian Knowledge Systems: Concepts and Applications, B Mahadevan, V R Bhat, and Nagendra Pavana R N; 2022 (Prentice Hall of India). • Indian Knowledge Systems: Vol I and II, Kapil Kapoor and A K Singh; 2005 (D.K. Print World Ltd). • The Beautiful Tree: Indigenous India Education in the Eighteenth Century, Dharampal, Biblia Impex, New Delhi, 1983. Reprinted by Keerthi Publishing House Pvt Ltd., Coimbatore, 1995. • Indian Science and Technology in the Eighteenth Century, Dharampal. Delhi: Impex India, 1971. The British Journal for the History of Science. • The Wonder That Was India, Arthur Llewellyn Basham, 1954, Sidgwick& Jackson. • The India they saw series (foreigner visitors on India in history from 5CE to 17th century), Ed. Meenakshi Jain and Sandhya Jain, Prabhat Prakashan	
Mode of Evaluation	Internal and External Examination	
Recommended by the Board of Studies on	31-05-2022	
Date of approval by the Academic Council on	20-10-2022	

Course Outcome for HU3201

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp.)/ Skill(S)/ Entrepreneurship (Ent.)/ None (*Use , for more than One*)
CO1	The students will be able to understand the Indian Knowledge System such as historical development, sources and scope.	2	S
CO2	The students will be able to understand the vocabulary system of Indian knowledge system.	2	S
CO3	The students will be able to understand and apply the philosophical foundations and methods of IKS.	3	N
CO4	The students will be able to execute the case studies based on the Indian knowledge system.	3	N
CO5	The students will be able to understand the influence of Indian Knowledge System on world.	2	S

CO-PO Mapping for HU3201

Course Outco mes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3, Moderate- 2, Low-1, Not related-0)											Program Specific Outcomes		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
CO 1	0	1	3	1	2	1	1	1	0	0	3	1	1	1
CO 2	3	2	3	3	2	2	1	3	0	0	3	2	1	3
CO 3	1	1	2	2	1	1	1	1	0	0	3	1	1	1
CO 4	1	1	2	1	1	1	1	1	0	0	3	1	1	1
CO 5	1	1	2	1	1	1	1	1	0	0	3	1	1	1
Avg	**1.2**	**1.2**	**2.4**	**2**	**1.4**	**1.2**	**1**	**1.4**	**0**	**0**	**3**	**1.2**	**1**	**1.4**

CE3102	Title: Disaster Preparedness and Management	L T P 2 0 0 2
Version No.	1.0	
Course Prerequisites	Nil	
Objectives	The course is intended to provide a general concept in the dimensions of disasters caused by nature beyond the human control as well as the disasters and environmental hazards induced by human activities with emphasis on disaster preparedness, response and recovery.	
Expected Outcome	● Student should be able understand the concept and type of disaster ● Student should be able to understand classification, causes and impact of disaster ● Student should be able to understand approaches of disaster risk reduction ● Student should be able to understand inter-relationship between disasters and development: ● Student should be able to understand disaster risk management in India	
Unit No.	Unit Title	No. of hours (per Unit)
Unit: 1	Introduction to Disasters:	5
Concepts, and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks)		
Unit II	Disasters: Classification, Causes, Impacts	4
(including social, economic, political, environmental, health, psychosocial, etc.) Differential impacts- in terms of caste, class, gender, age, location, disability Global trends in disasteis!urban disasters, pandemics, complex emergencies, Climate change		
Unit III	Approaches to Disaster Risk reduction	5
Disaster cycle - its analysis, Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural-nonstructural nesures, roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), states, Centre, and other stake-holders..		
Unit IV	Inter-relationship between Disasters and Development:	5
Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc. Climate Change Adaptation. Relevance of indigenous knowledge, appropriate technology and local resources		
Unit V	Disaster Risk Management in India	5
Hazard and Vulnerability profile of India Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management Institutional arrangements (Mitigation, Response and Preparedness, DM Act and Policy, Other related policies, plans, programmes and legislation)		
Text Books	1. Bhattacharya, Disaster Science and Management, McGraw Hill Education Pvt. Ltd.	
Reference Books	1. Dr. Mrinalini Pandey, Disaster Management, Wiley India Pvt. Ltd. 2. Jagbir Singh, Disaster Management: Future Challenges and Opportunities, K W Publishers Pvt. Ltd.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31/05/2022	
Date of approval by the Academic Council	20.10.2022	

Course Outcome for CE3102

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp.)/ Skill(S)/ Entrepreneurship (Ent.)/ None (*Use , for more than One*)
CO1	The students will be able to understand the Indian Knowledge System such as historical development, sources and scope.	2	S
CO2	The students will be able to understand the vocabulary system of Indian knowledge system.	2	S
CO3	The students will be able to understand and apply the philosophical foundations and methods of IKS.	3	N
CO4	The students will be able to execute the case studies based on the Indian knowledge system.	3	N
CO5	The students will be able to understand the influence of Indian Knowledge System on world.	2	S

CO-PO Mapping for CE3102

Course Outco mes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3, Moderate- 2, Low-1, Not related-0)											Program Specific Outcomes		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PSO 1	PSO 2	PSO 3
CO 1	0	1	3	1	2	1	1	1	0	0	3	1	1	1
CO 2	3	2	3	3	2	2	1	3	0	0	3	2	1	3
CO 3	1	1	2	2	1	1	1	1	0	0	3	1	1	1
CO 4	1	1	2	1	1	1	1	1	0	0	3	1	1	1
CO 5	1	1	2	1	1	1	1	1	0	0	3	1	1	1
Avg	**1.2**	**1.2**	**2.4**	**2**	**1.4**	**1.2**	**1**	**1.4**	**0**	**0**	**3**	**1.2**	**1**	**1.4**

SEMESTER 3

ND3301	Title: Basic Dietetics- I	L T P C 4 0 0 4
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of therapeutic Nutrition.	
Expected Outcome	The student would acquire knowledge related to different diets and its effect on human body.	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Introduction to term Dietician	8
Definition of Dietician • Educational Qualification of Dietician • Difference between registered dietician & Nutritionist • tools used by dietician • Area of work Role of dietician in hospital :- work area of hospital dietician • role of hospital dietician Role of dietician in community :- work area of community dietician • role of community dietician		
Unit II	Nutrition Care Process	8
Introduction to Nutrition Care Process -Definition of Nutrition Care Process • Steps of Nutrition Care Process Nutrition Assessment:-Definition • Nutrition assessment component • Critical thinking Nutrition Diagnosis:- nutrition diagnosis domain:- intake, clinical, behavioral – environmental • Nutrition diagnosis component• nutrition vs. medical diagnosis Nutrition Interventions:- Definition, objectives, Nutrition Monitoring & Evaluation :- Definition • Nutrition monitoring & evaluation components • nutrition goals & objectives • evaluation of nutrition care		
Unit III	Principles of Diet therapy	8
Principles of Diet Therapy, Definition of Diet therapy, Concepts & Objectives of diet therapy Introduction to Therapeutic Nutrition, Definition of therapeutic nutrition • objectives of therapeutic diet • therapeuticnutrition for changing need. Therapeutic Adaptation of Normal Diet Definition of therapeutic diet • therapeutic adaption:- change in consistency• change in energy intake• change in nutrient• change in fiber • change in frequency of feeding• change in mode of feeding • change in elimination of food. Therapeutic Diet-Introduction to therapeutic diet • Modification of normal diet• Routine Hospital Diet:- clear liquid diet• liquid diet• semi-solid diet• soft diet• normal diet• tube feed• PEG feed• JJ feed• bland diet• high & low calorie diet• high & low protein diet• high & low fiber diet • low cholesterol diet		
Unit IV	Diet in Infection	8
Infection :- Nutrient & immune response during infection• Metabolic changes during infection• Nutritional management in infection, Fever:-classification of fever • acute fever • chronic fever • Metabolic changes during fever, Acute fever:- Typhoid:- introduction • prevalence• mode of transmission • signs & symptoms • stages of fever • complications• dietary modification, Chronic fever:- Tuberculosis:- introduction • prevalence• mode of transmission • signs & symptoms • stages of fever • complications• dietary modification		
Unit V	Diet for Gastro -Diseases	8
Diet for Gastro:-Introduction to gastrointestinal disease • classification of disease• Gastrointestinal Disease:- Diarrhea:- introduction • types of diarrhea• signs & symptoms • dietary modification Constipation:- introduction • types of constipation• signs & symptoms • dietary modification Peptic Ulcers:- introduction • types of peptic ulcers• signs & symptoms• complications. dietary modification		

Text Books	1. Antia F.P "Clinical dietetics and Nutrition", Oxford University press. 2. Srilakshmi: "Dietetics", New Age International (P) Ltd, Publishers, Pune.
Reference Books	1. Mahan, L.K. and Escott-Stump, S., Krause's Food, Nutritionand Diet Therapy, W.B.Saunders Company, London. 2. Williams S.R.: Nutrition and Diet Therapy, 7th Ed. Times Mirror / Mosby College Publishing, St. Louis
Mode of Evaluation	Internal & External
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome for ND3301

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the different tools, skills, ethics, and responsibilities of a dietitian as well as their work in different areas.	2	S
CO2	Students should be able to learn about Nutrition care process and its importance in medical nutrition therapy.	2	Emp
CO3	Students should be able to learn about different types of hospital diet and which type of diet in given to which patients.	2	Emp
CO4	Students should be able to learn about infections and its effects on the nutritional status of the body as well as about its nutritional intervention.	3	S
CO5	Students should be able to learn about various symptoms of gastrointestinal problems and how to management them with dietary modification	3	Emp

CO-PO Mapping for ND3301

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	1	0	0	1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	3	2	2	2	3	1	3	3	3	3
CO 3	3	3	3	3	2	3	1	3	1	3	3	3	3
CO 4	3	3	1	2	2	2	2	2	1	2	2	3	2
CO 5	3	3	1	2	2	2	2	2	1	2	2	3	2
Avg	**2.6**	**2.4**	**1.6**	**2.2**	**2.2**	**2.4**	**1.8**	**2.2**	**1.4**	**2.2**	**2**	**2.6**	**2.2**

ND3340	Title: Basic Dietetics Lab I	L T P C 0 0 4 2
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of therapeutic Nutrition.	
Expected Outcome	The student would acquire knowledge related to different diets and its effect on human body.	

List of Experiments

1. Planning, preparation and calculation of following diets: Normal diet, clear liquid and liquid diet, soft diet, Tube feed
2. Planning, preparation and calculation of Typhoid
3. Planning, preparation and calculation of Tuberculosis
4. Planning, preparation and calculation of Diarrhea
5. Planning, preparation and calculation of Constipation
6. Planning, preparation and calculation of Peptic Ulcer

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome for ND3340

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn to plan various types of therapeutic diets used in hospitals.	6	Emp
CO2	Students should be able to learn to plan and prepare therapeutic diets for various basic diseases like Diarrhoea, constipation, peptic Ulcers and different types of Fevers.	6	Emp
CO3	Students should be able to learn to calculate RDA,s according to individual patients for various basic diseases like Diarrhoea, constipation, peptic Ulcers and different types of Fevers	3	Emp

CO-PO Mapping for ND3340

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	3	3	2	3	1	3	1	2	3	3	3	3	2
CO 2	3	3	2	2	1	3	2	2	3	3	2	3	2
CO 3	3	3	2	2	1	3	2	2	3	3	2	3	2
Avg	**3**	**3**	**2**	**2.3**	**1**	**3**	**1.6**	**2**	**3**	**3**	**2.3**	**3**	**2**

ND3305	Title: Food Science	L T P C 4 0 04
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food.	
Expected Outcome	The student would acquire different sources of food products andtheir storage requirements.	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Introduction of foods& Cereals	9
Definition, functions, food-groups, classification of foods. Study of different cooking methods, merits and demerits, Solar-cooking, Microwave cooking. Cereals-Cereal sand millets-breakfast cereals, cereal products, fast-foods. Value added cereals available in Uttarakhand area.		
Unit II	Pulses	9
Pulses and legumes-Production (in brief), Selection and variety, storage, processing, use in variety of preparation, nutritional aspects and cost. Highlighting soya beans, lathyrism-removal of toxins. . Value added pulses & legumes available in Uttarakhand area.		
Unit III	Milk and Milk Products	10
Composition, classification, quality, processing, coagulation of milk, digestion of milk, storage, uses and cost. Nutritional aspects of milk, curd, butter, paneer, khoa, cheese, ice cream, kulfi and various kinds of processed milk.		
Unit IV	Egg, Fish, Poultry and Meat	10
Selection, quality, purchase, storage, uses and nutritional aspects. Spoilage of egg, fish, poultry and meat.		
Unit V	Fruits& Vegetables	10
Variety, selection, purchase, storage, availability, cost, use and nutritional aspects of raw and processed vegetables and fruits. Effects of cooking on colour, texture, flavour, appearance and nutritive value.Value added fruits & vegetables available in Uttarakhand area.		
Text Books	1. Swaminathan: "Food & Nutrition", The Bangalore Printing & publishing co ltd., Vol I, Bangalore. 2. Srilakshmi: "Food Science", New Age International (P) Ltd, Publishers,Pune.	
Reference Books	1. Mudambi .R. Sumathi&Rajagpal M.V, "Foods & Nutrition", Willey EasternLtd, NewDelhi. 2. Thangam.E.Philip: Modern Cookery, Orient Longman, Vol II,Bombay.	
Mode of Evaluation	Internal & External	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course outcomes for ND3305

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/Entrepreneurship(Ent)/None (use, for more than one)
CO1	Students should be able to learn about the nutritional importance of cereals, also learn about various new technologies of baking used in cereal products making.	3	Emp, S
CO2	Students should be able to learn about the nutritional importance of legumes and various technologies used in processing legumes	3	Emp, S
CO3	Students should be able to learn about the nutritional importance of milk and milk products and various new technologies used in processing of milk and milk products.	2	Emp, S
CO4	Students should be able to learn about classification and new technologies of fruits & vegetables and their products	3	Emp, S
CO5	Students should be able to learn about various processing & preservation techniques of food.	3	Emp, S

CO-PO Mapping for ND3305

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	0	2	1	0	3	1	0	2	2	1	3	2
CO2	2	2	2	2	1	2	0	2	1	1	1	0	0
CO3	2	3	3	1	1	1	1	1	2	1	3	2	2
CO4	1	1	0	2	1	3	1	2	0	3	3	2	2
CO5	0	1	1	1	2	0	1	2	2	2	2	0	3
Avg	1.6	1.4	1.6	1.4	1	1.8	0.8	1.4	1.4	1.8	2	1.4	1.8

ND3341	Title: Food Science Lab	L T P C 0 0 3 2
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To impart fundamental knowledge on the Food Sciences.	
Expected Outcome	The students will be able to measuring and weighing dry ingredients and liquids, cook and serve.	
Experiment No.	List of Experiments	

1. Familiarization with different stoves, ovens and simple kitchen equipment.

2. Methods of measuring and weighing dry ingredients and liquids.

3. Cereal cookery

a). Methods of combining flour with liquid eg. Powdered cereal coarse (eg.Phirne, broken wheat upma) and fine (eg. Ragi porridge, wheat halwa).
b). Cereal Grains – different methods of cooking rice – straining, absorption – cooking over slow heat, pressure cooking, addition of fat, microwave and rice cooker.
c). Rice preparations – lime rice, tamarind rice, coconut rice, curd rice, egg fried rice, peas fried rice, idli and dosa.Wheat and ragi preparations – Kesari, poori, paratha, bhathura, naan, ragi, putu, ragi leaf cake,ragiadai.
d). Cereals Cookery available in Uttarakhand area

4. Pulse Cookery
a). Different methods of cooking pulses – hard water, soft water, soaking, addition of soda bicarbonate, addition of raw papaya, pressure cooking eg. Any whole gram and any dhal.
b). Pulse Preparations – brinjal sambar, sprouted green gram, cow peas and chole.
c.) Pulses Cookery available in Uttarakhand area

5. VegetableCookery

a.) aDifferent methods of cooking vegetables effect of shredding, dicing, acid and alkali, pressure cooking, steaming with and without lid .Eg .Potato, beetroot, carrot and greens.

b.) Vegetable preparations –potato methi curry, mashed potatoes, aloo-tikke, vegetable korma, cabbage, carrot cucumber, ridge-gourd, tomato chutney and carrot halwa.

c.) Fruits Different ways of serving oranges, stuffed dates, banana fritters, fruit salad, stewed apricots, banana with custard, fruit jelly, grape jam, fruit punch, baked apple and pineapple upside down cake.

d.) Native fruits & vegetables cookery available in Uttarakhand area

6. Milk Cookery- Curd preparation, Paneer, Khoa and its usage in different sweets.
7. Egg Cookery- Quality assessment of egg, Preparation of soft boil & hard boil egg.

