PROGRAMME PROJECT REPORT

Bachelor of Science in

HUMAN NUTRITION (3 Year)

According to New Education Policy-2020

HUMAN NUTRITION

SCHOOL OF HEALTH SCIENCES
U. P. Rajarshi Tandon Open University
Prayagraj
2022

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1. Bachelor's Degree Programme

The National Education Policy (NEP) 2020 envisions a new vision that enable an individual to study one or more specialized areas of interest at a deep level, and also develop capabilities across a range of disciplines including sciences, social sciences, arts, humanities, languages, as well as professional, technical, and vocational subjects. The NEP 2020 focuses on the formulation of expected learning outcomes for all higher education programmes. It states that "National Higher Education Qualifications Framework (NHEQF)" shall be aligning with the National Skills Qualifications Framework (NSQF) to ease the integration of vocational education into higher education. It also points out that higher educationqualifications leading to a degree/diploma/certificate shall be described by the NHEQF in terms of Outcome Based Education (OBE).

The design of B.Sc. under UGC Choice Based Credit System (CBCS)programme in line with NHEQF offers opportunities and avenues to learn core subjects but also to explore additional avenues of learning beyond the core subjects for holistic development of a learner.

Programme:	**Bachelor of Science [Human Nutrition]**
Year	**First Introduction year: 2019**
Revision of Programme in accordance with NEP-2020	
Initiation year of revision	**2022**
Completion year of revision	**2023**

The salient advantages of the choice-based credit system are as follows:

- CBCS allows learner to choose inter-disciplinary, intra-disciplinary courses, skill-oriented courses (even from other disciplines according to their learning needs, interests and aptitude) and have more flexibility.
- CBCS offers flexibility for learner to study at different times and at different institutions to complete one course (ease of mobility of learner). Credits earned at one institution can be easily transferred to other universities.
- Learner may undertake as many credits as they can cope with without repeating all the courses in a given semester if they fail in one/more courses.
- Shift in focus from the teacher-centric to learner-centric education.

The uniform grading system will also enable potential employers in assessing the performance of the learner. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on learner's performance in examinations, guidelines framed by the UGC are followed. Hence, adoption of NHEQF helps to overcome the gap between university degree and employability by introducing skills and competencies in the graduates.

2. B.Sc. Programme

The structure and duration of undergraduate programme of Bachelor in Human Nutrition in accordance with NEP 2020 includes multiple exit options within this period, with appropriate certifications:

- Level 5: a **certificate** after completing 1 year (2 semesters) of study in the chosen discipline or field, including vocational and professional areas;
- Level 6: a **diploma** after 2 years (4 semesters) of study;
- Level 7: a **Bachelor's** degree after a 3-year (6 semesters) programme.

2.1 Programme Mission & Objectives:

In continuation with the mission of the University to provide flexible learning opportunities to all, particularly to those who could not join regular colleges or universities owing to social, economic and

other constraints, the 3-year Undergraduate Programme in Science, B.Sc. Human Nutrition aims at providing holistic and valuebased knowledge and guidance to promote scientific temper in everyday life. The program offers a platform to the learners to fulfill the eligible criteria in various scientific jobs in government and private sector.

The Programme aims at the following objectives:

1. To provide a sound academic base from which an advanced career in Human Nutrition can be developed.
2. To provide basic understanding about Human Nutrition among learners.
3. To develop academically competent and professionally motivated personnel, equipped with objective, critical thinking, right moral and ethical values that compassionately foster scientific temper with a sense of social responsibility.
4. To enable learners to become globally competent.
5. To inculcate entrepreneurial skills among Human Nutrition Bachelor's.

2.2 Relevance of the Programme with Mission and Goals

The 3-year Undergraduate Programme in Science, B.Sc. in Human Nutrition is designed with the objective of equipping learners to cope with the health issues and challenges for well being.In congruence with goals of the University the Programme also focuses to provide healthy society to meet global demands. The Programme is designed with many important papers so that a successful learner can go for higher studies in any one of the specialization of his/ her choice. The Programme also aims at making the learners fit for taking up various relevant jobs in health sector of the society.

2.3 Nature of Prospective Target Group of Learners

The Program is targeted to all individuals looking to earn a graduation degree for employment, further higher education, promotion in career and professional development.

2.4 Appropriateness of Programme to be conducted in ODL mode to acquire specific skills & competence

Learning outcomes after Level 5		
Learning Outcomes	**Elements of the descriptor**	**Level 5 (Undergraduate Certificate)**
LO 1	Knowledge and understanding	• Knowledge of facts, concepts, principles, theories, and processes in multidisciplinary areas in science. • Understanding of the linkages between various disciplines.
LO 2	Skills required to perform and accomplish tasks	• acquire cognitive and scientific skills for selecting and using relevant methods, tools, and materials to assess the appropriateness of approaches to solving problems associated with the science.
LO 3	Application of knowledge and skills	• apply the acquired knowledge, and a range of cognitive and practical skills to select and use basic methods, tools, materials, and information to generate solution s to specific problems relating to the science.
LO 4	Generic learning outcomes	• listen carefully, read texts related to the science analytically and present information in a clear and concise manner. • express thoughts and ideas effectively in writing and orally and present the results/findings of the experiments carried out in a clear and concise manner to different groups. • meet own learning needs relating to the science. • pursue self-directed and self-managed learning to upgrade knowledge and skills required to pursue higher level of education and training. • gather and interpret relevant quantitative and qualitative data

		to identify problems, • Critically evaluate the essential theories, policies, and practices by following scientific approach to knowledge development and take actions to generate solutions to specific problems associated with the science. • make judgment and take decision, based on analysis of data and evidence, for formulating responses to issues/problems associated with the science.
LO 5	Constitutional, humanistic, ethical and moral values	• embrace constitutional, humanistic, ethical, and moral values and practice these values in real-life situations.
LO 6	Employment ready skills, and entrepreneurship skills and mindset	• perform effectively in a defined job relating to the science. • Ability to exercise responsibility for the completion of assigned tasks.

Learning outcomes after Level 6		
Learning Outcomes	**Elements of the descriptor**	**Level 6 (Undergraduate Diploma)**
LO 1	Knowledge and understanding	• theoretic al and technical knowledge in multidisciplinary contexts, • deeper knowledge and understanding of one of the learning areas and its underlying principles and theories, • Procedural knowledge required for performing skilled or paraprofessional tasks associated with the chosen fields of learning.
LO 2	Skills required to perform and accomplish tasks	• Cognitive and technical skills required for performing and accomplishing complex tasks relating to the chosen fields of learning. • Cognitive and technical skills required to analyse and synthesize ideas and information from a range of sources. • Act on information to generate solutions to specific problem s associated with the chosen fields of learning.
LO 3	Application of knowledge and skills	• apply the acquired specialized or theoretical knowledge, and a range of cognitive and practical skills to gather quantitative and qualitative data,
LO 4	Generic learning outcomes	• listen carefully, read texts analytically and present complex information in a clear and concise manner, • communicate in writing and orally the information, arguments, and results of the experiments and studies conducted accurately and effectively. • Critically evaluate the essential theories, policies, and practices by following scientific approach to knowledge development. • make judgment and take decision, based on the analysis and evaluation of information, for determining solutions to a variety of unpredictable problems.
LO 5	Constitutional, humanistic, ethical and moral values	• embrace constitutional, humanistic, ethical, and moral values, and practice these values in life,
LO 6	Employment ready skills, and entrepreneurship	• take up job/employment or professional practice requiring the exercise of full personal responsibility for the completion of tasks and for the outputs of own work.

	skills and mindset	• exercise self- management within the guidelines of study and work contexts. • supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.