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course outcomes for ND3341

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/Entrepreneurship(Ent)/None (use, for more than one)
CO1	Student should be able to learn about various cooking methods.	3	Emp, S
CO2	Student should be able to learn about physical & chemical properties of different food grains.	3	Emp, S
CO3	Student should be able to learn about processing & preservation techniques for different food products.	3	Emp, S, Ent

CO-PO Mapping for ND3341

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	2	2	2	0	0	3	2	2	2	1	3	3
CO2	3	3	2	3	2	3	1	3	2	3	0	2	0
CO3	3	0	3	2	3	1	1	1	0	2	0	3	1
AVEG.	3	1.6	2.3	2.3	1.6	1.3	1.6	2	1.3	2.3	0.3	2.6	1.3

ND3303	Title: Food Microbiology I	L T P C 30 03
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food Microbiology.	
Expected Outcome	The student would acquire different sources of microorganisms and how they cause disease. And there beneficial effects	
Unit No.		No. of hours (per Unit)
Unit: I	Introduction and scope of Food microbiology	8
History & Introduction of microbiology and its relevance to everyday life. -General characteristics of bacteria, fungi, virus, protozoa, and algae. -Identification of microorganisms -Morphological characteristics important in food bacteriology -Industrial importance. Significance of Microorganisms in Foods. Methods for detection of microorganisms in food: Meat diary, sea foods, vegetables. Physical, Chemical Immunological and biochemical assays.		
Unit II	Growth Of Microorganisms	7
Growth curve -Intrinsic Factors (Substrate Limitations)-nutrient content, pH and buffering Capacity, antimicrobial barriers and, constituents, water Activity – Extrinsic Factors (Substrate Limitations)-relative Humidity, temperature, gaseous atmosphere Food Preservation &Principles of Quality ControlChemicals, Antibiotics, Bacteriocins.Applications of Probiotics and Prebiotics.		
Unit III	Microbiology of Deficient Food (Cereals, sugar & Vegetables)	7
Microbiology of deficient food (Spoilage. contamination sources, types, effect on cereals, sugar, vegetables and fruits)(a)Cereal and cereal products, b) Sugar and sugar products, c) Vegetables and fruits		
Unit IV	Microbiology of Deficient Food (Meat, Milk & Vegetables)	7
Microbiology of deficient food (Spoilage. contamination sources, types, effect on meat,egg, milk, canned foods)(a) Meat and meat products, b) Fish, egg and poultry, c)Milk and milk products, d) Canned foods		
Unit V	Environmental Microbiology	7
a) Water and water borne diseases, b) Air and air borne diseases, c) Soil and soil borne diseases, d) Sewage and diseases		
Text Books	1. William C Frazier “Food Microbiology”, McGraw Hill Education 2. WM Foster “Food Microbiology”, CBS	
Reference Books	1.Carl A. Batt “Encyclopedia of Food Microbiology” Elsevier 2.F.H.Kayser “Medical Microbiology” Stuttgart: Thieme	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3303

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the history and thegeneral characteristics of different classes of microorganisms. Beside the students will learn about the significance of microorganisms in food.	2	S
CO2	Students should be able to acquire knowledge about the growth curve of microorganisms even with the external and internal factors that affect the growth rate of microorganisms.	2	S
CO3	Students should be able to learn about the spoilage, contamination and prevention of cereals and cereals products.	2	Emp
CO4	Students should be able to learn about the spoilage, contamination and prevention of fruits & vegetables along with canned foods.	2	Emp
CO5	Students should be able to clear the concept about the environmental microbiology by studying the factors of environments such as air, water, soil and sewage.	2	Emp

CO-PO Mapping for ND3303

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	2	1	3	2	3	2	3	2	3	2	2	2	1
CO 2	2	2	3	2	3	1	2	3	3	2	3	1	2
CO 3	3	2	2	2	2	3	2	3	3	2	0	2	3
CO 4	3	2	3	3	2	1	2	3	3	2	1	2	1
CO 5	3	3	3	3	1	2	1	2	3	2	1	2	1
Avg	**2.6**	**2**	**2.8**	**2.4**	**2.2**	**1.8**	**2**	**2.6**	**3**	**2**	**1.4**	**1.8**	**1.6**

ND3342	Title: Food Microbiology Lab I	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food Microbiology.	
Expected Outcome	The student would acquire different sources of microorganisms and how they cause disease. And their beneficial effects	
Experiment No.	List of Experiments	
1. Study of equipment's in a microbiology lab 2. Sterilization techniques 3. Staining of bacteria- gram positive & gram negative 4. Staining of endospore forming bacteria 5. Cultivation and identification of important bacteria, moulds		
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3342

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn various equipment used in food microbiology lab etc.	3	S
CO2	Students should be able to learn about staining techniques for bacteria such as gram staining etc.	4	Emp
CO3	Students should be able to also learn about Cultivation and identification of important bacteria, mouldsetc	5	Emp

CO-PO Mapping for ND3342

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	2	1	2	2	2	1	2	2	3	2	1	3	1
CO 2	2	2	3	2	3	2	3	3	3	1	2	2	3
CO 3	1	2	2	3	3	2	3	3	3	1	2	2	2
Avg	**1.6**	**1.6**	**2.3**	**2.3**	**2.3**	**1.6**	**2.3**	**2.3**	**3**	**1.3**	**1.6**	**2.3**	**2**

ND3304	**Title: Food Service Management I**	**L T P C** **3 0 0 3**
Version No.	**1.0**	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food.	
Expected Outcome	The student would acquire different sources of food products and their storage requirements.	
Unit No.		**No. of hours (per Unit)**
Unit: I	**Catering Industry- Definition& Classification**	7
Introduction, Classification of food service institutions according to , Function: Profit oriented, service oriented and public health facility oriented, Processing method: Conventional system, commissary system and fast food servicesystems, Service of food: Self-service, tray service and waiter-waitress service		
Unit II	**Floor planning and layout**	7
Floor planning and layout, Characteristics of typical food service facilities. Floor planning and layout for catering establishment. Characteristics of typical food service facilities.		
Unit III	**Catering Equipment**	7
Introduction, Classification, Factors involved in selection of equipment's. Factor involved in purchasing of equipments, Use and care of major equipment's.		
Unit IV	**Food Preparation**	8
Introduction, Principles of food preparation, Characteristics of food. Principles of food purchasing. Methods of food purchasing. Storages of foods		
Unit V	**Menu Planning**	7
Definition of menu planning, Principals & objectives of menu planning. Factor affecting menu planning. Types of menus. Steps to be considered during planning a menu. Advantage & disadvantage of menu.		
Text Books	1. Swaminathan: "Food & Nutrition", The Bangalore Printing & publishing co ltd., Vol I, Bangalore. 2. Srilakshmi: "Food Science", New Age International (P) Ltd, Publishers, Pune.	
Reference Books	1. Mudambi.R. Sumathi&Rajagpal M.V, "Foods & Nutrition", Willey Eastern Ltd, New Delhi. 2. ThangamE.Philip: Modern Cookery, Orient Longman, Vol II, Bombay.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3304

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the functions and classification of catering industry and various processing method which is used in catering industry	2	S
CO2	Students should be able to learn about the various types of floor planning and layouts for a good catering establishments and characteristics of typical food service facilities	3	S
CO3	Students should be able to learn about the catering equipment's and factors which involved in the selection and purchasing of equipment's.	3	Emp
CO4	Students should be able to learn about the principles of food preparation, food purchasing and how to store food for long time.	3	Emp
CO5	Students should be able to learn about the principles and objectives of menu planning which is very useful for any catering establishment.	4	Emp

CO-PO Mapping for ND3304

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	1	2	0	2	0	1	3	1	3	3	3	2	2
CO 2	2	0	2	3	3	2	2	0	3	2	0	1	3
CO 3	2	1	2	1	1	1	0	2	2	0	3	0	1
CO 4	1	0	3	1	2	3	2	3	0	3	1	3	2
CO 5	3	2	2	0	1	0	2	1	0	3	3	1	3
Avg	**1.8**	**1**	**1.8**	**1.4**	**1.4**	**1.4**	**1.8**	**1.4**	**1.6**	**2.2**	**2**	**1.4**	**2.2**

ND3343	Title: Food Service Management Lab I	L T P C 0 0 4 2
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food.	
Expected Outcome	The student would acquire different sources of food products and their storage requirements.	
Experiment No.	List of Experiments	
Standardization of at least 2 recipes in each of the following category • Cereal and cereal products • Vegetables. • Fruits. • Meat, chicken and other fleshy foods. • Sugar and jiggery • Milk and its products. • Pulses. • Nuts and Oil seeds.		
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3343

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the standardization techniques for different recipes.	5	S
CO2	Student should be able to gain knowledge about cost calculation for different standardized recipes.	3	S
CO3	Student should be able to gain knowledge about management techniques for catering establishment.	3	Emp

CO-PO Mapping for ND3343

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	3	3	1	3	1	3	2	0	2	3	3	3	0
CO 2	3	3	3	2	3	1	2	1	2	2	3	2	3
CO 3	2	1	2	2	3	1	2	3	0	0	2	2	2
Avg	**2.5**	**2.3**	**2**	**2.3**	**2.3**	**1.6**	**2**	**1.3**	**1.3**	**1.6**	**2.6**	**2.3**	**1.6**

HU3202	Title: United Nations Development Programme	L T P C 1 0 0 1
Version No.	1.0	
Course Prerequisites	Nil	
Objectives		
Unit Nos.	Unit Title	Number of hours (Per Unit)
Unit 1	Introduction	2
Introduction to UNDP, Mission and Vision of UNDP, Goals of UNDP, Structure of UNDP Executive Board and function of UNDP Board members, Expertise of UNDP, UNDP in India: Projects of UNDP in India.		
Unit 2	Sustainable Livelihoods	3
Vision and Strategy for Sustainable Livelihoods: Hill Agriculture / Horticulture, Tourism and Other avenues for generating Sustainable Livelihoods. Strategies for End of hunger, achieve food security and improved nutrition and promote sustainable agriculture Promote Sustained, Inclusive and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All. Build Resilient Infrastructure, Promote Inclusive and Sustainable Industrialization and Foster Innovation		
Unit 3	Human Development	2
Access and explore human development data for 191 countries and territories worldwide. Ensure healthy lives and promote well-being for all at all ages, Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities, Ensure availability and sustainable management of water and sanitation.		
Unit 4	Social Development	2
Achieve Gender Equality and Empower All Women and Girls, Reduce Inequality within and Among Countries, Promote Peaceful and Inclusive Societies for Sustainable Development, Provide Access to Justice to All and Build Effective, Accountable and Inclusive Institutions at All Levels		
Unit 5	Environmental Sustainability	3
Ensure access to affordable, reliable, sustainable and modern energy, Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable, Ensure Sustainable Consumption and Production Patterns, Urgent Action to Combat Climate Change and its Impacts, Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, and Halt and Reverse Land Degradation and Halt Biodiversity Loss.		
Reference Books	http://web.undp.org/evaluation/documents/Books/Evaluation_for_Agenda_2030.pdf Digambar Bhouraskar, 2014, United Nations Development Aid: A History of Undp, Academic Foundation Publisher, 230	
Mode of Evaluation	Internal and External Examination	
Recommended by the Board of Studies on	31-05-2022	
Date of approval by the Academic Council on	20-10-2022	

Course Outcome for HU3202

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp.)/ Skill(S)/ Entrepreneurship (Ent.)/ None (*Use , for more than One*)
CO1	Students will learn about the Structure, Mission, Vision and Goals of UNDP	2	S
CO2	Equip the students with the knowledge of sustainable livelihoods for inclusive economic growth.	2	S
CO3	Students will learn and explore about the Human Development index to promote well being at all ages.	2	S
CO4	To impart better education on SDGs goals focusing on Gender Equality and Provide Access to Justice to All and Build Effective.	3	N
CO5	Students will develop knowledge regarding environment sustainability.	3	N

CO-PO Mapping for HU3202

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)											Program Specific Outcomes		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PS O1	PS O2	PS O3
CO 1	0	2	3	0	3	3	0	3	0	0	3	1	2	3
CO 2	1	3	3	1	3	3	0	2	1	0	3	1	2	3
CO 3	1	2	2	1	3	3	0	3	1	0	3	1	2	3
CO 4	1	2	3	0	3	3	0	3	1	3	3	1	2	2
CO5	1	2	3	1	3	3	0	2	1	1	3	1	2	3
Avg	**0.8**	**2.2**	**2.8**	**0.6**	**3**	**3**	**0**	**2.6**	**0.8**	**0.8**	**3**	**1**	**2**	**2.8**

SEMESTER 4

ND3401	Title: **Basic Dietetics II**	L T PC 4 004
Version No.	**1.0**	
Course Prerequisites	NIL	
Objectives	To provide an over view of therapeutic Nutrition.	
UnitNo.	**UnitTitle**	No.of hours (perUnit)
UnitI	**Food Sensitivity**	8
Introduction• objectives •feeding technique:-enteral andparenteralfeeding technique psychologyofpatient onfeed•assessment ofpatient.		
UnitII	**Introduction of Renal Disease**	8
Nephritis :- introduction , manifestation ofdisease,causes, signs & symptoms , complications • dietarymodification **Nephrotic Syndrome :-** introductionmanifestation of diseaseprevalence of disease causes signs &symptoms complicationsdietary modification **Acute Renal Disease :-** introductionmanifestation of diseaseprevalence of disease causessigns & symptomscomplications dietary modification **Chronic Renal Disease :-**introductionmanifestation of diseaseprevalence of disease causessigns & symptoms complicationsdietarymodification**EndStageRenalDisease:**introductionmanifestationofdiseaseprevalenceofdiseasecausessigns &symptomscomplicationsdietarymodification.		
UnitIII	**Diet For Cardiovascular Diseases**	8
Dietforcardiovasculardisease-introduction•stagesofdevelopment•etiology•riskfactor•nutritionalmanagement		
UnitIV	**Diet in Diabetes Mellitus**	8
DietforDiabetesMellitus–introduction•classification-IDDM,NIDDM, GestationalDiabetesMellitus•etiology• prevalence•causes•riskfactor•signs&symptoms•nutritionalmanagement		
UnitV	**Diet for Weight Management**	8
Dietforobesity–introduction•assessmentofobesity•riskfactor•causes •hazardsofObesity•complications• Dietarymodifications Diet for Underweight: – introduction• nutritional assessment• risk factor• causes • hazards of leanness•complications•dietarymodifications		
TextBooks	1. AntiaF.P"Clinical dieteticsandNutrition",OxfordUniversitypress. 2. Srilakshmi:"Dietetics",New Age International(P) Ltd, Publishers,Pune.	
ReferenceBooks	1. Mahan, L.K. and Escott-Stump, S., Krause's Food, Nutritionand DietTherapy, W.B.SaundersCompany,London. 2. WilliamsS.R.:NutritionandDietTherapy,7th Ed.TimesMirror/MosbyCollegePublishing,St.Louis	
ModeofEvaluation	Internal&External	
Recommendation by Board Of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3401

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about different food allergens, how they cause allergy to sensitive people and their treatment.	2	Emp, S, Ent
CO2	Students should be able to learn about different types of renal disease and how we can prevent it by dietary intervention.	2	S, Emp, Ent
CO3	Students should be able to learn about different about different types of cardiovascular disease and how it can be prevented by dietary intervention	3	Emp, S, Ent
CO4	Students should be able to learn about different types of diabetes mellitus and its dietary intervention.	2	Emp, S, Ent
CO5	Students should be able to learn about different types of weight management diseases and how it can be prevented by dietary and lifestyle modification	2	Emp, S, Ent

CO-PO Mapping for ND3401

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	0	0	1	3	3	2	1	3	1	0	1	2
CO 2	2	3	3	3	2	2	2	2	3	1	3	3	3
CO 3	2	3	1	3	3	2	3	1	3	2	3	3	3
CO 4	3	2	3	2	2	3	2	2	2	1	2	2	3
CO 5	2	3	2	1	3	2	2	2	2	1	2	2	3
Avg	2	2.2	1.8	2	2.6	2.4	2.2	1.6	2.6	1.2	2	2.2	2.8

ND3440	Title: Basic Dietetics Lab II	LTPC 0 042
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of therapeutic Nutrition.	
Experiment No	List of Experiments	
Planning preparation and calculation of following diets: • Nephritis • Nephrotic Syndrome • Acute Renal Disease • Hypertension • Atherosclerosis • Diabetes Mellitus • Obesity • Underweight		
Modeof Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3440

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to plan therapeutic diets for various basic diseases like Allergy, Diabetes, Renal Disease, CHD, Weight management	6	Emp, S, Ent
CO2	Students should be able to prepare therapeutic diets for various basic diseases like Allergy, Diabetes, Renal Disease, CHD, Weight management	6	S,Emp, Ent
CO3	Students should be able to calculate RDA,s according to individual patients for various basic diseases like Allergy, Diabetes, Renal Disease, CHD, Weight management	3	Emp, Ent,S

CO-PO Mapping for ND3440

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate-2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	3	2	3	1	3	1	2	3	3	3	3	2
CO 2	3	3	2	2	1	3	2	2	3	3	2	3	2
CO 3	3	3	2	2	1	3	2	2	3	3	2	3	2
Avg	**3**	**3**	**2**	**2.3**	**1**	**3**	**1.6**	**2**	**2**	**2**	**2.3**	**3**	**2**

ND3405	**Title: Food Science I**	**L T P C** **4 0 0 4**
Version No.	**1.0**	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food.	
Expected Outcome	The student would acquire different sources of food products and their storage requirements.	
Unit No.		**No. of hours (per Unit)**
Unit: I	**Beverages**	8
Classification, Coffee, Tea, Cocoa, Fruit & vegetable beverages, Alcoholic & non-Alcoholic beverages. Processing composition and preparation.		
Unit II	**Nuts, Oil seeds and Fats & oils**	7
Composition and Nutritive value, Specific nuts & oilseeds, Toxins, Role of nuts & oilseeds in cookery. Nutritional importance, composition, Types, Smoking point, Rancidity, effect of heating, Role of fat/oil in cookery		
Unit III	**Spices and Condiments**	7
Spices & condiments- Types, composition, Importance, Classification, Role in cookery		
Unit IV	**Sugar and Related Products**	7
Nutritive value, Properties, Form of sugar and liquid sweetness, Caramelization, Hydrolysis, Crystallization, Role in Indian confectionery		
Unit V	**Food Additives, preservatives & adulteration**	7
Definition, functions and laws & regulation related to use of food additives, Definition and classification of food adulteration & preservatives, types and laws and regulations.		
Text Books	1. Swaminathan: "Food & Nutrition", The Bangalore Printing & publishing co ltd., Vol I, Bangalore. 2. Srilakshmi: "Food Science	
Reference Books	1. Mudambi .R. Sumathi&Rajagpal M.V, "Foods & Nutrition", Willey Eastern Ltd, New Delhi. 2. Thangam.E.Philip: Modern Cookery	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by . the Academic Council	20-10-2022	

Course Outcome for ND3405

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the nutritional importance of cereals, also learn about various new technologies of baking used in cereal products making	2	S
CO2	Students should be able to learn about the nutritional importance of legumes and various technologies used in processing legumes	2	S
CO3	Students should be able to learn about the nutritional importance of milk and milk products and various new technologies used in processing of milk and milk products	2	Emp
CO4	Students should be able to learn about classification and new technologies of fruits & vegetables and their products	2	Emp
CO5	tudents should be able to learn about various processing & preservation techniques of food.	2	Emp

CO-PO Mapping for ND3405

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate-2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	2	1	3	3	1	2	1	3	2	3	1	3	3
CO 2	2	2	3	3	1	2	1	3	2	3	1	3	3
CO 3	2	2	3	3	1	2	1	3	2	3	1	3	3
CO 4	3	2	1	1	1	3	1	1	1	3	2	3	2
CO 5	1	2	3	3	1	2	1	3	2	3	2	3	3
Avg	**2**	**1.8**	**2.6**	**2.6**	**1**	**2**	**1**	**2.6**	**1.8**	**3**	**1.4**	**3**	**2.8**

ND3444	Title: Food Science I Lab	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food.	
Expected Outcome	The student would acquire different sources of food products and their storage requirements.	

List of Experiments

1. Beverages-Prepare tea and coffee by different methods and compare. Prepare & serve stimulating, nourishing, refreshing beverages & appetizers.
2. Prepare the recipes using nuts as sweets, chutneys, salads, snacks. Prepare recipes where nuts and oilseeds can be used as thickening agent and garnishing agent.
3. Prepare the recipes using nuts as sweets, chutneys, salads, snacks. Prepare recipes where nuts and oilseeds can be used as thickening agent and garnishing agent.
4. Prepare different recipes using spices as flavorings agents, colorings agents, preservative, souring agent, thickening agents etc
5. Demonstrate the different stages of crystallization in sugar cookery. Prepare recipes where sugar can be used in crystallization, non-crystallization, caramalisation,1-thread &3-thread sugar consistency is used.
6. Food preservation techniques (use of different techniques in product formulation and analysis of product for quality standards).
    a. Sun drying and dehydration
    b. Preservation with sugar-jams, jelly, preserves, etc.
    c. Preservation – salt, oil, vinegar-pickling.
    d. Preservation of foods using chemicals –tomato ketchup, squash

Mode of Evaluation	Internal and External Examinations
Recommendation by Board ofStudies on	31-05-2022
Date of approval by theAcademic Council	20-10-2022

Course Outcome for ND3444

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Student should be able to learn about various cooking methods.	2	Emp, S, Ent
CO2	Student should be able to learn about physical & chemical properties of different food grains.	2	Emp, S, Ent
CO3	Student should be able to learn about processing & preservation techniques for different food products.	2	Emp, S, Ent

CO-PO Mapping for ND3444

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	3	3	1	2	1	3	1	3	2	3	3	3	3
CO 2	2	3	1	2	1	1	1	3	2	3	2	3	3
CO 3	2	3	1	2	1	1	1	3	2	3	2	3	3
Avg	**2.3**	**3**	**1**	**2**	**1**	**1.6**	**1**	**3**	**2**	**3**	**2.3**	**3**	**3**

ND3403	**Title: Food Service Management II**	**LTPC 4 0 0 4**
VersionNo.	**1.0**	
CoursePrerequisites	NIL	
Objectives	To provide an overview of essential components of food.	
ExpectedOutcome	The student would acquire different sources of food products and their storage requirements.	
UnitNo.		**No. of hours (perUnit)**
UnitI	**Management**	7
Definition of management, Principles of management, Steps in effective management, Techniques of effective Management		
UnitII	**Tools of Management**	7
Tools of management, Organization chart, Work study, Work simplification, Work improvement		
UnitIII	**Financial Management**	7
Introduction, Principles, Costing, Budgeting, Accounting, Food cost control methods, Factors affecting food cost,l abor cost, operating cost and over head cost		
UnitIV	**Personnel Management**	8
Introduction, Personal management concepts, Staff employment, Employee benefits, Methods of selection, Orientation, Training & development, Supervision, Motivation of employees		
UnitV	**Standardization and standard portion of recipe**	7
Definition of standardization of recipe, Standard recipe format and uses, Definition of Standard portion size, portioning equipment's, Portion control, Use of left over foods		
TextBooks	1.Swaminathan:"Food&Nutrition",TheBangalorePrinting&publishingcoltd.Vol I Bangalore. 2 Srilakshmi: "FoodScience",NewAge International(P) Ltd, Publishers,Pune.	
ReferenceBooks	1Mudambi.R.Sumathi&RajagpalM.V,"Foods&Nutrition",WilleyEasternLtd,NewDelhi. 2.Thangam.E.Philip:ModernCookery,OrientLongman,VoIII,Bombay.	
ModeofEvaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by The Academic Council	20-10-2022	

Course Outcome for ND3403

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the management, principles of management and various techniques of effective management.	2	Emp, S, Ent
CO2	Students should be able to learn about the tools of management, work improvement, work simplification and various food cost control methods.	2	Emp, S, Ent
CO3	Students should be able to learn about financial management (costing, budgeting and accounting) and various food cost control methods.	2	Emp,S, Ent
CO4	Students should be able to learn about personnel management (staff employment, supervision, employee benefits and various method of selection).	2	Emp, S, Ent
CO5	Students should be able to learn about standardization of recipe and different format of standard recipe.	2	Emp, S, Ent

CO-PO Mapping for ND3403

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate-2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	1	1	2	2	1	1	3	1	3	0	2	2
CO 2	2	2	1	1	2	3	1	0	0	3	2	0	3
CO 3	0	3	3	1	1	1	3	2	2	3	1	1	1
CO 4	2	2	0	1	1	2	2	3	1	2	3	1	3
CO 5	0	3	1	1	1	3	0	0	0	0	3	1	3
Avg	**1**	**2.2**	**1**	**1.2**	**1.4**	**2**	**1.4**	**1.6**	**0.8**	**2.2**	**1.8**	**1**	**2.4**

ND3442	Title: Food Service Management II Lab	LTPC 0 0 4 2
VersionNo.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food.	
ExpectedOutcome	The student would acquire different sources of food products and their storage requirements.	

List of Experiments

I Planning and preparation of menu for various occasions and to calculate amount of each food ingredients
a) Birth-daymenu
b) Holi function menu
c) New year special menu
d) d)Wedding menu
e) Lhori special menu
f) Christmas special menu
II. Calculate foodcost, laborcost, operating cost and overhead cost of a home-madedish.
III. Calculategrossprofitpercentageofantestablishmentwelfare/commercial/transportcatering
IV. Calculatebreak-evenpointanyestablishmentwelfare/commercial/transportcatering
V Preparationofquantityrecipesfor20personswitha maindish,2sideaccompanimentsandadessert/soup.
VI Visits to catering establishment(Anyone) welfare/commercial/transport

Modeof Evaluation	Internal and External Examinations
Recommendation by Board ofStudies on	31-05-2022
Date of approval by theAcademic Council	20-10-2022

Course Outcome for ND3442

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the standardization techniques for different types of recipes at different occasions and to have inhouse training of quantity cooking.	6	Emp, S, Ent
CO2	Student should be able to gain knowledge about financial management for any catering establishment.	3	Emp, S, Ent
CO3	Students should be able to learn catering management in different establishments through visits.	3	Emp, S, Ent

CO-PO Mapping for ND3442

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate-2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	2	1	3	2	3	2	1	3	0	2	3	2
CO 2	1	2	2	3	1	3	2	2	2	1	2	3	2
CO 3	2	2	1	3	1	3	2	1	3	2	2	3	1
Avg	**1.6**	**2**	**1.3**	**3**	**1.3**	**3**	**2**	**1.3**	**2.6**	**1**	**2**	**3**	**1.6**

ND3404	**Title:Food Microbiology II**	**LTPC 3 003**
VersionNo.	**1.0**	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food Microbiology.	
Expected Outcome	The student would acquire different sources of microorganisms andhow the ycause disease.And their beneficial effects	
Unit No.		**No. of hours (perUnit)**
UnitI	**Waste Product Handling**	8
a) Planning for waste disposal, b) Solid wastes and liquid wastes. Waste treatment and disposal-Biological oxygendemand(BOD), Preliminarytreatments,Chemicaltreatment,Biologicaltreatmentanddisposal,Typesoffoodwastes		
Unit II	**Microbial intoxication and infections**	7
Sources of contamination of food, mycotoxins, toxin production and physiological action, sources of infection offood bypathogenic organisms, symptoms and method of control		
Unit III	**Beneficial effect of organism**	7
Some applications of microorganisms,Foodproduct-Alcoholicdrinks,Dairyproducts,Bread,Vinegar,Pickledfoods, Mushrooms & single-cell protein		
Unit IV	**Products from Microorganisms**	7
Productsfrommicro-organisms-enzymes,Aminoacids,Antibiotics,Citricacid.		
UnitV	**Relevance of Microbial standards for foodsafety**	7
Food Agricultural Organization (FAO), World Health Organization (WHO), The International Children'sEmergencyFund(UNICEF),CodexAlimentarius,TheInternational Commissionon Microbiological, Specifications for Foods(ICMSF), The Food and Drug Administration(FDA), United States Department ofAgriculture(USDA		
TextBooks	1. WilliamCFrazier"FoodMicrobiology",McGrawHillEducation 2. WMFoster"FoodMicrobiology",CBS	
ReferenceBooks	1.CarlA.Batt"EncyclopediaofFoodMicrobiology"Elsevier 2.F.H.Kayser "MedicalMicrobiology"Stuttgart:Thieme	
ModeofEvaluation	InternalandExternalExaminations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by The Academic Council	20-10-2022	

Course Outcome for ND3404

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to acquire knowledge about waste product handling by primary and secondary treatments even by biological treatments. Different types of food waste.	2	S
CO2	Students should be able to learn about various mycotoxins produced by different microorganisms, sources of infection, symptom and method of control.	4	S, Emp
CO3	Students should be able to learn about beneficial products made by microorganisms such as bread, alcoholic beverages, vinegar, pickled products etc.	2	Emp, S, Ent
CO4	Students should be able to learn about microbial growth curve and various microbial metabolites produced during growth pattern such as alcoholic beverages, bread and dairy products.	2	S
CO5	Students should be able to learn the various relevance of microbial standards for food safety such as Food agricultural organization(FAO), World health organization(WHO), The international commission on microbiological specifications for foods (ICMSF), etc.	2	Ent, Emp, S

CO-PO Mapping for ND 3404

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	1	1	3	0	3	3	2	2	2	3	0	3	2
CO 2	3	2	1	1	2	3	0	3	1	2	0	3	1
CO 3	0	2	3	1	0	2	2	3	3	3	1	2	3
CO 4	1	0	2	1	2	1	1	1	1	0	0	3	2
CO 5	0	0	0	3	3	2	0	0	2	2	0	0	1
Avg	1	1	1.8	1.2	2	2.2	1	1.8	1.8	2	0.2	2.2	1.8

ND3443	Title: Food Microbiology II Lab	LTPC 00 21
VersionNo.	1.0	
Course Prerequisites	NIL	
Objectives	To provide an overview of essential components of food Microbiology.	
ExpectedOutcome	The student would acquire different sources of microorganisms and how they cause disease .And there beneficial effects	
	List of Experiments	
1. Study of equipment's in a microbial lab 2. Preparation of laboratory media band special media, cultivation of bacteria. 3. Enumeration of microorganisms from spoil food samples 4. Methylene blue reduction test for milk sample 5. Preparation of wine from grapes 6. Growth Curve 7. Preparation of some traditional fermented products		
Modeof Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3443