Learning outcomes after Level 7		
Learning Outcomes	**Elements of the descriptor**	**Level 7 (Bachelor in Science)**
LO 1	Knowledge and understanding	• comprehensive, factual, theoretical, and specialized knowledge in multidisciplinary contexts with depth in the underlying principles and theories. • knowledge of the current and emerging issues and developments.
LO 2	Skills required to perform and accomplish tasks	• cognitive and technical skills required for performing and accomplishing complex tasks to evaluate and analyse complex ideas. • Cognitive and technical skills required to generate solutions to specific problems.
LO 3	Application of knowledge and skills	• apply the acquired specialized technical or theoretic acknowledge, and cognitive and practical skills to gather and analyze quantitative/ qualitative data to assess the appropriateness of different approaches to solving problems,
LO 4	Generic learning outcomes	• listen carefully, to read text related to the chosen fields of learning analytically and present complex information in a clear and concise manner to different groups/audiences. • communicate in writing and orally the constructs and methodologies adopted for the studies undertaken relating to the chosen fields of learning, • Critically evaluate evidence for taking actions to generate solutions to specific problems based on empirical evidence. • make judgment and take decisions based on the analysis and evaluation of information for formulating responses to problems, including real-life problems,
LO 5	Constitutional, humanistic, ethical and moral values	• embrace the constitutional, humanistic, ethical, and moral values, and practice these values in life. • identify ethical issues in science, • formulate coherent arguments about ethical and moral issues, including environmental and sustainable development issues. • follow ethical practices in all aspects of research and development
LO 6	Employment ready skills, and entrepreneurship skills and mindset	• knowledge and essential skills set and competence that are necessary to: take up a professional job and professional practice, • entrepreneurship skills and mindset required for setting up and running an economic enterprise or pursuing self-employment • exercise management and supervision in the contexts of work or study activities involving unpredictable work processes and working environment

2.5 Instructional Design

2.5.1 3-year B.Sc. in Human Nutrition Programme Structure

The University follows the credit system in its all programmes. One credit is equal to 30 hours of learner's study time which is equivalent to 15 lectures in conventional system. To earn a Bachelor's Degree, a learner has to earn 120 credits in minimum six semesters (three years) with 20 credits per semester. For earning 120 credits, a learner has to opt from the following categories of courses:

(a) Discipline Specific Core Courses
(b) Discipline Specific Electives Courses (DEC)
(c) Ability Enhancement Compulsory Courses (AECC)
(d) Skill Enhancement Courses (SEC)

ProgrammeStructure of B.Sc. Programme under NHEQF

Level	Year	Sem	First Selected Subject	Second Selected Subject	Third Selected Subject	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Discipline Specific Elective Course (DEC)	Literature Survey/ Research Project	Total credit
			Discipline SpecificCore papers with credit	Discipline SpecificCore papers with credit	Discipline SpecificCore papers with credit					
5	1	1st	4	4	4	4	4	-	-	**20**
		2nd	4	4	4	4	4	-	-	**20**
6	2	3rd	4	4	4	4	4	-	-	**20**
		4th	4	4	4	4	4	-	-	**20**
7	3	5th	-	-	-	-	4	12	4	**20**
		6th	-	-	-	-	4	12	4	**20**
Total credit			16	16	16	16	24	24	**8**	**120**

Explanation of terms used for categorization of courses:

A. **Discipline Specific Core Courses:** A course, which should compulsorily be studied by a learner as a core requirement is termed as a Core course.

B. **Elective Course (DE):** Generally, a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course. The Elective course may be offered in following types:

   a) **Discipline Specific Elective Course (DCE):** Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective.

   b) **Industrial Training/ Survey/ Research Project/ Field Work/Apprenticeship/ Dissertation/Internship:** An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a learner studies such a course on his own with an advisory support by a counselor /faculty member. Currently, Literature survey and Research Project in 5thamd 6th semester respectively is offered under code; **LS101N** and **RP102N**.

   c) **Generic Elective (GE) Course:** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is called a Generic Elective. In B.Sc. programme presently we are not offering any such course.

   P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.

C. **Ability Enhancement Compulsory Courses (AECC):** AECC may be of two kinds: Ability Enhancement Courses (AEC) and Skill Enhancement Courses (SEC). "AECC" courses are the courses based upon the content that leads to knowledge enhancement. SEC courses are value-based and/or skillbased and are aimed at providing hands-on-training, competencies and skills.

(a) Ability Enhancement Courses (AEC): English Communication/Hindi Communication, Human Rights and Duties/Health & Hygiene, Environmental Science/Solid Waste Management, Disaster Management/Nutrition for Community.

Semester	Ability Enhancement Courses (AECC)
1	Ability Enhancement Course in English [AECEG] OR Ability Enhancement Course in Hindi [AECHD]
2	Ability Enhancement Course in Human Rights and Duties [AECHRD] OR Ability Enhancement Course in Health & Hygiene [AECHH]
3	Ability Enhancement Course in Environment Awareness [AECEA] OR Ability Enhancement Course in Solid Waste Management [AESWM]
4	Ability Enhancement Course in Nutrition for Community [AECNC] OR Ability Enhancement Course in Disaster Management [AECDM]

(b) Skill Enhancement Courses (SEC): These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge. In B.Sc. programme. Presently we are not offering options to choose from pool; however courses are fixed for respective semesters.

The format of **Skill Enhancement Courses** is given below:

2.5.2 Course curriculum: The details of syllabus is given in Appendix-I

2.5.3 Language of Instruction:SLM will be provided in English/Hindi. However, learner can write assignment and give Term End Examination (TEE) either in Hindi or English.

2.5.4 Duration of the Programme

Minimum duration in years: 03 Maximum duration in years: 06

2.5.5 Faculty & Support Staff requirement

Professor (2), Associate Professor (1), Assistant Professor (3) and support staff (1)

2.6 Instructional Delivery Mechanisms

The Open University system is more learner-oriented, and the student is an active participant in the teaching-learning process. Most of the instructions are imparted through distance rather than face-to-face communication.

The University follows a multi-media approach for instruction. It comprises of:

- self-instructional printed material (Self Learning Material)
- audio and video lectures
- face-to-face counseling
- assignments
- laboratory work
- Project work in some courses
- teleconference/web conference
- Web Enabled Academic Support Portal

2.6.1 Self-Learning Material

The Self Learning Material (SLMs)are prepared in line with the UGC guidelines on preparation of SLMs. The prepared study materials are self-instructional in nature.

The course material is divided into blocks. Each block contains a few units. Lessons, which are called Units, are structured to facilitate self-study. The units of a block have similar nature of contents. The first page of each block indicates the numbers and titles of the units comprising the block. In the first block of each course, we start with course introduction. This is followed by a brief introduction to the block. After the block introduction, emphasis is given on contribution of ancient Indian knowledge into that specific course. Next, each unit begins with an introduction about the contents of the unit. The list of objectives are outlined to expect the learning based outcome after working through the unit. This is followed by the main body of the unit, which is divided into various sections and sub-sections. Each unit is summarized with the main highlights of the contents.

Each unit have several "Check Your Progress" Questions and Terminal Questions /exercises. These questions help the learner to assess his/her understanding of the subject contents. At the end of units,additional references/books/suggested online web link for MOOCs/Open Educational Resources for additional reading are suggested.

2.6.2 Audio and Video lectures

Apart from SLM, audio and video lectures have been prepared for some courses. The audio-video material is supplementary to print material. The video lectures are available at YouTube channel of university

2.6.3 Counseling Classes

The face to face (F2F) counseling classes are conducted at head quarter and study centers. The purpose of such a contact class is to answer some of questions and clarify the doubts of learner which may not be possible through any other means of communication. Well experienced counselors at study centers provide counseling and guidance to the learner in the courses that (s)he has chosen for study. The counseling sessions for each of the courses will be held at suitable intervals throughout the whole academic session. The time table for counseling classesare displayed at head quarter as well as by the coordinator of study center, however, attending counseling sessions is not compulsory. It is noted that to attend the counseling sessions, learner has to go through the course materials and note down the points to be discussed as it is not a regular class or lectures.

2.6.4 Assignments

The purpose of assignments is to test the comprehension of the learning material that learner receives and also help to get through the courses by providing self-feedback to the learner. The course content given in the SLM will be sufficient for answering the assignments.

Assignments constitute the continuous evaluation component of a course. The assignments are available at the SLM section of the home page of university website. In any case, learner has to submit assignment before appearing in the examination for any course. The assignments of a course carry 30% weightage while 70% weightage is given to the term-end examination (TEE). The marks obtained by learner in the assignments will be counted in the final result. Therefore, It is advised to take assignments seriously. However, there will be no written assignments for Lab courses.

2.6.5 Laboratory Work

Laboratory courses are an integral component of the B.Sc. Human Nutrition programme. While designing the curricula for laboratory courses, particular care has been taken to weed out experiments not significant to the present-day state of the discipline. Importance has been given to the utility of an experiment with respect to real life experience, development of experimental skills, and industrial applications. It is planned to phase the laboratory courses during suitable periods (such as summer or autumn vacations) so that in-service persons can take them without difficulty. Laboratory courses worth 2 credits

will require full-time presence of the student at the Study Centre for one week continuously. During this time a student has to work for around 60 hours. Around 40 hours would be spent on experimental work and the remaining time will be used for doing calculations, preparations of records, viewing or listening to the video/audio programmes.

2.6.6 Teleconference/Web conference

Teleconference/web conference, using done through ZOOM/webex in form of online special counseling sessions is another medium to impart instruction to and facilitate learning for a distance learner. The students concerned would be informed about the teleconferencing schedule and the place where it is to be conducted by sending bulk SMS.

2.6.7 Web Enabled Academic Support Portal

The University also provides Web Enabled Academic Support Portal to access the course materials, assignments, and other learning resources.