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to prepare different culture media for microbes along with growth curve.	3	Emp, S
CO2	Students should be able to learn the enumeration of microorganisms from different spoil food samples/commodities etc.	3	S,Emp
CO3	Students should be able to learn to do various quality assessment test of milk and to learn morphological characteristics of microbes etc.	3	Emp, S

CO-PO Mapping for ND3443

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	2	1	3	2	3	2	1	3	0	2	3	2
CO 2	1	2	2	3	1	3	2	2	2	1	2	3	2
CO 3	2	2	1	3	1	3	2	1	3	2	2	3	1
Avg	**1.6**	**2**	**1.3**	**3**	**1.3**	**3**	**2**	**1.3**	**2.6**	**1**	**2**	**3**	**1.6**

SEMESTER 5

ND3501	Title: Community Nutrition I	L T P C 4 0 0 4
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Nutrition in Community	9
Community Nutrition: Introduction, Definition of community nutrition, Characteristic of community. Types of community . role of nutrition in community development,methods of improving nutritional quality. Modern Methods of Improving Nutritional Quality-Food Fortification- definition, methods,advantages, disadvantages Nutrient Supplementations:-introduction,types of supplement,advantages,disadvantages.Food Enrichment: -definition, methods,advantages, disadvantages. Nutrition education and messages in nutrition and health. AntenatalCare:-definition•importance•objectives•methods•nutritioneducation PostnatalCare.:-definition•importance•objectives •methods•nutritioneducation		
Unit II	Malnutrition	10
Malnutrition:-Introduction• definition of malnutrition • types of malnutrition • prevalence • causes • sign & symptoms of under nutrition •conditions caused by under nutrition • factors leading over nutrition • sign & symptoms of over nutrition • conditions caused by over nutrition. **NationalNutritionPolicy**: -Introduction•Aims of NNP •Nutrition policy instrument of NNP •Direct short-term Interventions• Indirect Policy instrument.		
Unit III	Nutritional Disorders	10
Introduction to Nutritional Disorders :-Introduction • definition • types of **Protein energy Malnutrition**:- introduction • epidemiology • classification• causes • risk factor • clinical features • prevention • dietary management **Nutritional Anemia**:- Introduction • epidemiology • causes • risk factor • clinical features • prevention • dietary management **Vitamin Deficiency Disorders** :- introduction • epidemiology •causes • risk factor • clinical features • prevention • dietary management		
Unit IV	Nutritional Assessment (Direct Method)	10
Nutritional Assessment :-Introduction • Definition • objectives • sampling technique• methods of assessment **Sampling Technique**:- Introduction • Definition • objectives • identification of risk group • sampling techniques **Methods of Nutritional Assessment** Introduction • Definition • objectives • Direct assessment • Indirect assessment **Direct assessment** – introduction• ABCD method **Anthropometric Method**:- Introduction• Definition • objectives• methods • advantages • disadvantages **Biochemical Method**:- Introduction • Definition •objectives • methods • advantages •disadvantages **Clinical Method**:- Introduction • Definition •objectives• methods • advantages •disadvantages **Dietary Method**:- Introduction • Definition• objectives• methods • advantages •disadvantages		
Unit V	Nutritional Assessment (Indirect Method)	9
Indirect assessment–Food balance sheet :- Introduction • Definition • objectives • methods • advantages • disadvantages **Ecological parameters:-** Introduction • Definition •objectives • methods • advantages •disadvantages **Vital statistics:-** Introduction • Definition • objectives • methods • advantages •disadvantages		

Text Book	1.S.D Manivannan," Community Health Nursing-I" CBC Publication. 2. Sharma S, Wadhwa A.," Nutrition in the Community- A textbook", Elite Publishing House Pvt. Ltd 3. Mudambi, SR and Rajagopal MV, "Fundamentals of Foods, Nutrition and Diet Therapy, 2012: Lakra P, Singh MD, "Textbook of Nutrition and Health; First Ed,2008, AdademicExcellance
Reference Books	1. Wardlaw GM, Hampl JS, "Persepective in Nutrition; Seventh Ed 2007; McGraw Hill. 2. Gibney et al. Public Health Nutrition,2004; Blackwell Publishing. 3. Mayer,J "Human Nutrition, Charles, C. Thomas, Spring field 4. Park's Textbook of Preventive and Social Medicine by Park. 1. Agarwal, "Textbook of Human Nutrition" Udipi
Mode of Evaluation	Internal & External
Recommendation by Board of Studies	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome forND3501

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about role of nutrition in maintaining health and solving various nutritional problems prevailing in India	3	Emp
CO2	Students should be able to learn about various forms of malnutrition in Indian community and how to overcome them in the society	2	S
CO3	Students should be able to learn about various nutritional disorders their preventions and positive outcomes	3	Emp
CO4	Students should be able to learn about various nutritional assessment techniques used in community	2	Emp, S, Ent
CO5	Students should be able to learn about indirect method of nutritional assessment used in community	3	S

CO-PO Mapping for ND3501

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	2	1	3	1	1	2	2	1	3	2	3	2	1
CO 2	3	1	3	1	2	2	1	1	3	2	3	1	2
CO 3	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 4	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 5	2	2	3	2	1	2	2	1	2	2	3	2	1
Avg	**2.6**	**1.4**	**2.8**	**1.4**	**1.2**	**2.2**	**1.6**	**1.2**	**2.4**	**1.8**	**3**	**1.6**	**1.4**

ND3540	Title: Community Nutrition I Lab	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Experiment No.	List of Experiments	

1. Assessment of Nutritional Status Through Anthropometric measurement
   a) Assessment of adiposity in adolescent with the help of BMI
   b) Assessment of body weight to reveal by using IAP method
   c) Assessment of nutritional status of given subjects using classification based on weight for height
   d) Assessment of nutritional status of children (0-2 years old) by Head chest circumference
   e) Assessment of nutritional status of children (0-2 years old) by MUAC
2. Assessment of Nutritional Status through Biochemical measurement
   a) To find out iron deficiency among adolescent's by using Sahli's Method.
3. Diet and nutrition surveys:
   (a) Diet survey for breast-feeding and weaning practices of specific groups.
   (b) Monitoring of Immunization schedule.
   (c) Use of anthropometric measurement in children.
4. Observe the working of nutrition and health- oriented programs (survey based result).
5. PreparationofVisual Aids

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome for ND3540

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use, for more than One*)
CO1	Student should be able to learn about anthropometric measurements and their measuring sites.	3	Emp
CO2	Student shouldbe able to learn to create questionnaire for nutritional assessment of community people.	2	S,Emp
CO3	Student should be able to learn about different types of supplementory foods and their cooking techniques.	3	Emp,Ent,S

CO-PO Mapping for ND3540

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	3	3	2	3	1	2	1	2	3	3	3	2	1
CO 2	2	1	3	2	2	3	2	2	2	3	2	2	3
CO 3	3	2	2	1	1	2	2	3	3	2	1	3	2
Avg	**2.6**	**2**	**2.3**	**2**	**1.3**	**2.3**	**1.6**	**2.3**	**2.6**	**2.6**	**2**	**2.3**	**2**

ND3502	Title: Food Packaging	L T P C 2 2 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Introduction to Food Packaging	9
Definition of food packaging • concepts• functions:- containment • protection • convenience • communication • marketing • portion control • security **package environment**:- physical environment, ambient, human environment • Function/ environment grid for evaluating packaging performance • packaging innovation **Food Packaging material:-** Introduction • definition • functions of packaging material • types of packaging material Food packages:- bags, pouches, wrappers, tetra packs		
Unit II	Packaging Material	10
Introduction• definition • purpose • requirement• types of material:- paper based, metal packaging, plastic packaging, glass packaging• types of containers **Materials and Forms Modern Packaging:**Glass containers**,** metal cans**,** composite containers**,** aerosol containers**,** rigid plastic packages**,** semi rigid packaging**,** flexible packaging		
Unit III	Packages of Radiation Stabilized Foods	10
Introduction • definition • types •methods for establishing radiation stabilization • rigid containers• flexible containers Radiation measurement of radiations.Biodegradable packaging material – biopolymer based edible firm		
Unit IV	Packages of Dehydrated Foods	10
Introduction • Definition of dehydrated products •Orientation •metallization •co-extrusion of multilayer films • stretch •package forms and techniques **Aseptic packaging:**Introduction • history •principles of sterilization • aseptic packaging system • restorable containers •modified and controlled atmosphere packaging •skin, stink and cling film packaging •micro oven able containers • other package forms •components of plastics • integrity testing of aseptic packaging		
Unit V	Packaging of Finished Goods	9
Introduction• Definition of finished goods • package selection criteria •Weighing• filling• scaling• wrapping• cartooning• labeling• marking and trapping. **Labelling**: Introduction • definition of labeling •Standards • purpose • description •types of labels •labelling regulation barcode •nutrition labelling •health claims •mandatory labelling provision		

Text Book	1. Shubhangini A. Joshi, "Nutrition and Dietetics"TataMc Grow- Hill publishing Company Ltd, NewDelhi. 2. Srilakshmi. B – "Nutrition Science", V Edn, New Age International (P) Ltd, Publishers, Chennai.
Reference Books	1. Passmone R and Eastwood M.A, "Human Nutrition and Dietetics", English languagebook Society/Churchill Livingstone,Eighth edition, HongKong. 2. Neiman N. Catherine, "Nutrition",Wm.C. Brown Publishers. USA.
Mode of Evaluation	Internal & External
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome for ND3502

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about the concept, functions of packaging and packaging materials. The types of packaging materials used for different food commodities.	3	Emp
CO2	Students should be able to learn about the different types of modern packaging materials such as based based on aerosol, flexibe, semi flexibe and rigid packaging materials.	2	S
CO3	Students should be able to learn about the packaging of radiation based foods, its importance and applications in food packaging industries.	3	Emp
CO4	Students should be able to acquire knowledge about aseptic packaging along with different packaging materials used during heat processing techniques such as sterilization, pasteurization etc.	2	Emp, S, Ent
CO5	Students should be able to learn about packaging of finished food along with the labeling regulations.	3	S

CO-PO Mapping for ND3502

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	3	1	1	2	2	1	3	2	3	2	1
CO 2	3	1	3	1	2	2	1	1	3	2	3	1	2
CO 3	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 4	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 5	2	2	3	2	1	2	2	1	2	2	3	2	1
Avg	**2.6**	**1.4**	**2.8**	**1.4**	**1.2**	**2.2**	**1.6**	**1.2**	**2.4**	**1.8**	**3**	**1.6**	**1.4**

ND3541	Title: Food Packaging Lab	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Experiment No.	List of Experiments	

1. Identification of different types of packaging & packaging materials.
2. Measurement of thickness of packaging material.
3. To perform non-destructive tests for glass containers.
4. Introducing the latest trends in packaging materials for different commodities.
5. Testing of chemical resistance of packaging material.
6. Determination of tensile strength of a given material.
7. To perform grease resistance test in plastic pouches.
8. Determination of tearing strength of a paper.

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome for ND3541

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ entrepreneurship (en)/ None (*Use , for more than One*)
CO1	Students should be able to learn about Identification of different types of packaging & packaging materials.	3	Emp
CO2	Students should be able to learn to perform non-destructive tests for glass containers etc.	2	S
CO3	Students should be able to learn about latest trends in packaging materials for different commodities	3	Emp

CO-PO Mapping for ND3541

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	3	2	0	2	1	2	3	1	3	2	1
CO 2	3	2	3	2	2	3	2	1	2	2	2	2	2
CO 3	2	1	1	3	1	0	2	3	1	2	1	3	2
Avg	**2.3**	**1.3**	**2.3**	**2.3**	**1**	**1.6**	**1.6**	**2**	**2**	**1.6**	**2**	**2.3**	**1.6**

ND3503	Title: Advance Dietetics I	L T P C 4 0 0 4
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Diet in Stress & burns	9
Introduction, phases of stress, dietary management. Burns:- Introduction, types, dietary management.		
Unit II	Diet in Cancer	10
Introduction• origin• causes• diagnosis• relation of nutrition & cancer• effect of cancer on nutritional status• objectives of nutrition therapy• nutritional management		
Unit III	Diet in Disturbances of Small Intestine	10
Diverticular Disease:- introduction • prevalence• causes• signs &symptom • dietary modification **Inflammatory Bowel Disease:-** introduction • Categories of IBS:- crohn's disease & ulcerative colitis • Prevalence of Crohn's disease and ulcerative colitis • signs &symptoms • dietary modification		
Unit IV	Diet in Malabsorption Diseases	10
Celiac Disease:- introduction • manifestation of disease• role of gluten • signs & symptoms • complications • dietary modification **Lactose Intolerance:-** introduction • manifestation of disease• role of lactase enzyme • signs & symptoms • complications • dietary modification **Steatorrhoea**:-introduction • manifestation of disease• role of lipase enzyme • signs & symptoms • complications • dietary modification		
Unit V	Inborn Errors of Metabolism	9
Phenylketonuria, Galactosaemia, Fructosuria, Wilson's disease, Menke,s disease, Fructose-1,6, Biphosphatase Deficiency		
Text Book	1. F P Antia, "Clinical Dietetics and Nutrition" 2. Kumud Khanna, "Textbook of Nutrition &amp" 3. Y.K.Joshi, "Basics of Clinical Nutrition" 4. B.Shri. Lakshmi, " Dietetics"	
Reference Books	1. Passmone R and Eastwood M.A, "Human Nutrition and Dietetics", English languagebook Society/Churchill Livingstone,Eighth edition, HongKong. 2. Neiman N. Catherine, "Nutrition",Wm.C. Brown Publishers. USA.	
Mode of Evaluation	Internal & External	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3503

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about different types of stress and its effect on human body. Students will learn the nutritional management in burn patients.	3	Emp, S, Ent
CO2	Students should be able to learn about different types of cancer, its metabolism, nutritional management and how we can prevent it .	2	Emp, S, Ent
CO3	Students should be able to learn about different about different types of small bowel diseases and how it can be prevented by dietary changes.	3	Emp,S
CO4	Students should be able to learn about different Malabsorption diseases and its nutritional management.	2	Emp, S
CO5	Students should be able to learn about different inborn error diseases and which food should be avoided in them.	3	S,Emp

CO-PO Mapping for ND3503

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	0	0	1	3	3	2	1	3	1	0	1
CO 2	2	2	3	3	3	3	2	2	2	3	1	3	3
CO 3	2	2	3	3	3	3	2	3	1	3	1	3	3
CO 4	2	3	3	3	1	2	2	2	2	2	1	2	2
CO 5	3	2	3	3	1	2	2	2	2	2	1	2	2
Avg	**2.2**	**2**	**2.4**	**2.4**	**1.8**	**2.6**	**2.2**	**2.2**	**1.6**	**2.6**	**1**	2	**2.2**

ND3542	Title: Advance Dietetics I Lab	L T P C 0 0 4 2
Version No.	1.0	
Course Prerequisites	NIL	
Experiment No.	List of Experiments	

Planning, Preparation and calculation of following Diets:-

- Burns
- Cancer
- Diverticular Disease
- Ulcerative Colitis
- Celiac Disease
- Lactose Intolerance
- Steatorrhoea
- Inborn errors of metabolism

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome for ND3542

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to plan therapeutic diets for various advance diseases like burns, cancer, Inborn errors diseases and advance gastro diseases.	3	Emp, S, Ent
CO2	Students should be able to learn the preparation of therapeutic diets for various advance diseases like burns, cancer, Inborn errors diseases and advance gastro diseases.	2	Emp, S, Ent
CO3	Students should be able to learn to calculate RDA,s according to individual patients for various diseases like burns, cancer, Inborn errors diseases and advance gastro diseases.	3	Emp, S, Ent