2.6.8 Learner Support Service Systems

(a) Study Centre

A Study Centre has following major functions:

(i) **Counseling:**Counseling is an important aspect of Open University System. Face to face contact-cum-counseling classes for the courses will be provided at the Study Centre. The detailed programme of the contact-cum-counseling sessions will be sent to the learner by the Coordinator of the Study Centre. In these sessions learner will get an opportunity to discuss with the Counselors his/her problems pertaining to the courses of study.

(ii) **Evaluation of Assignments:** The evaluation of Tutor Marked Assignments (TMA) will be done by the Counselors at the Study Centre. The evaluated assignments will be returned to the learner by the Coordinator of Study Centre with tutor comments and marks obtained in TMAs. These comments will help the learner in his/her studies.

(iii) **Library:** Every Study Centre will have a library having relevant course materials, reference books suggested for supplementary reading prepared for the course(s).

(iv) **Information and Advice:**The learner will be given relevant information about the courses offered by the University. Facilities are also provided to give him/her guidance in choosing courses.

(v) **Interaction with fellow-students:** In the Study Centre learner will have an opportunity to interact with fellow students. This may lead to the formation of self-help groups.

(b) Learner Support Services (LSS)

The University has formed an LSS cell at the head quarter. The LSS cell coordinate with the Study Centre to get rid ofany problem faced by the learner.

2.7 Procedure for admissions, curriculum transaction and evaluation

2.7.1 Admission Procedure

(a) The detailed information regarding admission will be given on the UPRTOU website and on the admission portal. Learners seeking admission shall apply online.

(b) Direct admission to 3-year B.Sc. program is offered to the interested candidates.

(c) **Eligibility:** The candidate should pass the 10+2 level with Biology/science group./ Candidate should pass 10+2 with Home Science with Science Background.

2.7.2 **ProgrammeFee:**Rs. 9000 / year. The fee is deposited through online admission portal only.

2.7.3 Evaluation

The evaluation consists of two components: (1) continuous evaluation through assignments, and (2) term-end examination. Learner must pass both in continuous evaluation as well as in the term-end examination of a course to earn the credits assigned to that course.Foreach course there shall be one written Terminal

Examination. The evaluation of every course shall be in two parts that is 30% internal weightage through assignments and 70% external weightage through terminal exams.

(a) Theory course	**Max. Marks**
Terminal Examination	70
Assignment	30
Total	**100**

(b) Practical course:	**Max. Marks**
Terminal Practical Examination	100

Marks of Terminal Practical Examinationshall be awarded as per following scheme:

i.	Write up /theory work	30
ii.	Viva-voce	30
iii.	Execution/Performance/Demonstration	20
iv.	Lab Record	20

The following 10-Point Grading System for evaluating learners' achievement is used for CBCS programmes:

10-Point Grading System in the light of UGC-CBCS Guidelines

Letter Grade	Grade Point	% Range
O (Outstanding)	10	91-100
A+ (Excellent)	9	81-90
A (Very Good)	8	71-80
B+ (Good)	7	61-70
B (Above Average)	6	51-60
C (Average)	5	41-50
P (Pass)	4	36-40
NC (Not Completed)	0	0-35
Ab (Absent)	0	
Q	Qualified	Applicable only for Non-Credit courses
NQ	Not Qualified	

Learner is required to score at least a 'P' grade (36% marks) in both the continuous evaluation (assignments) as well as the term-end examination. In the overall computation also, learner must get at least a 'P' grade in each course to be eligible for the B. Sc. degree.

Computation of CGPA and SGPA

(a) Following formula shall be used for calculation of CGPA and SGPA

For jth semester SGPA (Sj) = Σ (Ci *Gi)/ Σ Ci	where, Ci = number of credits of the ith course in jth semester Gi= grade point scored by the learner in the ith course in jth semester.
CGPA = Σ (Cj *Sj)/ Σ Cj	where, Sj = SGPA of the jth semester Cj = total number of credits in the jth semester

The CGPA and CGPA shall be rounded off up to the two decimal points. (For e.g., if a learner obtained 7.2345, then it will be written as 7.23 or if s(he) obtained 7.23675 then it be will written as 7.24)
CGPA will be converted into percentage according to the following formula:

Equivalent Percentage = CGPA * 9.5

(b) Award of Division
The learner will be awarded division according to the following table:

Division	Classification
1st Division	6.31 or more and less than 10 CGPA
2nd Division	4.73 or more and less than 6.31 CGPA
3rd Division	3.78 or more and less than 4.73 CGPA

2.7.4 Multiple Entry and Multiple Exit options

The 3-year B.Sc Human Nutrition. programme is an Outcome-Based Education (OBE) for qualifications of different types. The qualification types and examples of title/nomenclature for qualifications within each type are indicated in Table 1.

Table 1

Level	Qualification title	Programme duration	Entry Option	Exit option
5	Undergraduate Certificate in Human Nutrition	Programme duration: First year (first two semesters) of the B.Sc. Human Nutrition programme	10+2 level with science group	**Exit** followed by an exit 10- credit bridge course(s) lasting two months, including at least 6- credit job-specific internship/apprenticeship
6	Undergraduate Diploma in Human Nutrition	Programme duration: First two years (first four semesters) of the of the B.Sc. Human Nutrition programme	Undergraduate Certificate obtained after completing the first year (two semesters) of the B.Sc. Human Nutrition programme	**Exit** followed by an exit 10- credit bridge course(s) lasting two months, including at least 6- credit job-specific internship/apprenticeship
7	Bachelor in Human Nutrition	Programme duration: First three years (first six semesters) of the of the B.Sc. Human Nutrition programme	Undergraduate diploma obtained after completing two years (four semesters) of the B.Sc. Human Nutrition programme	**Exit** followed by an exit 10- credit bridge course(s) lasting two months, including at least 6- credit job-specific internship/apprenticeship

Exit requirements from Level 5 to Level 7

Level	Year	Credits	Required Bridge Course of 10 credit to exit from each Level			Award of Certificate/ Diploma/Degree
Level 5	1	40	**courses**	**Credits**	**Duration**	Undergraduate Certificate in Human NutritionScience
			job-specific skill course	4	02 – 03 months	
			job-specific internship/apprenticeship	6		
				Total: 10		
Level 6	2	40	**courses**	**Credits**	**Duration**	Undergraduate Diploma in Human Nutrition
			job-specific skill course	4	02 – 03 months	
			job-specific internship/apprenticeship	6		
				Total: 10		
Level 7	3	40	**courses**	**Credits**	**Duration**	Bachelor in Human

			job-specific skill course	4	02 – 03 months	Nutrition
			job-specific internship/apprenticeship	6		
				Total: 10		

Norms for 10- credit bridge course(s):

1. The job-specific skill course is of 4 credits. Only assignment has to be submitted by learner with 100% evaluation weightage.
2. The job-specific internship/apprenticeshipof 02-03 months or more of 6 credits, after 2nd or 4th semester, will be mandatory for the learners desirous of exiting with a certificate or Diploma, respectively. The continuing learners may, however, undergo optional research internships after 2nd / 4th semester, to enhance their research capabilities, by engagement as interns in HEI/Research Institute/Industrial R&D labs/any other organization.
3. Under exit option from Level 5 to 7, the learner can choose HEI/Research Institute/Industrial R&D labs/any organization (Private/State Govt/Central Govt.) for internship/apprenticeship for job-specific bridge course by own or choose job-specific bridge coursefrom the list provided by the University. After successful completion, he/she submit the certificate obtained from organization to the Training & Placement (T & P) Office of the University to get Undergraduate certificate/diploma for successful completion. The monitoring of such learners shall be done by T & P Cell.

4. **Evaluation of Bridge Course of 10 credit to exit from each Level**

Bridge Course components	**Credit**	**Mode of Evaluation**
(a) job-specific skill course	4	Assignment
(b) job-specific internship/apprenticeship	6	Test/Viva voce/Practical conducted at organization level
Total credits	**10**	

5. Following is the list of courses under 10 credit bridge courses.

Level	**Bridge course/ 10 credit**			**Concerned Person to contact**
	Course Code / 4 credit	**Job specific Course Title**	**Internship Domain Area/ 6 credit**	
5	BCOT-01	Office Tools	DTP Publishing	In-charge, Training & Placement Cell
6	BCCPLT-02	CPLT	Laboratory Technique	
7				

2.8 Requirement of the laboratory support and Library Resources

The practical sessions are held in the science laboratories of the Study Centre. In these labs, the learner will have the facility to use the equipment andconsumablesrelevant to the syllabus. The SLM, supplementary text audio and video material of the various courses of the program is available through the online study portal of the University. The University also have a subscription of National Digital Library to provide the learners with the ability to enhance access to information and knowledge of various courses of the programme.