CO-PO Mapping for ND3542

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	2	3	2	0	2	3	2	3	1	3	2	1
CO 2	3	2	2	2	2	3	2	2	2	2	2	2	2
CO 3	3	1	3	3	1	2	2	1	1	2	1	3	2
Avg	**2.6**	**1.6**	**2.6**	**2.3**	**1**	**2.3**	**2.3**	**1.6**	**2**	**1.6**	**2**	**2.3**	**1.6**

ND 3504	Title: Fitness & Sports Nutrition	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.		No. of hours (per Unit)
Unit: I	Introduction of fitness & Sports	7
Physical Fitness and health status: meaning, concept, assessment criteria and management Healthy life style: Strategies, factors that promote life style changes, self-management skills. Body composition in exercise and sport. Physical Activity: need, principles of physical activity. energy input and output: Different energy systems for endurance and power activity, Fuels and nutrients to support physical activity.		
Unit II	Physiology ofExercise	8
Definition of exercise, types of exercise, benefits of exercise. Meaning of physiology and exercise physiology. Importance & functions of exercise physiology in the field of sports. Long term &short-term effects of exercise on muscular system, cardiovascular system, digestive system, nervous system & functioning of endocrine glands.		
Unit III	Sports Nutrition	7
Nutrition in Sports: Functions & Recommended intakes. Diet manipulation, Pre-game, during and post-game meals. Nutritional role & recommendations of: CHO, fat, protein & amino acids. Diets for athletes with high energy requirements, stress, fracture and injury. Nutritional Supplements.		
Unit IV	Fluid & ElectrolyteBalance	7
Water and electrolyte balance: Water requirements & fluid balance. Vitamins & minerals requirements. Losses and their replenishment during exercise and sports events, effect of dehydration, sports drinks.		
Unit V	Clinical Sports Nutrition	7
Special Nutrition considerations for female, older and disabled athletes. Athletes with nutrition related disorders. Nutrition of athletes in hot, cold and highaltitude environments.		
Text Books	1. Marie Dunford(2017) Nutrition for sports and exercise 2. Cheung.S(2010) Advanced environmental exercise physiology. Human Kinetics	
Reference Books	1. Ira Walinaky, (1998) Nutrition in Exercise and sport 2. Charles B. Corbin, Ruth Lindsey and grey walk (2000) Concepts of fitness and wellness 3. Robert A. Robergers and Scott O. Roberts (2000) exercise physiology.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3504

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about different types of concepts in terms of physical fitness.	3	Emp
CO2	Students should be able to learn about different fundamentals of sports nutrition and requirements of different nutrients.	2	S
CO3	Students should be able to learn about nutritional guideline for different categories of high performance sports.	3	Emp
CO4	Students should be able to learn about challenges faced in sports and nutrition and various strategies to overcome them.	2	S
CO5	Students should be able to learn about various dietary supplements and their use and abuse during sports training.	3	En, Emp

CO- PO Mapping for ND 3504

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	3	1	1	2	2	1	3	2	3	2	1
CO 2	3	1	3	1	2	2	1	1	3	2	3	1	2
CO 3	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 4	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 5	2	2	3	2	1	2	2	1	2	2	3	2	1
Avg	**2.6**	**1.4**	**2.8**	**1.4**	**1.2**	**2.2**	**1.6**	**1.2**	**2.4**	**1.8**	**3**	**1.6**	**1.4**

ND3517	Title: Food Processing and Technology	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.		No. of hours (per Unit)
Unit: I	Introduction	6
Introduction to Food Science, Different kinds of Food Industries, Components of Food industries. Scope of food processing and technology. Applications of food science and Food Technology. Technology involved in the processing of fruits & vegetables. Status of India for the production of different of different commodities.		
Unit II	Principles of Processing and Preservation	6
Food processing and preservation principles, method of preservation: pasteurization (definition, time- temperature combination and equipment's) sterilization (definition, time-temperature combination and equipment's), blanching (definition, time-temperature combination and equipment's, adequacy in blanching), canning (definition, time-temperature combination and equipment's), packaging (Introduction, Metal Containers, Glass Containers, Rigid Plastic Containers, Restorable Pouches).		
Unit III	Technology used in Unit Operation	8
Screening; types of screens: Revolving screen, Shaking screen, Rotary screen, Vibratory screen, Air screen cleaners, Definition and Introduction to Separation, Types of Separators- Disk, Pneumatic & aspirator, separation-basedfluidization technique, Magnetic and Cyclone Separator. Size reduction procedures- Crushing, Impact, Shearing. Size reduction machinery- hammer mill, ball mill.		
Unit IV	Food Drying & Dehydration	8
Food Drying/Dehydration: Definition, free and bound moisture, concept of water activity, factors affecting drying. moisture content (wet basis and dry basis), equilibrium moisture content, drying methods and equipment's: sun/solar drying, Cabinet drying, tunnel dryer, spray dryer, freeze dryer, fluidized bed dryer, Nutritional, physio-chemical changes during drying.		
Unit V	Membrane Technology	8
Membrane Processing: General principles and advantages, dead end and cross flow, Classification of membrane system: Reverse Osmosis, Nano Filtration, Ultra Filtration, Micro Filtration, Electrodialysis and Pervaporation; Membrane technology comparison chart, Membrane application in the food industries; Membrane performance, and Limitation of membrane processes.		
Reference Books	• P.J Fellow, Food processing Technology 4th Edison, Woodhead publishing, 2016. • R.P. Srivastava&Sanjeevkumar, Fruit & vegetable Preservation: Principles &Practices,CBS Publishers & Distributors, 2002. • Norman N.Potter & Joseph H.Hotchkiss, Food Science Vth Edison, CBS Publishers & distributors. 2007. • encyclopedia of Food Science and Technology, Academic Press,1993. • Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S. Basic Food Preparation – A Complete Manual. Orient Longman, 2005 • B. Sivasankar, Food processing & Preservation 1st Edison PHI Learning Pvt. Ltd., 2009. • Ayantina Sharma, Textbook of Food Science & Technology, CBS Publishers & Distributors Pvt Ltd, India,2006. • Subbalakshmi G, Udipi SA. Food Processing and Preservation. New Age International Publishers, Delhi 2007. • Ramaswamy H and Marcott M. Food Processing Principles and Applications. CRC Press, 2005.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3517

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn the applications and scope of Food Science and Technology along with the production status of India for different commodities.	3	Emp, S, Ent
CO2	Students should be able to learn about methods of preservation by heat and Temperature.	2	S,Emp
CO3	Students should be able to learn about various screening methods employed in food preservation industries along with size reduction processess.	3	Emp, S
CO4	Students should be able to be learn the applications of preservation by drying and non thermal methods. They will also learn the method of preservation by concentration and evaporation.	2	Emp, s
CO5	Students should be able to learn about various membrane technology to increase shelf life of product along with its advantages and limitations	3	S,Emp

CO-PO Mapping for ND3517

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	3	1	1	2	2	1	3	2	3	2	1
CO 2	3	1	3	1	2	2	1	1	3	2	3	1	2
CO 3	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 4	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 5	2	2	3	2	1	2	2	1	2	2	3	2	1
Avg	**2.6**	**1.4**	**2.8**	**1.4**	**1.2**	**2.2**	**1.6**	**1.2**	**2.4**	**1.8**	**3**	**1.6**	**1.4**

ND3519	Title: Holistic Wellness and Life Remedies	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Course Outcome	1. Students will be able to learn about importance of holistic health. 2. Students will be able to learn about herbs used in Indian Tradition. 3. Students will be able to learn about different types of functional foods. 4. Students will be able to learn about different types of prebiotics and probiotics. 5. Students will be able to learn about different phytochemicals and antioxidants.	
Unit No.		No. of hours (per Unit)
Unit: I	Holistic Health	6
Definition, importance, different therapies that are used as holistic health, important aspects /components of holistic health. Different Life remedies- importance of water and sun light in preventing diseases. Importance of Breakfast in maintaining holistic health.		
Unit II	Herbs in Indian Tradition	8
Define Herbs, history of herbs, herbs in Indian tradition as-culinary herbs, herbs in food preparation, medicinal herbs. Uses and the medicinal values of herbs, Uses of aloevera, peppermint, rosemary, fennel, lavender, thyme, garlic, sage, basil, mint, tulsi, parsley etc. Heart healthy and immunity booster herbs.		
Unit III	Functional Foods	8
Evolution and definition of functional foods, types of foods categorized as functional foods, Health benefits of functional foods and future promises in Indian diet. Functional foods that are good for heart, bones, brain, nervous system & endocrine system		
Unit IV	Prebiotics and Probiotics	6
Definition, types, health benefits in gastrointestinal health, cancer, and other diseases, recent advances, challenges. Prebiotic ingredients in foods.		
Unit V	Phytochemicals And Antioxidants	8
Defination , classification of phytochemicals: terpenoids, carotenoids, polyphenols, sulphur containing compounds. Formation of Free radicals, reactive oxygen species and oxidative stress, antioxidant definition, mechanism of action and classification. Role of antioxidants and phytochemicals in preventing cancer, CVD, ageing and inflammation.		
Reference Books	1. Text book of Human Nutrition- AnjanaAgarwal, Shobha A Udipi, Jaypee Brothers Medical Publishers(P) LTD 2. Text book of Human Nutrition-Mahtab S Bamj, N PrahladRao, Vinodini Reddy, Second Edition, Oxford and IBH Publishing Co. Pvt.Ltd	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31.05.22	
Date of approval by the Academic Council	20.10.22	

Course Outcome for ND3519

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn the applications and scope of Food Science and Technology along with the production status of India for different commodities.	3	Emp, S, Ent
CO2	Students should be able to learn about methods of preservation by heat and Temperature.	2	S,Emp
CO3	Students should be able to learn about various screening methods employed in food preservation industries along with size reduction processess.	3	Emp, S
CO4	Students should be able to be learn the applicationsof preservation by drying and non thermal methods. They will also learn the method of preservation by concentration and evaporation.	2	Emp, s
CO5	Students should be able to learn about various membrane technology to increase shelf life of product along with its advantages and limitations	3	S, Emp

CO-PO Mappin for ND3519

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	3	1	1	2	2	1	3	2	3	2	1
CO 2	3	1	3	1	2	2	1	1	3	2	3	1	2
CO 3	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 4	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 5	2	2	3	2	1	2	2	1	2	2	3	2	1
Avg	**2.6**	**1.4**	**2.8**	**1.4**	**1.2**	**2.2**	**1.6**	**1.2**	**2.4**	**1.8**	**3**	**1.6**	**1.4**

ND3520	Title: Human development during lifecycle	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Course Outcomes	1. Students should be able to understand the role of interdisciplinary science in the development and well-being of individuals and families 2. Student will learn about cognitive, physical, emotional and motor development in childhood period. 3. Student will learn about prenatal and postnatal development of infant. 4. Students will be learn about the objective of early childhood care and education (ECCE) 5. Students will learn about the growth and development of human body.	
Unit No.		No. of hours (per Unit)
Unit: I	Conception Through Early Childhood	8
Principles of growth & development. Roles of heredity and environment in human development.Prenata Development – Conception, course of prenatal development, Conditions affecting prenatal development.Infancy Characteristics, Developmental tasks and Problems.Early Childhood - Characteristics, Developmental tasks and Behaviour, problems, Education Parenting in Early Childhood		
Unit II	Middle Childhood Through Old Age	7
Middle Childhood - Characteristics, Developmental tasks and Behaviour problems, Adolescence - Characteristic Developmental tasks and Socioemotionalproblems.Adulthood - Characteristics, Developmental tasks an Problems, Old Age – Physical changes, Developmental tasks and Emotional Problems.		
Unit III	Care And Education In Infancy And Childhood	7
Childcare in infancy and preschool years- Feeding, weaning, supplementary feeding and toilet training. Child rearing Practices-Definition, classification and implications. Objectives of Early Childhood Care and Education (ECCE); Recent developments – National Policy on Education, Yashpal Committee, Report: Learning Without Burden, Role of Indian Association for Pre School Education.Types of ECCE Programmes – Balwadi, Anganwadi, ICDS, Crèche and nursery school.Approaches to Early Childhood Education (ECE) - Montessori, Kindergarten and Play way methods.		
Unit IV	The Child With Special Needs	7
Definitions – Disability, Challenge and Special Needs. Incidence and Prevalence of Disability in India. Persons with Disabilities Act (1999). The Child with Intellectual Challenge – Definition, Assessment, Classification, Causes and Rehabilitation. a) The Child with Auditory Challenge – Definition, Assessment, Classification, Causes and Rehabilitation. b) The Child with Visual Challenge – Definition, Assessmen Classification, Causes and Rehabilitation.The Child with Learning Disability – Definition, Classification, Causes and Solution.Developmental Challenge – The Child with Autism.		
Unit V	Growth Development	6
Biological basis of Development, Prenatal Development, Emotional and Social Development, Physical and Cognitive Development(Infancy and toddlerhood, Early childhood, Middle childhood, Adolescence, Early adulthood, Middle adulthood, Late adulthood) Death, dying and bereavement		
Reference Books	• Berk, L. E. (1996). Child development. New Delhi:Prentice Hall. • Hurlock, E.B. (2007). Developmental psychology: A life – span approach. • New Delhi : Tata McGraw – Hill. • Mussen, B. Conger,J.J., Kagan,J. and Huston, A. C. (1990). Child • development and personality. New York : Harper and Row.	
Mode of Evaluation	Internal and External Examinations	

Recommendation by Board of Studies on	31.05.22
Date of approval by the Academic Council	20.10.22

Course Outcome For: ND3520

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn the applications and scope of Food Science and Technology along with the production status of India for different commodities.	3	Emp, S, Ent
CO2	Students should be able to learn about methods of preservation by heat and Temperature.	2	S,Emp
CO3	Students should be able to learn about various screening methods employed in food preservation industries along with size reduction processess.	3	Emp, S
CO4	Students should be able to be learn the applications of preservation by drying and non thermal methods. They will also learn the method of preservation by concentration and evaporation.	2	Emp, s
CO5	Students should be able to learn about various membrane technology to increase shelf life of product along with its advantages and limitations	3	S, Emp

CO-PO Mapping for ND3520

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	3	1	1	2	2	1	3	2	3	2	1
CO 2	3	1	3	1	2	2	1	1	3	2	3	1	2
CO 3	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 4	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 5	2	2	3	2	1	2	2	1	2	2	3	2	1
Avg	**2.6**	**1.4**	**2.8**	**1.4**	**1.2**	**2.2**	**1.6**	**1.2**	**2.4**	**1.8**	**3**	**1.6**	**1.4**

ND3543	Title: Internship Evaluation	L T P C 0 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Course Outcomes	The students will learn the practical exposure of the work that is carried out in Hospitals	
Unit No.		No. of hours (per Unit)

To gain the practical exposure of the work that is carried out in hospital like

- Formation of RT Feed,
- Preparation of Therapeutic Diets,
- Counceling sessions in OPD patients and
- Counceling of critical patients etc.
- Case Studies (minimum 2)

The students would be required to record their observations in the hospital on daily basis and will prepare their internship report based on these observations.