2.9 Cost estimate of the programme and the provisions

3-year B.Sc. programme consists of 22 courses and 4 laboratory courses. One course is of 2 credits which consist of approx. 10 units. The total approximated expenditure on the development of 111 courses is:

S. No.	Item	Cost per Unit (writing & editing)	Total cost (Rs.)
1	Total no. of units 220 in 22 courses	4500	9,90,000
2	BOS Meetings, etc.	10000	10000
		Total	**525000**

2.10 Quality assurance mechanism and expected programme outcomes

(a) **Quality assurance mechanism:** The program structure is developed under the guidance of the Board of studies comprising external expert members of the concerned subjects followed by the School board. The program structure and syllabus is approved by the Academic Council of the University. The course structure and syllabus is reviewed time to time according to the feedback received from the stakeholders and societal needs.
The Centre for Internal Quality Assurance will monitor, improve and enhance effectiveness of the program through the following:

- ✓ Annual academic audit
- ✓ Feedback analysis for quality improvement
- ✓ Regular faculty development programs
- ✓ Standardization of learning resources
- ✓ Periodic revision of program depending upon the changing trends by communicating to the concerned school

(b) **Expected programme outcomes (POs)**

Knowledge and understanding	**PO1**	Demonstrate a fundamental/coherent understanding of the academic field of science, its different learning areas and applications, and its linkages with related disciplinary areas/subjects
Skills related to specialization	**PO 2**	Demonstrate skills involving the constructive use of knowledge in the subfields of physical and life science, and other related fields of science in a range of settings, including for pursuing higher studies related to the science.
Application of knowledge and skills	**PO 3**	Identify and apply appropriate principles and methodologies to solve different types of problems with well-defined solutions.
	PO 4	Apply knowledge of typical and atypical development across the lifespan of an individual
Generic learning outcomes	**PO 5**	Communicate accurately the findings of the experiments/ investigations while relating the conclusions/findings to relevant theories of science.
	PO 6	Read texts and research papers analytically and present complex information and the findings of the experiments/investigations while relating the conclusions to relevant courses in science.

APPENDIX-I

Detailed Programme Structure &Syllabus

B.Sc. Human Nutrition – Session June-2023

SEMESTER	COURSE CODE	TITLE OF COURSE	CREDITS	MARKS
First Semester	Discipline Specific Core Courses			
	UGHN.101	Fundamentals of Food and Nutrition	3	100
	UGHN.102	Elementary Anatomy and Physiology	3	100
	UGHN.103	Fundamentals of Nutritional Biochemistry	3	100)
	UGHN.104 (P)	Practical Based on Paper No.101,102,103	4	100
	Skill Enhancement Course			
	HNSEC-01	Life Skills Education	4	100 (30+70)
	Ability Enhancement Compulsory Courses			
	AECEG OR AECHD	Ability Enhancement Course in English Or Ability Enhancement Course in Hindi	4	100 (30+70)
	TOTAL CREDIT 20			600
Second Semester	Discipline Specific Core Courses			
	UGHN.105	Elementary Food Microbiology	3	100 (30+70)
	UGHN.106	Normal and Therapeutic Nutrition	3	100 (30+70)
	UGHN.107	Principles of Food Science and Cooking	3	100 (30+70)
	UGHN.108 (P)	Practical Based on Paper No.105,106,107	3	100
	Skill Enhancement Course			
	HNSEC-02	Food Safety and Standards	4	100 (30+70)
	Ability Enhancement Compulsory Courses			
	AECHRD Or AECHH	Ability Enhancement Course in Human Rights and Duties Or Ability Enhancement Course in Health & Hygiene	4	100 (30+70)
	TOTAL CREDIT		20	600
Third Semester	Discipline Specific Core Courses			
	UGHN.109	Diet Therapy	3	100 (30+70)
	UGHN.110	Food Analysis	3	100 (30+70)
	UGHN.111	Maternal and Child Nutrition	3	100

				(30+70)
	UGHN.112 (P)	Practical based on paper no.109,110,HNSEC-03	3	100
	Skill Enhancement Courses			
	HNSEC-03	Computer Application and Statistics	4	100 (30+70)
	Ability Enhancement Compulsory Courses			
	AECEA Or AESWM	Ability Enhancement Course in Environment Awareness OR Ability Enhancement Course in Solid Waste Management	4	100 (30+70)
	Credits of Third Semester		20	600
Forth Semester	Discipline Specific Core Courses			
	UGHN.113	Nutritional Assessment and Surveillance	4	100 (30+70)
	UGHN.114	Nutrition and Physical Fitness	4	100 (30+70)
	UGHN.115	Food Processing Technology	4	100 (30+70)
	Skill Enhancement Courses			
	HNSEC-04	Techniques of Food Preservation	4	100 (30+70)
	Ability Enhancement Compulsory Courses			
	AECNC Or AECDM	Ability Enhancement Course in Nutrition for Community OR Ability Enhancement Course in Disaster Management	4	100 (30+70)
	Credits of Forth Semester		20	600
FIFTH Semester	Skill Enhancement Course			
	HNSEC-05	Nutritional Challenges in Life Cycle	4	100 (30+70)
	Discipline Specific Elective Courses(DSE)			
	UGHN.116	Food Safety and Quality Control	4	100 (30+70)
	UGHN.117	Public Health and Epidemiology	4	100 (30+70)
	UGHN.118	Nutrition and Health Communication	4	100 (30+70)
	RP-101N	Literature Survey/ Research Project	4	100
	Credits of fifth Semester		20	500
SIXTH Semester	Skill Enhancement Course			
	HNSEC-06	Bakery and Quantity Cookery	4	100 (30+70)
	Discipline Specific Elective Courses(DSE)			
	UGHN.119	Institutional Food Management	4	100 (30+70)
	UGHN.120	Policy program and interventions	4	100 (30+70)
	UGHN.121	Family Meal Management	4	100

				(30+70)
	LS-101N	Literature Survey/ Research Project	4	100
			20	500
Grand Total Credits			120	3600

BACHELOR OF SCIENCE IN HUMAN NUTRITION

FIRST SEMESTER

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 1st
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-101	COURSE TITLE:**FUNDAMENTALS OF FOOD AND NUTRITION**	

COURSE OBJECTIVES:

- To Study the different methods of cooking foods.
- To Obtain knowledge of different food groups, their composition and nutrients present in the foods.
- Understand the vital link between foods, nutrition and health.
- Gain knowledge on functions, requirements and effects of deficiency of nutrients.

COURSE OUTCOMES:

- A successful completion of this course will enable students to Summarize, critically discuss and understand both fundamental and applied aspects of Food Science and Nutrition and Food Production.
- Able to explain functions of specific nutrients in maintaining health.
- Identifying nutrient specific force and apply the principles from the various factors of foods and related disciplines to solve practical as well as real world problems.
- Use current information Technologies to locate and apply evidence-based guidelines and protocol and get imported with critical thinking to take leadership roles in the field of health, diet, special nutritional needs and nutritional counselling.

CREDITS: 4	**TYPE OF COURSE: CORE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-1	**Introduction of Food and Food Groups:**
UNIT:I	**Introduction of Food:**Basic concepts in food and nutrition,Understanding relationship between food, nutrition and health, **Functions of food**-Physiological, psychological and social, Food groups, Food Pyramid. Definition and terms used in Food Science and Nutrition Health, Food, Nutrition, Nutrients.
UNIT :II	**Food Groups:** Selection, nutritional contribution and changes during cooking of the following food groups:- • Cereals • Pulses • Fruits and vegetables • Milk & milk products • Eggs, Meat, poultry and fish • Fats and Oils
BLOCK-II	**Methods of Cooking and Cereals Utility:**
UNIT :III	**Methods of Cooking:** Preventing Nutrient Losses:- Dry, moist, frying and microwave cooking, Advantages, disadvantages and

	the effect of various methods of cooking on nutrients, Minimizing nutrient losses.
UNIT :IV	**Cereals and its Utility:**Germination (Amylase Rich Foods- ARF), fermentation, Parboiling, Gelatinization, Dextrinization, Gluten formation) Pulses and Legumes Fruits, and Vegetables.
BLOCK-III	Nutrient Functions, **Vitamins and Minerals :**
UNIT :V	Nutrient Functions: Definition, Classification, Dietary Sources, Functions, Recommended Dietary Allowances, clinical signs and symptoms of Deficiency diseases and Excess of Energy. Carbohydrates, lipids and proteins.
UNIT :VI	**Vitamins:** • Fat soluble vitamins-A, D, E and K • Water soluble vitamins –vitamin B12 and vitamin C
UNIT-VII	**Minerals :** Definition, Classification, Distribution of minerals in the body, Functions, sources, requirements and effects of deficiencies micro minerals and macro minerals.