ModeofEvaluation	Internal and External Examination
Recommendation byBoardofStudieson	31.05.22
Dateofapproval BytheAcademic Council	20.10.22

Course Outcome for ND3543

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn the applications and scope of Food Science and Technology along with the production status of India for different commodities.	3	Emp, S, Ent
CO2	Students should be able to learn about methods of preservation by heat and Temperature.	2	S,Emp
CO3	Students should be able to learn about various screening methods employed in food preservation industries along with size reduction processess.	3	Emp, S
CO4	Students should be able to be learn the applications of preservation by drying and non thermal methods. They will also learn the method of preservation by concentration and evaporation.	2	Emp, s
CO5	Students should be able to learn about various membrane technology to increase shelf life of product along with its advantages and limitations	3	S, Emp

CO - PO Mapping for ND3543

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	3	1	1	2	2	1	3	2	3	2	1
CO 2	3	1	3	1	2	2	1	1	3	2	3	1	2
CO 3	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 4	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 5	2	2	3	2	1	2	2	1	2	2	3	2	1
Avg	**2.6**	**1.4**	**2.8**	**1.4**	**1.2**	**2.2**	**1.6**	**1.2**	**2.4**	**1.8**	**3**	**1.6**	**1.4**

SEMESTER 6

ND3601	Title: Community Nutrition II	L T P C 2 2 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Nutrition Education	10
Nutrition Education: Introduction. Objective. Importance. Principle of conducting Nutrition Education. Opportunities for conducting Nutrition Education. Steps for planning Nutrition Education Programmes. Evaluation of Nutrition Education Programmes. Methods used in nutrition education. Exhibition. Formal distanceeducation. Computer in Nutrition Education. Nutrition research on the Internet. Stand-alone application. On- Line application		
Unit II	Nutritional and Infection relationship	10
Nutritional and infection relationship:-Introduction• Definition • relationship between nutrition &infection Immunization:-Introduction • classification • precaution •target group • importance • nutritional care Food borne infection and intoxication diseases:- Introduction • definition• classification • roleof microorganisms• foods involved • target group • intoxication diseases • signs &symptoms •prevention of disease •nutritional care Infestation of food borne diseases :-Definition• classification •prevalence • risk factor • causes • Outbreak •signs &symptoms • Prevention •control of infection, dietary modification		
Unit III	National Nutrition Programmes	10
Introduction to nutritional program •relationship of health and nutrition• role played by community dietician in various nutritional programs • role of dietician incommunity National Program related to nutrition:-Nutritional problems in India • Nutritional Programs in India Vitamin A Deficiency program :-introduction • target group • objectives •activities National Iodine deficiency disorders(IDD) program :- introduction • target group • objectives • factors contributing to the progress of IDD program School Lunch Programme(SLP):- introduction • target group •objectives • factors contributing to the progress of program • activities Mid-day Meal program :- introduction • target group • objectives • Monitoring mechanism Integrated child development scheme :-introduction • target group • objectives, ICDS team, services		
Unit IV	Role of National & International Agencies in Community Nutrition	10
CFTRI:- introduction • mission • vision • objectives • functions •policies NIN:- introduction • mission • vision • objectives • functions •policies FAO:- introduction • mission • vision •objectives • functions •policies NIPCCD:- introduction • mission • vision • objectives • functions •policies CARE:- introduction • mission • vision • objectives • functions •policies WHO:- introduction • mission • vision • objectives • functions •policies UNICEF:- introduction • mission • vision •objectives • functions •policies ICMR:- introduction • mission • vision • objectives • functions •policies ICAR:- introduction • mission • vision • objectives • functions •policies CSIR:- introduction • mission • vision •objectives • functions •policies		
Unit V	Community Nutrition Programme Planning	8
Introduction, definition of community nutrition, methods of identification of problems, nutritional assessment, analysis of causes, resources, constraints, selection of interventions, setting a strategy, implementations, evaluation of the programme.		
Text Book	1. S.D Manivannan," Community Health Nursing-I" CBC Publication. 2. Sharma S, Wadhwa A.," Nutrition in the Community- A textbook", Elite Publishing House Pvt. Ltd 3. Mudambi, SR and Rajagopal MV, "Fundamentals of Foods, Nutrition and Diet Therapy, 2012: New Age International Publishers. 4. Lakra P, Singh MD, "Textbook of Nutrition and Health; First Ed,2008, AcademicExcellance	

Reference Books	1. Wardlaw GM, Hampl JS, "Persepective in Nutrition; Seventh Ed 2007; McGraw Hill. 2. Gibney et al. Public Health Nutrition,2004; Blackwell Publishing. 3. Mayer,J "Human Nutrition, Charles, C.Thomas, Spring field 4. Park's Textbook of Preventive and Social Medicine by Park. 5. Agarwal, "Textbook of Human Nutrition" Udipi
Mode of Evaluation	Internal & External
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome for ND3601

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about role of nutrition in maintaining health and solving various nutritional problems prevailing in India	2	Emp
CO2	Students should be able to learn about the relationship between infection and nutrition also about how infection leads to malnutrition at community level	3	S
CO3	Students should be able to learn about various national nutrition program working for the betterment of society	3	S
CO4	Students should be able to learn about various national and international agencies with their mission and functions for the community	3	En
CO5	Students should be able to learn about how any nutrition program is planned, formulated, implemented and evaluated	2	None

CO-PO Mapping for ND3601

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	2	1	3	1	1	2	2	1	3	2	3	2	1
CO 2	3	1	3	1	2	2	1	1	3	2	3	1	2
CO 3	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 4	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 5	2	2	3	2	1	2	2	1	2	2	3	2	1
Avg	**2.6**	**1.4**	**2.8**	**1.4**	**1.2**	**2.2**	**1.6**	**1.2**	**2.4**	**1.8**	**3**	**1.6**	**1.4**

ND3640	Title: Community Nutrition II Lab	L T P C 0 0 2 1
Version No.	1.0	
Course Prerequisites	NIL	
Experiment No.	List of Experiment	
1. Assessment of Nutritional Status Through Clinical measurement a) Write a clinical signs and symptoms of P.E.M iron deficiency anemia and Vitamin A deficiency 2. Assessment of Nutritional Status through Dietary measurement a) Assessment of Nutritional Status through 24-hour recall. b) Assessment of Nutritional Status of homogenous group of adolescents through Inventory method. c) Assessment of Nutritional Status of adolescent's through FFQ method. 3. Identification of nutritional problems among vulnerable groups. 4. Planning low cost nutritive recipes. 5. Development, use and evaluation of methods and aids for nutrition and health education. 6. Development of tools to, assess nutrition knowledge, attitudes and practice 7. Visit to Anganwadi and ICDS/FRI center.		
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3640

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Student should be able to learn about low nutrition rich recipes for community health	2	Emp
CO2	Student should be able to gain knowledge about nutritional assessment of different age groups.	2	S
CO3	Student should be able to learn about use and evaluation of audio visual aids	2	S

CO-PO Mapping for ND3640

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	3	1	3	2	1	3	1	2	2	2	3	1	1
CO 2	3	2	2	1	1	2	2	1	2	1	3	2	2
CO 3	2 **2.6**	2 **1.6**	3 **2.6**	2 **1.6**	1 **1**	2 **2.3**	2 **1.6**	1 **1.3**	2 **2**	2 **1.6**	3 **3**	2 **1.6**	1 **1.3**

ND3602	Title: Product Development and Sensory Evaluation	L T PC 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Sensory Evaluation of Foods	8
Introduction • History •Definition of sensory evaluation •terms related to sensory evaluation • objectives of sensoryevaluation • human senses:- sight, smell,taste:- basic components of taste, sound,touch •Basic taste:- sweet, salty, sour, bitter,umami Requirement of sensory analysisSensory evaluation panel:- introduction •criteria for panel selection • panelist preparation:- descriptive panel, consumerpanel • other considerations. Threshold tests for basic tastes. Importance and application for productformulation,Subjective and objective sensoryevaluation,Different types of sensory tests:- Difference test, Overall difference test, Attribute difference teat, Analytical descriptive test, Affective test, Preference test. Instrumental tests for sensory attributes – color, texture and odor.		
Unit II	Product Development	7
Introduction • definition • characterizingnew product• customer and consumers •Designing new product :– introduction•new product development team •types•drawing forces •organizing for productdevelopment • phases of new product development. Need for product development, Stages of product development, Success in product development, Consumer research. Role of sensory evaluation in consumerproduct acceptance		
Unit III	Consumer Behaviour	7
Introduction• definition of consumer •understanding consumer behavior •consumption process:- pre-consumption,consumption and post-consumption • consumer decision making process:-habitual, limited, extensive. Factors influencing product acceptanceandpurchasingtrends:- internal influence, social influence :- ritual • situationalinfluence, Concept of consumerinvolvement		
Unit IV	Market Place Changes in processed food	7
Introduction • application of marketingstrategy:- segmentation, targeting,positioning. Segmentation:- geographic, demographic,psychographic, behavioral. Targeting:- introduction • developing targetmarket segment • evaluating Positioning		
Unit V	Special Food Processing Technologies and Novel Food Ingredients	7
Introduction to special processing technologies:-Membrane technology, reverse osmosis, ultra filtration, Agglomeration, Agitation, Air classification, Extrusion, Automation in food industries.Advantages and disadvantages ofdifferent technologies. Definition of novel foods, Benefits of novel foods		
Text Book	1. B. Srilakshmi, "Food Science" 2. Ernest R. Vieira, "Elementary Food Science" 3. SunetraRoday, "Food Science and Nutrition";Oxford University Press 4. Avantina Sharma, "Food Product Development" ;CBC Publishers &DistributersPvtLtd,India	
Reference Books	1. Sensory Evaluation of Food by HildegardeHeymann, Harry T. Lawless 2. Sensory Evaluation Techniques by Gail Vance Civille, B. Thomas Carr 3. Gordon W. Fuller, "New Food Product Development: From Concept to Marketplace", 3rd Edition ; CRC Press	
Mode of Evaluation	Internal & External	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3602

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to do sensory evaluation of foods and instruments test for sensory attributes like color, texture and odor.	2	Emp
CO2	Students should be able to learn about designing of new product development, phases of new product develop development and role of sensory evaluation in consumer product acceptance.	2	S
CO3	Students should be able to learn consumer behavior, factors influencing product acceptance and purchasing trends.	2	S
CO4	Students should be able to learn about market place changes in processed foods and application of market strategy.	2	En
CO5	Students should be able to learn about special food processing technologies and novel food ingredients. Advantages and disadvantages of different technologies.	1	None

CO-PO Mapping for ND3602

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	1	3	2	2	3	2	1	2	3	2	2	0	2
CO 2	2	2	2	3	3	2	2	2	3	2	2	1	2
CO 3	3	2	2	1	3	2	2	3	3	2	2	2	2
CO 4	2	1	2	1	3	2	1	3	3	2	1	2	2
CO 5	2	2	2	0	3	2	1	1	3	2	1	2	2
Avg	**2**	**2**	**2**	**3.5**	**3**	**2**	**1.4**	**2.2**	**3**	**2**	**1.6**	**1.4**	**2**

ND3641	Title: Product Development and Sensory Evaluation Lab	L T P C 0 0 3 2
Version No.	1.0	
Course Prerequisites	NIL	
Experiment No.	List of Experiments	

1. Sensory analysis: Different types of sensory tests for basic tastes and sensory attributes of products.
2. Project on different sensory techniques and responses utilizing prepared food products, analysis andpresentation of sensory data.
3. Stepwise development of a new food product, standardization, acceptability studies and submissionof project report.
4. Survey on types of convenience foods / consumer behavior / analysis of food labeling.

Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31-05-2022
Date of approval by the Academic Council	20-10-2022

Course Outcome for ND3641

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Student should be able to learn to analyzed different sensory quality attributes of the products.	2	Emp
CO2	Student should be able to learn to develop new product, its standardization, acceptability studies etc.	2	S
CO3	Student should be able to learn the market survey of different types of convenience foods and analysis of food labeling parameters	2	S

CO-PO Mapping for ND3641

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	3	2	1	3	3	1	3	2	1	3	3	3	2
CO 2	2	1	2	3	3	2	2	2	2	2	2	3	2
CO 3	1	2	2	2	3	2	0	2	1	2	2	3	1
Avg	**2**	**1.6**	**1.6**	**2.6**	**3**	**1.6**	**1.6**	**2**	**1.3**	**2.3**	**2.3**	**3**	**1.6**

ND3603	Title: Advance Dietetics II	L T P C 2 2 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Diet in Surgery& AIDS	9
Introduction• types ofsurgery:- general surgery, emergencysurgery, gastrointestinal surgery• factors affecting surgery• pre operativenutrition• post- operative nutrition• goalsof dietary management• dietarymanagement Introduction• stages of disease progression• relation ofnutrition in AIDS• impact of AIDS on nutritional status• nutritional Management of AIDS.		
Unit II	Disease of Gall Bladder & Pancreas	10
Introduction, function, classification, pathophysiology of gallbladder. **Cholecystitis**:- Etiology, causes, symptoms, dietary treatment:- nutritional requirement, dietary modification, foods avoided, foodsgiven. **Cholelithiasis**:- Etiology, causes, symptoms, dietary treatment:-nutritional requirement, dietarymodification, foods avoided, foodsgiven. **Diseases of the Pancreas**:-introduction, function, classification, pathophysiology of pancreas. **Pancreatitis**:- :- Etiology, types ,riskfactor , causes, symptoms, complications, dietary treatment/nutritional requirement, dietarymodification, foods avoided, foodsgiven		
Unit III	Diet in Gout & Nutrient Drug Interaction	10
Introduction •nature •occurrence of uricacid •causes •symptoms • diagnosis•nutritional management • dietarymodification • foods avoided• foods given .Nutrient Drug Interaction:-Introduction• definition • classificationof nutrient drug • effect of drug onnutritional status • stages of drugabsorption• things to be kept in mind innutrient drug interaction• nutrient druginteraction list.		
Unit IV	Diet in Liver Diseases	10
Introduction • function • classification • pathophysiology of liver. **Jaundice**:- Etiology• causes •symptoms •dietary treatment:- nutritional requirement • dietary modification • foods avoided• foods given. **Hepatitis**:- Etiology• causes•symptoms •dietary treatment:-nutritional requirement • dietary modification • foods avoided• foods given. **Cirrhosis**:- Etiology• causes •symptoms•dietary treatment:- nutritional requirement • dietary modification • foods avoided• foods given. **Hepatic Coma**:- Etiology• causes •symptoms •dietary treatment:- nutritional requirement • dietarymodification • foods avoided• foods given. Role of alcohol in liver diseases.		
Unit V	Diet in Addictive Behavior	9
Anorexia nervosa: – Introduction• types • difference between dieting and anorexia• symptoms • causes• risk factor • effect • treatment• nutritional management.**Bulimia nervosa**: – Introduction•symptoms• causes• risk factor• effect• treatment• nutritional management. **Alcoholism**: – Introduction•symptoms• causes• diagnosis•treatment• nutritional management		
Text Book	1. F P Antia, “Clinical Dietetics and Nutrition” 2. Kumud Khanna, “Textbook of Nutrition &amp” 3. Y.K.Joshi, “Basics of Clinical Nutrition” 4. B.Shri. Lakshmi, “ Dietetics”	
Reference Books	1. Passmone R and Eastwood M.A, “Human Nutrition and Dietetics”, English languagebook Society/Churchill Livingstone,Eighth edition, HongKong. 2. Neiman N. Catherine, “Nutrition”,Wm.C. Brown Publishers. USA.	
Mode of Evaluation	Internal & External	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3603

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about different types of surgery and HIV infection and its effect on human body along with its nutritional management.	2	Emp
CO2	Students should be able to learn about different functions of gall bladder and pancreas, nutritional management in these diseases and how we can prevent it	2	S
CO3	Students should be able to learn about different nature and metabolism of Uric acid and its disease. Students will also learn about drug nutrient interaction and its affects.	2	S
CO4	Students should be able to learn about different liver diseases and its nutritional management.	2	Ent
CO5	Students should be able to learn about different additive behavior diseases and how it can be controlled.	1	None

CO-PO Mapping for ND3603

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	1	0	0	1	3	3	2	1	3	1	0	1	1
CO 2	3	3	3	3	2	2	2	3	1	3	3	3	3
CO 3	3	3	3	3	2	3	1	3	1	3	3	3	3
CO 4	3	3	1	2	2	2	2	2	1	2	2	3	2
CO 5	3	3	1	2	2	2	2	2	1	2	2	3	2
Avg	**2.6**	**2.4**	**1.6**	**2.2**	**2.2**	**2.4**	**1.8**	**2.2**	**1.4**	**2.2**	**2**	**2.6**	**2.2**

ND3642	Title: Advance Dietetics II Lab	L T P C 0 0 4 2
Version No.	1.0	
Course Prerequisites	NIL	
Course Outcome	1. Student should be able to plan therapeutic diets for various advance diseases like Surgery, AIDS, Liver, Gall Bladder, Pancreas, Eating disorder etc 2. Student should be able to prepare therapeutic diets for various advance diseases like Surgery, AIDS, Liver, Gall Bladder, Pancreas, Eating disorder etc 3. Students should be able to learn to calculate RDA,s according to individual patients for various diseases like Surgery, AIDS, Liver, Gall Bladder, Pancreas, Eating disorder etc	
Experiment No.	List of Experiments	
Planning, Preparation and calculation of following Diets:- • Pre-operative surgery Care&Post operative Surgery Care • AIDS • Cholecystitis • Cholelithiasis • Pancreatitis • Gout • Hepatitis • Liver Cirrhosis • Addictive Behavior's		
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3642

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Student should be able to plan therapeutic diets for various advance diseases like Surgery, AIDS, Liver, Gall Bladder, Pancreas, Eating disorder etc	2	Emp
CO2	Student should be able to prepare therapeutic diets for various advance diseases like Surgery, AIDS, Liver, Gall Bladder, Pancreas, Eating disorder etc	2	S
CO3	Students should be able to learn to calculate RDA,s according to individual patients for variousdiseases like Surgery, AIDS, Liver, Gall Bladder, Pancreas, Eating disorder etc	2	S

CO-PO Mapping for ND3642

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO0**	**PSO1**	**PSO2**	**PSO3**
CO 1	3	3	2	3	1	3	1	2	3	3	3	3	2
CO 2	3	3	2	2	1	3	2	2	3	3	2	3	2
CO 3	3	3	2	2	1	3	2	2	3	3	2	3	2
Avg	**3**	**3**	**2**	**2.3**	**1**	**3**	**1.6**	**2**	**3**	**3**	**2.3**	**3**	**2**

ND3617	Title: Food Preservation & Bakery	L T P C 3 0 0 3
sion No.	1.0	
Course Prerequisites	NIL	
Unit No.		No. of hours (per Unit)
Unit: I	Introduction to Food Preservation	6
Purpose and Scope of Preservation Principles & Objectives of food preservation: Classification of food in relation to shelf life, Principles and importance of food preservation, Scope of preservation industry in India.		
Unit II	Principles & Methods of Preservation	6
Principles and Methods of Preservation- Asepsis**,** Use of low temperature,Use of high temperature**,** Removal of moisture**,** Removal of air**,**Use of chemical preservatives**,** Fermentation**,** Irradiation**,** Gas preservation**,** Newer methods		
Unit III	Bakery	8
Baking industry and its scope in the Indian economy. Present Trends and Prospects **Preparation of cakes** - types of cakes; ingredients used; methods of batter preparation; steps in cake making; balancing of cake formula; evaluation of the baked cake; operational faults in cake processing and the remedial measures. **Preparation of pastry** - types of pastries (short crust, puff/flaky and choux pastry); ingredients; processing and evaluation. Faults and remedies. **Preparation of biscuits and cookies** –types; ingredients; processing and evaluation.		
Unit IV	Preservation by heat & Low temperature	8
Preservation by heat: Blanching,Pasteurization, Sterilization and UHT processing, Canning, Extrusion cooking, Dielectric heating, Microwave heating, Baking, Roasting and Frying, Retort processing of ready to eat products. **Preservation by low temperature**: Refrigeration, CA, MA and dehydrofreezing. Food irradiation, Principles of using electromagnetic radiation in food processing, Ionizing radiation and non-ionizing radiation, Advantages and disadvantages.		
Unit V	Preservation by drying & non-thermal methods	8
Preservation by drying, concentration and evaporation : Various methods employed in production of dehydrated commercial products, Selection of methods based on characteristics of foods to be produced, Advantages and disadvantages of different methods, Sun-drying, tray or tunnel drying, Spray drying, Drum drying, Freeze drying ,Fluidized bed drying. **Preservation by non-thermal methods**: High pressure, Hurdle technology. Use and application of enzymes and microorganisms in processing and preservation of foods, Food fermentations, Pickling, Smoking.		
Reference Books	1. Dubey SC. Basic Baking-Science and Craft. Society of Indian Bakers, Delhi 2007. 2. Edward, W P, The Science of Bakery Products, RSC Publishing, 2007. 3. encyclopedia of Food Science and Technology, Academic Press,1993. 4. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S. Basic FoodPreparation – A Complete Manual. Orient Longman, 2005 5. Sultan S. Practical Baking. The AVI Publishing Company,Connecticut 1996. 6. Khanna K, Gupta S, Seth R, Mahana R, Rekhi T. The Art and Science of Cooking. Phoenix Publishing House Private Limited, Delhi 2004. 7. Matz A. Bakery Technology and engineering. CBS Publishers, Delhi 1998. 8. Subbalakshmi G, Udipi SA. Food Processing and Preservation. New Age International Publishers, Delhi 2007. 9. Ramaswamy H and Marcott M. Food Processing Principles and Applications. CRC Press, 2005.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3617

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Student should be able to learn the applications and scope of Food Science and Technology along with the production status of India for different commodities.	2	Emp
CO2	Student should be able to learn about principles and methods of food preservation, by the use of chemical preservatives.	2	S
CO3	Student should be able to learn about bakery industry and its scope in the Indian economy. Students will also learn about preparation of pastry, biscuit and cakes.	2	S
CO4	Student should be able to learn about methods of preservation by heat and Temperature.	2	Ent
CO5	Student should be able to learn the applications of preservation by drying,non thermal methods, concentration and evaporation.	1	None

CO-PO Mapping for ND3617

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	1	3	2	2	3	2	1	2	2	2	3	2	3
CO 2	2	2	2	3	3	2	2	2	2	0	2	2	2
CO 3	3	2	2	1	3	2	2	3	1	1	2	2	1
CO 4	2	1	2	1	3	2	1	3	2	2	3	2	2
CO 5	2	2	2	0	3	2	1	1	1	1	2	2	0
Avg	**2**	**2**	**2**	**1.4**	**3**	**2**	**1.4**	**2.2**	**1.6**	**1.2**	**2.4**	**2**	**1.6**

RD3617	Title: Biostatistics & Research Methodology	L T P C 4 0 0 4
Version No.	2.0	
Course Prerequisites	NIL	

Course Outcomes	1. Students will be able to learn about Biostatistics – introduction, Role of statistics in health science 2. Students will be able to learn about use of databases and other sources 3. Students will be able to Understand the research designs used in biostats 4. Students will be able to analyse qualitative and quantitative data types 5. Students will be able to understand the role of evidence based practice within health and welfare.	
Unit No.		**No. of hours (per Unit)**
Unit: I		10
Introduction: Statistics, Biostatistics, Frequency distribution **Measures of central tendency:** Mean, Median, Mode- Clinical examples **Measures of dispersion:** Dispersion, Range, standard deviation, statistical problems **Correlation:** Definition, Karl Pearson's coefficient of correlation, Multiple correlation with examples.		
Unit II		10
Regression: Curve fitting by the method of least squares, fitting the lines y= a + bx and x = a + by, Multiple regression, standard error of regression with Examples **Probability:**Definition of probability, Binomial distribution, Normal distribution, Poisson's distribution, properties - problems Sample, Population, large sample, small sample, Null hypothesis, alternative hypothesis, sampling, essence of sampling, types of sampling, Error-I type, Error-II type, Standard error of mean (SEM) .**Parametric test:** t-test(Sample, Pooled or Unpaired and Paired) , ANOVA, (One way and Two way), Least Significance difference		
Unit III		10
Non Parametric tests: Wilcoxon Rank Sum Test, Mann-Whitney U test, Kruskal-Wallis test, Friedman Test **Introduction to Research:** Need for research, Need for design of Experiments, Experiential Design Technique, plagiarism **Graphs:** Histogram, Pie Chart, Cubic Graph, response surface plot, Counter Plot graph **Designing the methodology:** Sample size determination and Power of a study, Report writing and presentation of data, Protocol, Cohorts studies, Observational studies, Experimental studies, Designing clinical trial, various phases.		
Unit IV		8
Blocking and confounding system for Two-level factorials **Regression modeling:** Hypothesis testing in Simple and Multiple regressionmodels**Introduction to Practical components of Industrial and Clinical Trials Problems:** Statistical Analysis Using Excel, SPSS, MINITAB®, DESIGN OF EXPERIMENTS, R Online Statistical Software's to Industrial and Clinical trial approach		
Unit V		10
Design and Analysis of experiments:Factorial Design: Definition, 22, 23design. Advantage of factorial design **Response Surface methodology:** Central composite design, Historical design, Optimization Techniques		
Text Books	1. Mahajan BK: Methods in Biostatistics for medical students and research workers, 6th edition Jaypee, 1997. 2. Kothari CR. Research Methodology (Methods & Techniques) Wiley Eastern Limited. NewDelhi. 3. Rao, PSS Sundar, and J. Richard. *Introduction to biostatistics and research methods*. PHI Learning Pvt. Ltd.,2012. 4.Pagano M, GauvreauK, Pagano M. Principles of biostatistics. Pacific Grove, CA: Duxbury; 2000Mar. 5. Norman, Geoffrey R., and David L. Streiner. *Biostatistics: the bare essentials*. PMPH- USA,2008.	
Reference Books	1.Neuman, W. Lawrence, and Karen Robson. *Basics of social research*. PearsonCanada. 2.Strauss, A., and J. Corbin. *Basics of qualitative research techniques*. Sagepublications. 3.Corbin, Juliet, Anselm Strauss, and Anselm L. Strauss. *Basics of qualitative research*. Sage,2014. 4.Mackey, Alison, and Susan M. Gass. *Second language research:*	

	Methodology and design. Routledge,2015.
Mode of Evaluation	Internal and External Examinations
Recommendation by Board of Studies on	31.05.22
Date of approval by the Academic Council	20.10.22

Unit-wise Course Outcome	Descriptions	BL Level	Employability(Emp)/Skill(S)/Enterpenureship(En)/None (use, for more than one)
CO1	Students should be able to understand Research process and the application of statistics in .nutrition.		S
CO2	Students should be able to learn, identifying research problem, framing objectives, setting hypothesis& research design, testing hypothesis, reviewing literature.		Emp,
CO3	Students should be able to understand and implement Historical research, content analysis, causal-comparative research		En,s
CO4	Students should be able to develop a good observational scale		S , En
CO5	Students should be able to apply various statistical measurements for research data management and analysis.		S,En

Course Outcomes	Program Outcomes(Course Articulation Matrix(Highly Mapped-3 moderate -2, Low- 1, Not related-0)												Program Specific Outcomes			
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	2	3	0	3	0	3	2	3	0	3	1	3	2	1	1
CO2	3	2	3	0	1	3	1	2	3	2	1	2	0	1	3	1
CO3	3	0	2	2	3	2	1	1	0	3	0	2	2	1	1	3
CO4	1	1	3	2	3	1	0	3	3	3	3	1	2	0	2	1
CO5	3	3	0	2	3	0	2	0	3	2	1	2	2	2	2	3
AVEG.	2.4	1.6	2.2	1.2	2.6	1.2	1.4	1.6	2.4	2	1.6	1.6	1.8	1.2	1.8	1.8

ND 3618	Title: Fundamentals of Statistics	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	Nil	
Unit No.	Unit Title	No. of hours (per Unit)
Unit I	Introduction and presentation	7
Collection, Classification, Tabulation, Graphic and Diagrammatic presentation of Data ,histogram and ogives,		
Unit II	Measures of central tendency	7
Measures of Central Tendency: Mean, Median, Mode, Geometric Mean.		
Unit III	Measures of Dispersion	8
Range Method, Quartile Deviation, Mean Deviation, Standard Deviation, Coefficient of Variation. Measures of Skewness: Karl Pearson's Coefficient of Skewness, Measure of Kurtosis.		
Unit IV	Correlation and regression	7
Correlation: Karl Pearson's Coefficient of Correlation, Spearman's rank Correlation Coefficient , Regression Analysis		
Unit V	Probability	7
Definition of probability, Additive and Multiplicative Laws of probability and simple problems based on them, Bay's Theorem. Probability Distribution: Binomial , Poisson and Normal		
Text Books	1. Gupta, S.P. Statistical Methods. S. Chand & Sons, NewDelhi.	
Reference Books	1. Gupta, S.P. Statistical Methods. S. Chand & Sons, NewDelhi. 2. R.Rangaswamy. A Text Book of AgriculturalStatistics.	
Mode of Evaluation	Internal and External Examination	
Recommendation by Board of Studies on	18-08-2021	
Date of approval by the Academic Council	14-11-2021	

Course Outcome for ND 3618

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students will be able to learn about introduction of statistics and its presentation.	2	Emp
CO2	Students will be able to learn about measures of central tendency.	2	S
CO3	Students will be able to learn about measures of dispersion	2	S
CO4	Students will be able to learn about correlation and regression	2	Ent
CO5	Students will be able to learn about probability.	1	S

CO-PO Mapping for ND 3618

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	3	0	0	1	1	2	2	2	1	2	0	3	1
CO 2	1	1	0	1	1	3	1	0	2	3	1	1	2
CO 3	2	3	2	1	0	2	1	2	1	3	3	1	2
CO 4	0	0	3	3	0	0	2	0	3	1	0	3	0
CO 5	1	1	1	1	3	1	2	2	1	1	1	3	1
Avg	1.43	10	1.20	1.41	11	1.62	1.62	1.22	1.61	22	10	2.23	1.21

ND3619	Title: Holistic Wellness and Life Remedies	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.		No. of hours (per Unit)
Unit: I	Holistic Health	6
Definition, importance, different therapies that are used as holistic health, important aspects /components of holistic health. Different Life remedies- importance of water and sun light in preventing diseases. Importance of Breakfast in maintaining holistic health.		
Unit II	Herbs in Indian Tradition	8
Define Herbs, history of herbs, herbs in Indian tradition as-culinary herbs, herbs in food preparation, medicinal herbs. Uses and the medicinal values of herbs, Uses of aloevera, peppermint, rosemary, fennel, lavender, thyme, garlic, sage, basil, mint, tulsi, parsley etc. Heart healthy and immunity booster herbs.		
Unit III	Functional Foods	8
Evolution and definition of functional foods, types of foods categorized as functional foods, Health benefits of functional foods and future promises in Indian diet. Functional foods that are good for heart, bones, brain, nervous system & endocrine system		
Unit IV	Prebiotics and Probiotics	6
Definition, types, health benefits in gastrointestinal health, cancer, and other diseases, recent advances, challenges. Prebiotic ingredients in foods.		
Unit V	Phytochemicals And Antioxidants	8
Defination, classification of phytochemicals: terpenoids, carotenoids, polyphenols, sulphur containing compounds. Formation of Free radicals, reactive oxygen species and oxidative stress, antioxidant definition, mechanism of action and classification. Role of antioxidants and phytochemicals in preventing cancer, CVD, ageing and inflammation.		
Reference Books	1. Text book of Human Nutrition- AnjanaAgarwal, Shobha A Udipi, Jaypee Brothers Medical Publishers(P) LTD 2. Text book of Human Nutrition-Mahtab S Bamj, N PrahladRao, Vinodini Reddy, Second Edition, Oxford and IBH Publishing Co. Pvt.Ltd	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	18-08-2021	
Date of approval by the Academic Council	14-11-2021	

Course Outcome for ND 3619

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students will be able to learn about importance of holistic health.	2	Emp
CO2	Students will be able to learn about herbs used in Indian Tradition.	2	S
CO3	Students will be able to learn about different types of functional foods.	2	S
CO4	Students will be able to learn about different types of prebiotics and probiotics.	2	Ent
CO5	Students will be able to learn about different phytochemicals and antioxidants.	2	S