Recommended BookReadings:

- Maney S (2008). Foods, Facts and Principles, 3rd Edition Published by Wiley Eastern, New Delhi.
- Usha Chandrasekhar (2002) Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi.
- Basic Food Preparation: A Complete Manual, 4th Edition, Orient Black Swan Ltd, Mumbai.
- Srilakshmi, B. (2017) Nutrition Science, New Age International (P) Ltd., New Delhi,
- Mahtab, S. Bamji, Kamala Krishnasamy, Brahmam G.N.V (2012) Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- Sunetra Roday (2017). Food Science and Nutrition, Oxford University Press, New Delhi
- Indian Food Composition• Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
- Practical Manual, Revised Edition. Elite Publishing House Pvt Ltd. Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). Basic Food Preparation:

Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 1ST
PROGRAMME: HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE: UGHN-102	COURSE TITLE:ELEMENTARY ANATOMY AND PHYSIOLOGY	

COURSE OBJECTIVES:

- To give theoretical concepts to complex physiological systems of the human body through scientific enquiry into the nature of mechanical, physical and biochemical function of humans, their organs and cells of which they are composed.
- To approach the subject area from variegated angles to equip the students with the knowledge of importance of normal and altered picture of biological markers and suggest remedies.

COURSE OUTCOMES: This course will help students to: -

- Apply knowledge in understanding interrelationship between physiology and nutrition.
- Enable to act as a reliable team member in healthcare team in medical and nonmedical setups.
- Apply the acquired techniques for population education.

CREDITS: 4	**TYPE OF COURSE: CORE**
MAXIMUM MARKS :100	**MINIMUM MARKS: 36**

BLOCK-1	**INTRODUCTION TO HUMAN BODY:**
UNIT 1:	**HUMAN BODY:** Organs, tissue and cell, cell structure, cellular organelles and their functions.
UNIT 2:	**BLOOD AND LYMPHATIC SYSTEM:** Blood - Composition and functions. • Plasma Protein -Composition and functions. • Lymphatic system: Lymphatic system structure and function • Structure and functions of lymph node and lymphatic ducts (Right lymphatic duct & Thoracic Duct)
UNIT 3:	**CARDIO VASCULAR SYSTEM:** Anatomy of Heart and blood vessels - -Innervations of heart - Properties of cardiac muscle - Control of cardiac cycle and circulation - Cardiac output - Blood pressure.
BLOCK-2 : DIGESTIVE, RESPIRATORY, EXCRETORY SYSTEM:	
UNIT 4:	**DIGESTIVE SYSTEM:** Overview of the Gastrointestinal Tract, organization and functions. Structure and functions of: Stomach, Liver, Gallbladder, Pancreas.
UNIT 5:	**RESPIRATORY SYSTEM:** Anatomy-Gross & Histological - Mechanism of Breathing, Exchange of gases Pulmonary function tests-lung volumes - Control of respiration.
UNIT 6:	**EXCRETORY SYSTEM:**Anatomy-Gross& Histology-Structure and functions of kidney and nephrons.
BLOCK 3: ENDOCRINE, REPRODUCTIVE SYSTEM:	
UNIT 7:	**ENDOCRINE SYSTEM:** Overview of endocrine system, feedback mechanism, Structure of main endocrine glands and their functions: Pituitary, Thyroid, and

	Pancreatic hormones.
UNIT 8:	**REPRODUCTIVE SYSTEM:** Anatomy - Gross & History of Male reproductive system - Spermatogenesis. Female reproductive system - Ovarian hormones, Menstruation, Pregnancy, Parturition, Lactation.
BLOCK 4: MUSCULO-SKELETAL, CENTRAL NERVOUS SYSTEM:	
UNIT 9:	**MUSCULO-SKELETAL SYSTEM:**Muscle - Classification - Histology - properties of each type - distribution - Mechanism of muscle contraction (Brief) - neuromuscular transmission (Brief), ligaments, tendons, Skeleton-Bones-types, Structure & function, Spinal column. Joints - Types, Structure, Function.
UNIT 10:	**CENTRAL NERVOUS SYSTEM:** Anatomy - Gross - Cerebrum, cerebellum, Spinal cord. Histology - Nerve - structure and properties of neurons - Nerve - Action Potential - generation propagation - factors influencing.

Recommended Book Readings:

- Chaterjee CC. 2012. Human Physiology Vol. I and Vol. II. CBS Publications.
- Donnersberger AB and Scott AL. 2005. Laboratory Textbook of Anatomy and Physiology. 8th Edition, Jones and Bartlett Learning, Burlington, Massachusetts.
- Jain AK. 2009. Human Physiology for BD. 3rd Edition, Avichal Publishing Company, New Delhi.
- Hall JE. 2016. Gayton and Hall Text Book of Medical Physiology. 13th Edition, Elsevier India.
- Marieb EN. 2004. Human Anatomy and Physiology 6th Edition. Pearson Education, Inc. London.

Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA
Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 1ST
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-103	COURSE TITLE:**FUNDAMENTALS OF NUTRITIONAL BIOCHEMISTRY**	

COURSE OBJECTIVES:

- To discuss the clinical process and chemical control
- To discuss the genetic and chemical control
- To discuss nutrition, drugs and digestion

COURSE OUTCOMES:

- CO1: Learners will be able to develop an understanding of the principles of biochemistry.
- CO2: Learners will be able to understand obtain and insight into the chemistry of major nutrients and physiologically compounds.
- CO3: Learners will be able to understand the biological processes and systems as applicable to human nutrition.

CREDITS: 4	**TYPE OF COURSE: CORE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK:I	**INTRODUCTION TO BIOCHEMISTRY: CARBOHYDRATES and LIPIDS:**
Unit I:	**INTRODUCTION TO BIOCHEMISTRY**: Definition, objectives, scope and inter-relationship between biochemistry and other biological sciences.
Unit II:	**CARBOHYDRATES**: Definitions, classification, Digestion and absorption, structure and general properties of: • Monosaccharide's-glucose, fructose, galactose ribose. • Disaccharides – maltose, lactose, sucrose. • Polysaccharides – dextrin, starch, glycogen.
Unit III:	**LIPIDS:** Definitions, Digestion and absorption and classification of lipids. • Types and properties of fatty acids. • Composition and properties of fats. • Significance of acid value, iodine value and saponification value.
BLOCK: II	**INTRODUCTION TO PROTEINS AND ENZYMES:**
Unit IV:	**PROTEINS:** Definition, Digestion and absorption ,classification, and structure of amino acids. • Essential and non-essential amino acids. • Definition, classification, elementary knowledge of structure of proteins.
Unit V:	**ENZYMES:** Introduction to Enzymes, Co-enzymes, Enzyme Inhibition
BLOCK:III	**INTRODUCTION TO VITAMINS AND MINERALS**
unit VI:	
	VITAMINS :- Structure and biochemical role: Fat soluble vitamins – A, D,E,K Water soluble vitamins – B1, B2, niacin, pyridoxine, folic acid, B12 and C
Unit VII:	**MINERALS :** Biological role and occurrence of inorganic elements • Iron, calcium, phosphorous, • Iodine, selenium and zinc

Recommended Book Readings:

- Lehninger A L, Nelson D L and Cox M M (2009).
- Principles of Biochemistry, 6th Ed.

- CBS Publishers and Distributors.
- Murray R.K, Granner D K, Mayes P A and Rodwell V W (2009).
- Harper's Biochemistry,
- Lange Medical Book.

Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 1ST
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :HNSEC-01	COURSE TITLE: LIFE SKILLS EDUCATION	

LEARNING OUTCOMES:

- Develop insight into life skills and its crucial role in coping with challenges and improving quality of life.
- Comprehend the core life skills and learn strategies to develop these skills in self as well as others through life skills education.
- Learn the components, principles and skills to design and implement effective life skills education programme.

LEARNING OUTCOMES:

- Define life skills and describe different life skills as well as its relevance for emergingadults and youth in contemporary context.
- Explain importance of life skills education from individual, interpersonal, familial andsocietal perspectives.
- Demonstrate abilities to use participatory approach and effective communication strategies

in implementing life skills education programme.

- Critically evaluate the content and implementation of life skills education programmes.
- Design age appropriate and culturally relevant life skills education curriculum.

CREDITS: 4	**TYPE OF COURSE: SKILL ENHANCEMENT COURSE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I: INTRODUCTION OF LIFE SKILLS	
UNIT I:	**Concept and meaning of life skills:** • Definitions and concept of life skills and life skills education. • Importance in daily living; Criteria for using life skills.
UNIT II:	• Evolution of Life Skills • Core Life Skills- classification and concept
UNIT III:	• Theoretical perspectives and models to understand life skills education.
BLOCK-II:COMPONENTS FOR PLANNING & ORGANIZING LIFE SKILLS PROGRAMS	
UNIT IV	**Understanding group characteristics and needs** : **Life skills in context:** Importance of focusing on contextual specificities and cultural Ideologies as important aspects affecting individual ideas. Focusing on cultural practices that govern everyday life.
UNIT V	• Analyzing the gender nuances that exist within the group. • Self-components to imparting life skills program: critical thinking skills, decision making
UNIT VI	**Skills:** interpersonal communication skills, coping with stress and emotions; self-management skills, etc.
BLOCK-III:IMPORTANCE OF COMMUNICATION IN IMPARTING LIFE SKILLS EDUCATION	
UNIT VII	Concept and Importance of communication • Aspects to develop social potentials (effective listening, speaking, building and • maintaining relationships, understanding group dynamics and functioning in groups, delegating responsibilities)
UNIT VIII	**Core Approaches and Strategies to Implement Life Skills** Program Understanding and developing self-skills/potential: self-awareness, self-esteem self-confidence, creative thinking,

	interpersonal skills, etc. • Use of participatory techniques and methods: Individual exercises, Group activities, • Games etc. Communicating with the audience: receiving feedback, handling questions, etc.
	A. Organizing a Life Skills Program Planning a need based viable life skills program (select components) • Determining the purpose, collecting materials, organizing content. • Getting prepared for the presentation: psychological level • Delivering the presentation
	B. Life Skills Assessment Scales and quantitative techniques • Qualitative approach
UNIT-IX	**Life Skills and Youth Development**: • Adolescence and Youth- Definitions, Conception- socio cultural perspectives • Youth demographics and role in society • Challenges of adolescence and youth development • Formal and non-formal approaches to youth development • Positive Youth Development

Recommended Book Readings :

- Agochiya D. 2010, life competencies for adolescents. Training manual for facilitators, teachers and parents. Sage Publications.
- Dakar Framework for Action,(2000).Education for All: Meeting our Collective Commitments,

Dakar, Senegal Peace Corps, OPATS.2001, Life Skills Manual.

- Robbins S.P, Hunsaker P.L, Training in Interpersonal Skills (5th eds), PHI Learning Pvt. Ltd.
- National Aids Control Orgnization, 2008, Adolsecence Education Programme, Life Skills

Development.

- Nair. A. Radhakrishnan, (2010). Life Skills Training for Positive Behaviour , Rajiv Gandhi National Institute of Youth Development, Tamil Nadu. Nair .V. Rajasenan, (2010).

Suggested Online Readings:

- Life Skills, Personality and Leadership, Rajiv Gandhi National Institute of Youth Development, Tamil Nadu. Url: multimedia.peacecorps.gov/.../pdf/.../M0063_lifeskillscomplete.pdf

Url: www.nacoonline.org/.../AEP%20-%20Teachers%20Workbook.pdf

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 1ST
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :AECEG	COURSE TITLE:ABILITY ENHANCEMENT COURSE IN ENGLISH	

COURSE OBJECTIVES:

- **To know about the English language perfectly.**
- **To understand the literature, comprehensive and stories of English.**
- **To become proficient in English language.**

COURSE OUTCOMES:

- CO1: Learners will be able to understand the language English.
- CO2: Learners will be able to understand the writing and spoken English.
- CO3: Learners will be able to understand all the subject related content very easily.

CREDITS: 4	**TYPE OF COURSE: ABILITY ENHANCEMENT COURSE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

AECEG-01

BLOCK-1 ENGLISH-I READING COMPREHENSION, LISTENING AND PASSAGE FOR READING

Unit-1	Reading Comprehension – Passage for reading from George Orwell: Animal form, Glossary Vocabulary, Grammar and usage – concord of number and person be, do, have, and writing.
Unit-2	Passage for reading. Human Environment by India Gandhi, Vocabulary.
Unit-3	Passage for reading: The Nightingle and the rose, by oscawild, vocabulary, Grammar: The past indefinite, Past continuous, Present perfect tense, present perfect continuous tense.
Unit-4	Passage for reading: Deth in the Kichen by milward Kennedy, Grammar: Past Indefinite tense, Past perfect tense.
Unit-5	Listening comprehension, conversation, pronunciation-letters and sounds, word stress.
Unit-6	Listening Comprehension: Talk: the Scientific method, conversation, pronunciation, English novels.

BLOCK-2 ENGLISH-I

Unit-7	Reading Comprehension – Story Norah Burke: the Baby sister, Grammar and usage – use of the past perfect tense.
Unit-8	Reading Comprehension: Story O, theory: Witches leaves, Grammar and usage – simple present tense, present continuous tense, Rewriting a story in an abridged form.
Unit-9	Reading comprehension: Autobiography – passage from India Gandhi: A page from the book of memory, Grammar and usage: Articles, writing : Essay – should the death penalty by abolished ?
Unit-10	Reading comprehension: The time kinds of workers, vocabulary. The suffixes –er-or-ary-cer, ier, grammar and usage, types of sentences, writing. Essay based on diagram: Classification of vertebrates.

Unit-11	Listening Comprehension: A lecture on the burden of women in the villages. Conversation. A dialogue between two passengers on a railway train. Pronunciation: English Consonants.
Unit-12	Listening Comprehension: A talk on dreams. Conversation: Dialogues taking about the dreams one had recently, Pronunciation: stress and rhythm, vowed contrasts, reading words from phonetic. Transcription.
BLOCK-3ENGLISH-I	
Unit-13	Reading Comprehension – Detective story Agatha Christie, The Jewel Robbery at the grand metropolitan, grammar and usage- Question patterns, writing – Rewriting a story from the point of view of one of the characters.
Unit-14	Reading Comprehension – Autobiography Ved Mehta: A world of four senses, Grammar and usage: Prepositional phrases, participial phrases: Phrasal verbs, relative clauses, writing : A short composition based on the passage read.
Unit-15	Reading Comprehension – Doris Lessing: A mild attack of locusts, Grammar and usage – Adverbial clauses, writing. Descriptive composition based on the passage read.
Unit-16	Reading Comprehension: Myster story Wibla Cather: The affair at Grover station, Exercise on vocabulary, Grammar and usage: Direct and Indirect speech, writing: Narrative composition.
Unit-17	Listening Comprehension: Talk Life of Albert Einstein, Conversation. A dialogue between a teacher and a student who has just passed the higher secondary examination.
Unit-18	Listening Comprehension: Talk Anthony R. Michaelis Science and politics, conversation Asking for permission, Pronunciation, consonants, contracted forms.
AECEG-02	
BLOCK-1 ENGLISH-II	
Unit-1	Writing paragraphs 1 – The topic sentence, developing the topic, coherence, punctuation: the full stop.
Unit-2	Writing paragraphs 2 – The development of a paragraph – description, cause and effect, definition, comparison and contrast.
Unit-3	Writing a composition – A model composition for study, types of composition, what you must do before writing your compassion, Factors to keep in mind when writing your composition.
Unit-4	Expository composition – Development of an expository composition, A model composition.
Unit-5	Note-Taking-1- How to read, specimen notes, Reduction devices, Passage four note taking, Headings and subordinate points.
Unit-6	Writing reports 1- Reporting events- Different Stages in writing impart, types of report, reporting an event.
BLOCK-2 ENGLISH-II	

Unit-7	Argumentative composition-1- Persuasive and argumentative composition, composition and argument.
Unit-8	Argumentative composition-2- Inductive and deductive methods, Fallacies, Non rational ways of writing, A model passage.
Unit-9	Note taking -2 use of tables and Diagrams – Organization of notes : Tables, organization of note : Diagrams.
Unit-10	Writing reports-2 Reporting meetings and speeches – reporting a meeting, Reporting a speech, Punctuation: Quotation marks.
Unit-11	Writing summaries -1 – The technique of summarizing.
Unit-12	Writing Summaries – 2
BLOCK-3ENGLISH-II	
Unit-13	Writing paragraphs-3 – Chronological sequence, spatial Relationships, class relationships.
Unit-14	Narrative Composition-1- Writing a narrative composition, Factual report.
Unit-15	Narrative composition-2- Samples of writing, style.
Unit-16	Writing reports-3 – Reporting interviews – Different stages in conducting interviews, Reporting an interview, punctuation: The apostrophe, Usage, Word study.
Unit-17	Writing reports-4 Reporting Surveys – Various stages in conducting a survey, collection of data, Reporting a survey.
Unit-18	Writing summaries-3- Techniques of summarizing.
BLOCK-4ENGLISH-II	
Unit-19	Descriptive Composition-1 – Describing person's size. Build and Age, Educational Qualifications and work experience, Facial features and expression, Gestures and Gait, Habits, Dress, Likes, Dislikes and general nature, activity.
Unit-20	Descriptive Composition-2- Describing plans and objects- Location and size, sounds and smells. The objects Associated with a place, Describing particular objects, Activity.
Unit-21	Descriptive composition-3 – Describing conditions and processes.
Unit-22	Note taking-3- A good listener, Some basic equipment for note taking parts of a lecture, taking notes from a lecture, Reconstructing notes.
Unit-23	Writing reports-5- Reporting experiments- various steps in conducting an experiment, Reporting and experiment, examples of reports, punctuation: commas.
Unit-24	Summing Up-writing paragraph, composition, note taking writing reports, writing summaries.