CO-PO Mapping for ND 3619

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	1	3	1	1	2	2	1	3	2	3	2	1	1
CO 2	1	3	1	2	2	1	1	3	2	3	1	2	1
CO 3	1	3	2	1	3	1	2	2	2	3	1	1	0
CO 4	2	2	1	1	2	2	1	2	1	3	2	2	1
CO 5	2	3	2	1	2	2	1	2	2	3	2	1	1
Avg	1	3	1	1	2	2	1	3	2	3	2	1	1

ND3620	Title: Food Safety and Quality Control	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.		No. of hours (per Unit)
Unit: I	Introduction to Food Safety	7
Introduction to Food Safety : Definition, Types of hazards and their impact on health, biological, chemical, physical hazards, and their control measures, Factors affecting Food Safety, Hygienic Food Handling, Purchasing and Receiving Safe Food—Important points to be observed for receiving various foods. Sanitary procedures while preparing, cooking and holding food, Safety of left over foods, Food Storage-Guidelines for storage of foods at various temperatures, Storage of Specific Foods.		
Unit II	Food BornIllness	7
Food Borne Illness and Food Hazards-Food borne illnesses caused by Bacteria, Virus and Parasites. Natural toxicants in foods, , natural toxins-naturally occurring toxicants in plants, mycotoxins, metal contaminants, pesticide residues, presence of extraneous material, residue from processing and packaging material, Chemicals, Antibiotics, Hormones and Metal contamination.		
Unit III	Food Adulteration	8
Adulteration – Food adulteration - definition, types common adulterants and its detection, food grains, wheat flour, Bengal gram flour, dhal, sweet meat, milk and milk products, edible oils, ghee or butter, sugar, jaggery, honey, tea, coffee, soft drinks, spices and condiments. Food additives, Food colourants and sweetners, Emulsifiers, stabilizers, thickening and gelling agents.		
Unit IV	Food Safety Management	7
Food Safety Management : Basic concept, Prerequisites - GHPs, GMPs and SSOPs , HACCP, ISO series, TQM - concept and need for quality, components of TQM, Kaizen. Risk Analysis, Accreditation and Auditing (in brief) Safety concerns in food packaging: Principles in the development of safe and protective packaging , Product labeling, Nutritional labeling and safety assessment of food packaging materials.		
Unit V	Food Laws & Standards	7
Food laws and Standards: Indian Food Regulatory Regime, Global Scenario, Other laws and standards related to food, FPO, PFA, FSSAI, AGMARK, BIS. GRAS and permissible limits for chemical preservatives and legal aspects for γ-irradiations. Recent concerns in food safety: New and Emerging Pathogens. Genetically modified foods / Transgenics / Organic foods. Newer approaches to food safety.		
Reference Books	1. Lawley, R., Curtis L. and Davis,J.(2004) The Food Safety Hazard Guidebook , RSCpublishing. 2. De Vries. (1997) Food Safety and Toxicity, CRC, New York. 3. Marriott, Norman G. (1985). Principles of Food Sanitation, AVI, New York, 4. Forsythe, S J. (1987) Microbiology of Safe Food, Blackwell Science, Oxford, USA. 5. Roday .S. (1999) Food Hygiene and Sanitation, Tata McGraw-Hill company Limited, New Delhi. 6. Duffus, J.H. and Worth, H.G. J. (2006) Fundamental Toxicology The Royal Society ofChemistry. 7. Gerorge, A.B. (2004). Fenaroli's Handbook of Flavor Ingredients. CRC Press. 8. Madhavi, D.L., Deshpande, S.S and Salunkhe, D.K. (2006). Food Antioxidants, Technological,toxicological and Health Perspective. Marcel Dekker. 9. Pomeraz, Y. and MeLoari, C.E. (2006), Food Analysis, Theory and Practice, CBS publishersand Distributor, New Delhi.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND 3620

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (En)/ None (*Use , for more than One*)
CO1	Students will learn about the different types of food hazards and their impact on human health.	2	Emp
CO2	Students will learn about the food borne illnesses caused by bacteria, virus and parasites and naturally occurring toxicants in plant foods.	2	S
CO3	Students will learn about different types of adulteration in food products.	2	S
CO4	Students will learn about basic concept of food safety management and nutritional labeling and safety assessment of food packaging materials.	2	Ent
CO5	Students will learn about various food laws and standards and newer approaches to food safety.	2	Emp

CO-PO Mapping for ND 3620

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	1	3	2	2	3	2	1	2	2	2	3	2	3
CO 2	2	2	2	3	3	2	2	2	2	0	2	2	2
CO 3	3	2	2	1	3	2	2	3	1	1	2	2	1
CO 4	2	1	2	1	3	2	1	3	2	2	3	2	2
CO 5	2	2	2	0	3	2	1	1	1	1	2	2	0
Avg	**2**	**2**	**2**	**1.4**	**3**	**2**	**1.4**	**2.2**	**1.6**	**1.2**	**2.4**	**2**	**1.6**

ND 3621	**Title: Health Psychology**	**LTPC 3 00 3**
Version No.	**1.0**	
Course Prerequisites	Nil	
Course Outcome	1. Students will be able to learn about need of Health psychology and its various perspectives. 2. Students will be able to learn about stress management and different relaxation techniques. 3. Student will be able to learn about Psychological dimensions and management of chronic illness. 4. Students will be able to learn about creativeness in thinking and problem solving and also learn about decision making strategies. 5. Student will be able to learn about stages of memory, models & theory of information processing and important factors that affects forgetting.	
Unit No.	**Unit Title**	**No. of hours\ (per Unit)**

Unit I	**Introduction to Health Psychology**	7
Introduction to Health Psychology Concept and need of health psychology, perspectives – individual, cultural, lifespan, bio-psychosocial model. Health behaviors, health beliefs, Illness cognitions. Health promoting and compromising behaviours. Government's policies in health promotion. Planned behaviour and health.		
Unit II	**Stress and coping**	7
Stress and coping Nature, physiology and management of pain, pain management techniques. Stress: physiology and sources of stress, stress management. Coping interventions: mindfulness, relaxation, self-affirmation, effectiveness training. Sources and daily management of stress. Practicing relaxation and mindfulness		
UnitIII	**Chronic and terminal disorders**	8
Chronic and terminal disorders Management of chronic illness: quality of life, emotional responses, coping with chronic illness, Personal issues. Psychological dimensions of heart disease and diabetes. Psychological issues in terminal illness: adjustment with death/dying, management of terminally ill. Visiting a health setting and interview with a chronically ill CHD patient. Case study of a diabetic patient.		
UnitIV	**Higher order Processes**	7
Higher order Processes Thinking: meaning and types; concept and language. Problem solving: meaning; steps of problem solving; decision making. Creativity: Nature and components of creativity, creative problem solving. Decision making strategies. Developing creative skills		
UnitV	**Memory and forgetting**	7
Memory and forgetting Memory: Nature and types; Stages of memory: sensory, STM, LTM. Models of information processing: Atkinson-Shiffrin, working memory Forgetting: nature and factors; forgetting curve; interference theory. Information processing theory Game theory		
TextBooks	1. Curtis, A. (2002). Health Psychology. Routledge: London. 2. Ogden, J. (2012). Health Psychology – A Textbook. McGraw Hill: London	
ReferenceBooks	1. Baum, T. A. Revenson, J. E. Singer. (2001). Handbook of Health Psychology.Lawrence Erlbaum Associates. 2. L. Crossley. (2000). Rethinking Health Psychology. Open University Press. 3. Houdmont, S. Leka. (2010). Contemporary Occupational Health Psychology: Global Perspectives on Research and Practice.Wiley Blackwell. 4. Walker. (2001). Control and the Psychology of Health: Theory, Measurement, and Applications. Open University Press, 2001 5. Pitts, K. Phillips. (1998). The Psychology of Health: An Introduction.Routledge	
ModeofEvaluation	Internal and External Examination	
Recommendation byBoardofStudieson	31.05.22	
Dateofapproval bytheAcademic Council	20.10.22	

COURSE OUTCOME FOR ND3621

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (En)/ None (*Use , for more than One*)
CO1	Students will be able to learn about need of Health psychology and its various perspectives.	2	Emp
CO2	Students will be able to learn about stress management and different relaxation techniques.	2	S
CO3	Student will be able to learn about Psychological dimensions and management of chronic illness.	2	S
CO4	Students will be able to learn about creativeness in thinking and problem solving and also learn about decision making strategies.	2	Ent
CO5	Student will be able to learn about stages of memory, models & theory of information processing and important factors that affects forgetting.	2	Emp

CO PO MAPPING FOR ND3621

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PSO 1**	**PSO 2**	**PSO 3**
CO 1	1	3	2	2	3	2	1	2	2	2	3	2	3
CO 2	2	2	2	3	3	2	2	2	2	0	2	2	2
CO 3	3	2	2	1	3	2	2	3	1	1	2	2	1
CO 4	2	1	2	1	3	2	1	3	2	2	3	2	2
CO 5	2	2	2	0	3	2	1	1	1	1	2	2	0
Avg	**2**	**2**	**2**	**1.4**	**3**	**2**	**1.4**	**2.2**	**1.6**	**1.2**	**2.4**	**2**	**1.6**

ND3622	Title: Health care and Hospital Administration	L T P C 3 0 0 3
Version No.	1.0	
Course Prerequisites	NIL	
Unit No.		No. of hours (per Unit)
Unit: I	Hospitality Management	7
Aims and objectives of Hospitality Management (Commercial point). Role of Hospitality Management in a Hospital set-up Etiquette and manners. Role of Conversation		
Unit II	Concepts of Food & Nutrition	7
To understand about basic concepts of human nutrition. Food & Nutrition. Role of Antioxidants. Overview of Metabolism & Balance Diet for patients		
Unit III	Concept of modern Hospitality Management	7
Treat your patients and treat also like your guest. Changing mind set of patients necessitate Hospitality Management. Concepts of modern Hospitality Management in a Hospital set-up		
Unit IV	Housekeeping in Hospitals	8
Concept of House Keeping services in Hospital setup, Role of Housekeeping Department, Hygiene and special precautions in Hospital Kitchen. Diet for Patient – Selection of food, Food to be avoid / Added in diet, Need Of Complementary food. Role of dietitian in hospital diet service. Management of Hospital diet.		
Unit V	Healthcare & Medical Tourism	7
Steps to prevent food adulteration and Food Adulteration Act, Concept of Medical tourism. Significance of Medical tourism in the modern Healthcare setting. Scope of Medical Tourism. Catering to International Patients.		
Reference Books	• C. Wood., 2015 Roy, Hospitality Management a Brief Introduction.1st edition, Sage Publication. • J De Micco., Frederick, 2017, Medical Tourism and Wellness: Hospitality Bridging Health care (H2H), Apple Academic Press. • Seba., Jaime A, 2015, Hospitality and Health: Issues and Developments, Apple Academic Press • Shirke, Gajnam.,2011, Hospitality Management, Shroff Pub.	
Mode of Evaluation	Internal and External Examinations	
Recommendation by Board of Studies on	31-05-2022	
Date of approval by the Academic Council	20-10-2022	

Course Outcome for ND3622

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to learn about hospital management.	3	Emp
CO2	Students should be able to learn about the concepts of Food & Nutrition.	2	S
CO3	Students should be able to learn about the concepts of modern hospitality management.	3	Emp, S
CO4	Students should be able to learn about housekeeping methods in hospitals	2	Emp, S, Ent
CO5	Students should be able to learn about healthcare and medical tourism.	3	S, En

CO- PO Mapping for ND3622

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped- 3, Moderate- 2, Low-1, Not related-0)										Program Specific Outcomes		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	3	3	2	3	1	3	1	2	3	2	3	2
CO 2	2	2	3	2	3	1	2	3	2	3	2	2	2
CO 3	2	2	2	2	3	2	2	3	2	2	1	1	2
CO 4	1	1	1	2	3	1	2	3	2	1	3	3	3
CO 5	1	3	2	3	1	3	1	2	3	3	3	3	2
Avg	**1.4**	**2.2**	**2.2**	**2.2**	**2.6**	**1.6**	**2**	**2.4**	**2.2**	**2.4**	**2.2**	**2.4**	**2.2**

ND 3623	Title: Resource Management & Extension Education	LTPC 3 00 3
Version No.	1.0	
Course Prerequisites	Nil	
Course Outcome	1. Students should be able to understand the role of communication in education training and learning industry. 2. Student will learn about the resource management and resource conversation. 3. Student will learn about planning, supervision, controlling, organizing, evaluation. 4. Students will be learning about the extension education and developing program for different community. 5. Students will learn about the extension communication and education.	
Unit No.	Unit Title	No. of hours\ (per Unit)

Unit I	**Communication Concept**	7
Historical background, concept and nature • Functions of Communication • Types of Communication - communication transactions; Formal and informal communication; Verbal and Non-verbal Communication • Scope of Communication- Education, training and learning industry, Motivation and Management, Corporate Communication, Management of Organizations, Advertising and Public relations • Communication and mainstream media- newspaper, radio, television and Cinema, ICTs and web based communication •Communication for social change		
Unit II	**Understanding Human Communication**	7
Culture and communication- Signs, symbols and codes in communication • Postulates/Principles of Communication • Elements of Communication and their characteristics • Models of Communication • Barriers to Communication		
Unit III	**Introduction to Resource Management**	8
• Concept, universality and scope of management • Motivation Theory. Understanding meaning, classification and characteristics of resources, factors affecting utilization of resources. • Maximizing use of resources and resource conservation. • Availability and management of specific resources by an individual/ family - Money - Time - Energy - Space. Consumer: Definition, role, Rights and responsibilities, Consumer Behaviors, Consumer problem and education.		
UnitIV	**Functions of Management: An overview**	7
Decision Making • Planning • Supervising • Controlling • Organizing • Evaluation Approaches to management • Ethics in management		
UnitV	**Communication for Extension**	7
Concept, nature and philosophy of Extension • Principles of Extension • Methods and Media of community outreach; Audio-Visual aids- concept, classification, characteristics and scope. • Relationship between, Communication, Extension and Development. Development programs for urban rural and tribal population growth in India covering program for nutrition Health education.		
ReferenceBooks	• Barker, L. (1990). "Communication", New Jersey: Prentice Hall, Inc; 171. • Devito, J. (1998) Human Communication. New York: Harper & Row. • Patri and Patri (2002); Essentials of Communication. Greenspan Publications • Koontz.H. and O'Donnel C., 2005, Management – A systems and contingency analysis of managerial functions. New York: McGraw-Hill Book Company • Kreitner. 2009, Management Theory and Applications, Cengage Learning: India • Rao V.S. and Narayana P.S., Principles and Practices of Management, 2007, Konark Publishers Pvt. Ltd	
ModeofEvaluation	Internal and External Examination	
Recommendation byBoardofStudieson	31.05.22	
Dateofapproval bytheAcademic Council	20.10.22	

COURSE OUTCOME OF ND3623

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Ent)/ None (*Use , for more than One*)
CO1	Students should be able to understand the role of communication in education training and learning industry.	3	Emp
CO2	Student will learn about the resource management and resource conversation.	2	S
CO3	Student will learn about planning, supervision, controlling, organizing, evaluation.	3	Emp, S
CO4	Students will be learning about the extension education and developing program for different community.	2	Emp, S, Ent

CO5	Students will learn about the extension communication and education	3	S, En

CO PO MAPPING OF ND3623

Course Outcomes	Program Outcomes (Course Articulation Matrix (Highly Mapped-3 moderate -2, Low- 1, Not related-0)										Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	0	2	1	0	3	1	0	2	2	1	3	2
CO2	2	2	2	2	1	2	0	2	1	1	1	0	0
CO3	2	3	3	1	1	1	1	1	2	1	3	2	2
CO4	1	1	0	2	1	3	1	2	0	3	3	2	2
CO5	0	1	1	1	2	0	1	2	2	2	2	0	3
Avg	1.6	1.4	1.6	1.4	1	1.8	0.8	1.4	1.4	1.8	2	1.4	1.8