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 1ST
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :AECHD	COURSE TITLE:ABILITY ENHANCEMENT COURSE IN HINDI	

COURSE OBJECTIVES:

- **To better understand the Hindi language literature.**
- **To become proficient in Hindi Language.**
- **To know about the writing and spoken Hindi.**

COURSE OUTCOMES:

- CO1: Learners will be able to understand the language Hindi.
- CO2: Learners will be able to understand the writing and spoken Hindi.
- CO3: Learners will be able to understand all the subject related content very easily.

CREDITS: 4	**TYPE OF COURSE: ABILITY ENHANCEMENT COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

खण्ड–1	**भाषातत्वऔरबोधन**
इकाई–1	**हिन्दी की लिपि औरवर्तनी का परिचय –** भाषाऔर लिपि, देवनागरी लिपि, वर्तनी के कुछनियम।
इकाई–2	**हिन्दी की ध्वनियाँ –** ध्वनियाँ और शब्द, ध्वनियाँ औरउच्चारण की विशेषताएँ, लहजा या अनुतान, ध्वनिऔरलेखन के विविध सम्बन्ध, उच्चारण, भिन्नता के कारणवर्तनी की समस्याएँ, उच्चारणमेंअन्तर, लिपि मेंअन्तर, ध्वनिऔर लिपि मेंअसामंजस्य।
इकाई–3	**विज्ञान के विषय का बोधन–** मानव की उत्पत्तिऔरविकास, भाषा की सरलअभिव्यक्ति, उर्दु के शब्द, व्याकरणिकविवेचन (संभावनार्षक वाक्य, संदेहार्षक वाक्य)।
इकाई–4	**संस्कृतिविषय का बोधनऔर शब्दकोश का उपयोग–** भात के त्योहार, शब्दकोश का उपयोग।
इकाई–5	**समाजविज्ञानविषयों का बोधनऔरनिबन्ध रचना का परिचय –** परिवार, निबन्धनरचना, व्याकरणिकविवेचन (प्रत्यय 'त्व' 'ता', 'य', 'करण')।
इकाई–6	**भाषण शैली–** भाषण का उदाहरण, उसकी शैलीगतविशेषताएँ, संबोधनकारक।
खण्ड–2	**वाचनऔरविविध विषय**
इकाई–7	**सामाजिकविज्ञानों की भाषा (इतिहास के सन्दर्भ में) तथावर्तनी के कुछनियम–** पृष्ठभूमि, (ईस्ट इंडियाकम्पनी, अंतिममुगलबादशाह, राजनीतिपरअंग्रेजी का अधिकार एवं शोषणनीति, 1857 की क्रान्ति, सांस्कृतिक जागरण), कांग्रेस की सीापना, गाँधीजी का आगमन, भारत छोड़ोआन्दोलन, वर्तनीसम्बन्धीकुछनियम (प्रत्ययों से शब्द–रचनावर्तनी के दो रूप (जैसे–नये, नए), पाठमेंप्रयुक्त शब्द शब्दों की वर्तनी की विशेषताएँ), शब्दावली।
इकाई–8	**समाजिकविज्ञानों की भाषा (राजनीति विज्ञान) तथा शब्दरचना–** रचनालोकतन्त्र (राजनीतिक, आर्थिकसमानता, धर्म निरपेक्षता), परिभाषिक शब्दावली का प्रयोग, व्याकरणिकविवेचन ('वि' उपसर्ग, विलोम शब्द, उपसर्गलगाकरविलोम शब्दबनाना, संधि, समास)।
इकाई–9	**मानविकी की भाषा (ललित कला) तथाविशेषण–** भारत की ललितकलाएँ, व्याकरणिकविवेचन (विशेषण कोसंज्ञामेंबदलना, प्रविशेषण), वाक्य रचना।
इकाई–10	**विज्ञान की भाषातथापरिभाषिक शब्द–** पैट्रोलियम, (पृथ्वी का जन्म, प्रथमजीवों का सृष्टि, चट्टानोंम के भेद, पैट्रोलिय के

	मूल स्त्रोत, निस्यंदनतेल, तेलकुण्डों की खोज, तेलकूपों का खनन, तेल का शोधन, भारतीय स्थिति), परिभाषितक शब्द।
इकाई–11	**विज्ञान की भाषा का स्वरूप–** मानवप्रगतिऔरपर्यावरण, पारिभाषिक शब्द, भाषिकविवेचन।
खण्ड–3	**साहित्य का आस्वादन**
इकाई–12	**विधि एवंप्रशासन की भाषातााापारिभाषिक शब्दऔरअर्थ–** राजभाषाहिन्दी, हिन्दी का संविधानिकस्थिति, संविधान की व्यवस्था के आधारपर की गईकार्यवाई, राजभाषाअधिनियम (यथा संशोधित) 1967, राजभाषानियम 1976, भाषाविवेचन (राष्ट्रभाषा, सम्पर्कभाषा, राजभाषाहिन्दी का स्वरूप), शब्दावली, भाषिकविवेचन।
इकाई–13	**कहानी : पूस की राज –** कहानी का सार, सन्दर्भसहितव्याख्या, कथावस्तु, चरित्र–चित्रण, परिवेश, संरचनाशिल्प, प्रतिपाद्य।
इकाई–14	**उपन्यास : मानस का हंस (अमृत लाल नगर) –** कथासार, कथावस्तु, चरित्र–चित्रण, परिवेश, संरचनाशिल्प, प्रतिपाद्य।
इकाई–15	**नाटक : चन्द्रगुप्त (जयशंकर प्रसाद) –** कथासार, कथावस्तु, चरित्र–चित्रण, परिवेश, संरचनाशिल्प, प्रतिपाद्य।
इकाई–16	**निबन्ध : क्रोध (रामचन्द्र शुक्ल) –** निबन्ध का सार, अंतर्वस्तु (विचारपक्ष, भावपक्ष), लेखकीय व्यक्तित्व की अभिव्यक्तिसंरचनाशिल्प (शैली, भाषा), प्रतिपाद्य।
इकाई–17	**गाँधी की आत्मकथा–** अंतर्वसतु, चरित्र, विश्लेषण, परिवेश, संरचनाशिल्प, प्रतिपाद्य।
इकाई–18	**कविताएँ : सूरदास–** काव्यवाचन (बालवर्णन, विनय औरवियोग– भ्रमरगीत), भावपक्ष, संरचनाशिल्प, प्रतिपाद्य, संदर्भसहितव्याख्या (शोभित करनवनीत, चरनकमलबन्दौहरिराई, निरगुनकौनदेसको बासी)।
इकाई–19	**तुलसीदास–** काव्यवाचन (रामचरित्र मानस, विनय पत्रिका, गीतावली), भावपक्ष, संरचनाशिल्प, प्रतिपाद्य, संदर्भसहितव्याख्या (मनि मानिकमुकलाछविजैसी, कबहुँकहौ यहिरहनिरहौगो, मेरी सब पुरूषारथ थाको)।
इकाई–20	**मैथिलीशरणगुप्त–** काव्यवाचन (महाकाव्य साकेत), भावपद्वा, संरचना, शिल्प, प्रतिपाद्य, सन्दर्भसहितव्याख्या (सखि, पतंगभीजलताहैहा! दीपकभीजलताहै।सखि, नीलनभस्सरमें उतरा)।
इकाई–21	**सूर्यकान्त त्रिपाठी 'निराला' –** काव्य वाचन, भावपद्वा, संरचनाशिल्प, प्रतिपाद्य, संदर्भसहितव्याख्या (तोड़ती पत्थर)।
इकाई–22	**महादेवीवर्मा–** काव्य वाचन, (गीत), भावपक्ष, संरचनाशिल्प, प्रतिपाद्य, संदर्भसहितव्याख्या (मैं नीलभरी दुख की बदली)।
खण्ड–4	**व्यावहारिकहिन्दीऔरलेखन**
इकाई–23	**शब्दऔरमुहावरे–** शब्दों का महत्व, भाषा के सामाजिकस्तरभेद, शबदों के विभिन्न स्त्रोत (तत्सम, तद्भव, देशज, विदेशी शब्द), शब्दों का अर्थपक्ष (समरूपी शब्द, पर्याय विलोम, अनेकार्थी, सहप्रयोग), शब्दनिर्माण शबदरचना (मूल शब्द, व्युत्पन्न शब्द, उपसर्ग, प्रत्यय, भाववाचकप्रत्यय, लघुतासूचकप्रत्यय, लिंगसूचकप्रत्यय, समाज, पुनरूक्त शब्द, प्रतिबिंबित शब्द, अनुकरणात्मक शब्द) मुहावरेऔरलोकोक्तियाँ (अर्थ औरवाक्य–प्रयोग)।
इकाई–24	**संवाद शैली–**

	वाक्य तार्तालाप की विशेताएँ वाक्य (वाक्य मेंपदक्रम, अनुतान, सम्प्रेषण का उद्देश्य वाकय से ऊपर का स्तर(प्रोक्ति), विरामचिनहों का प्रयोग) वार्तालाप– एक उदाहरण, उदाहरणपरचर्चा (अनुतान, बलाघातकोडमिक्सिंग, प्रान्तीय विशेषताएँ, हिन्दी शैली, उर्दू शैली, मिलीजुली शैली)।
इकाई–25	**सरकारीपत्राचारतथाटिप्पणऔरप्रारूपण–** पत्र–लेखन के प्रकार (अनौपचारिक, (व्यक्तिगत) पत्र, औपचारिकपत्र) सरकारीपत्राचार की प्रक्रिया (टिप्पण, प्रारूपण) सरकारीपत्राचार के विभिन्नप्रकार व उनके नमूने (सरकारी पत्र, अर्धसरकारीपत्र, कार्यालय ाापन, कार्यालय आदेश, आदेश, पृष्ठांकन, अधिसूचना, संकल्प, प्रेसविज्ञप्ति, प्रेसनेट, अंतर्विभागीय टिप्पणी, तार, टेलेक्ससंदेश, तुरन्तपत्र) शब्दावली।
इकाई–26	**समाचारलेखनऔरसम्पादकीय –** समाचारक्याहै? समाचारलेखनऔरसंपादन, समाचार की भाषा, सम्पादकीय लेखन।
इकाई–27	**अनुवाद–**'अनुवाद' शब्द का अर्थऔरव्याख्या, अनुवाद की प्रक्रिया (अर्थग्रहण, संप्रेषण), अनुवादकरने का व्यावहारिकज्ञान।
इकाई–28	**संक्षेपण, भाव–पल्लवनऔरनिबन्ध –लेखन–**महत्व, स्वरूप, प्रक्रिया।

SECOND SEMESTER

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 2nd
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-105	COURSE TITLE:ELEMENTARY FOOD MICROBIOLOGY	

COURSE OBJECTIVES: This course will enable the student to-

- Understand the nature of microorganisms involved in food-spoilage, food-infections and intoxicants. Food biotechnology.
- Understand the importanceof micro-organisms in food biotechnology.
- Understand the principles of various methods used in the prevention and control of the micro-organisms in foods.
- Understand the criteria for microbiological safety in various food operations to avoid public health hazards due to contaminated foods.

COURSE OUTCOMES:

- CO1: Learners will be able to understand the nature of microorganisms involved in food spoilage of food infections and intoxications.
- CO2: Learners will be able to understand the importance of microorganisms in food biotechnology.
- CO3: Learners will be able to understand the principle of various methods used in the prevention and control of the microorganisms in foods.
- CO4: Learners will be able to understand the criteria for microbiological safety in various food operations to avoid public Health hazards due to contaminated foods.
- CO5: Learner should be able to understand the role of microorganisms responsible for food spoilage and the methods used for prevention and control are the main highlights of this course.

CREDITS: 4	**TYPE OF COURSE: CORE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I : INTRODUCTION OF MICROORGANISM	
Unit I:	**Brief History of Microbiology:** Introduction important microorganism in foods.
Unit II:	**Cultivation of Microorganisms:** Nutritional requirement of microorganisms,Types of media used coma methods of isolation.
Unit III:	**Primary Sources of Microorganisms in Foods:**physical and chemical methods used inthe destruction of microorganisms (sterilization and disinfection).
BLOCK-II :CONTROL OF MICROORGANISM AND FOOD SPOILAGE	
Unit IV:	**Fundamentalsofcontrol of microorganism in foods:** Extrinsic and intrinsic parametersaffecting growth and survival of microbes use of high and low temperature comedy Hydration, freezing freeze drying irradiation and preservatives in food preservation.
Unit V:	**Food spoilage:** Contamination and microorganism in food in the spoilage of differentKinds of food and their preservation. Cereal and cereal products vegetable and fruits,fish and other sea foods meat and meat products poultry, milk and Milk products, Canned foods.
BLOCK-3 :PUBLIC HEALTH HAZARDS	
Unit VI:	**Public Health Hazards Due to Contaminated Foods:** Foodborne infections andintoxications- symptoms, mode and sources of transmission and methods of preservation. Investigation and detection of foodborne

	diseases.
Unit VII:	**Microbes:** Used in biotechnology, fermented foods and their benefits.

Recommended Book Readings:

- Mahtab, S, Bamji, Kamala Krishnasamy, Brahmam, G.N.V. (2012)
- Text Book of HumanNutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- Srilakshmi, B. (2013), Dietetics, New Age International (P) Ltd., New Delhi.
- SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.
- Longvah, T, Ananthan, R, Bhaskarachary, K, Venkaiah, K. (2017). Indian Food Composition Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
- Shakuntala Manay, Shadaksharaswamy. M (2013) Foods, Facts and Principles, New• Age International Pvt Ltd Publishers, 2nd Edition) Ltd., New Delhi. Swaminathan, M. (2012)
- Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.

Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 2nd
PROGRAMME : HUMAN NUTRITION	PROGRAMME : 1116	
COURSE CODE :UGHN-106	COURSE TITLE:NORMALAND THERAPEUTIC NUTRITION	

COURSE OBJECTIVES:

- To understand the role of dietician and to maintain good nutritional status, correct deficiencies or disease conditions of the patients Gain knowledge on the principles of diet therapy and designing or formulating different
- Therapeutic diets for various disease conditions Develop skill to plan and prepare therapeutic diets for prevention of disease conditions
- Diet therapy may include prescribing specialized dietary regimes or meal plans. AsEntrepreneur.

COURSE OUTCOMES:

- Integrate knowledge of research principles and methods associated with nutrition and dieteticspractice.
- Use effective and appropriate communication skills in providing information, advice andprofessional opinion to individuals, groups and communities.
- Collect, organize and assess data relating to the health and nutritional status of individuals, groups and populations.
- Demonstrate initiative and judgment using a professional, ethical and entrepreneurialapproach advocating for excellence in nutrition and dietetics.
- Independently plan and execute a research project in regard to nutrition and dietetics practice.

CREDITS: 4	**TYPE OF COURSE: CORE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Concepts in Diet TherapyandMedical Nutrition Therapy I	
UNIT-I	**Concepts in Diet Therapy**: Growth and Scope of Dietetics, Purposes and Principles of therapeutic Diets, Modifications of Normal Diet, Classification of the Therapeutic Diets, Role of Dietitians, Characteristics of Dieticians, Hospital Dietary Food Service, Diet Counseling, Team Approach to Nutritional Care, Principles of Food Prescription Indian Dietetic Association, Computer Assisted Instructions (CAI) - Diet Planning using computers, Use of Technology in diet.
UNIT-II	**Medical Nutrition Therapy I :** Obesity, Underweight and Diabetes Mellitus Etiology, Path physiology, Clinical symptoms, metabolic alterations, Assessment/Indicators, Lifestyle & Dietary guidelines for the following conditions Obesity (Bariatric Surgery: types, Management), Underweight Diabetes Mellitus (Acute and Chronic Complications of Diabetes Diet Modifications, Use of Food Exchange Lists, Insulin-Types and Use, Oral Hypoglycemic Agents, Carbohydrate counting, Glycemic Index, Glycemic Load)
BLOCK-II Medical Nutrition Therapy in Gastrointestinal Disorders and Cardio Vascular System and Kidney:	
UNIT-III	**Medical Nutrition Therapy in Gastrointestinal Disorders:** Diseases of the liver Etiology, Path physiology, Clinical Symptoms, Assessment/Indicators, Lifestyle & Dietary guidelines for the following conditions Diarrhea, Dysentery, Constipation and Peptic Ulcer Jaundice Hepatitis Fatty Liver Cirrhosis Hepatic Coma
UNIT-IV	**Medical Nutrition Therapy in Diseases of the Cardio Vascular System and Kidney**: Diseases Etiology, Path physiology, Clinical Symptoms, Lifestyle & Dietary guidelines for the following conditions: Atherosclerosis, Hyper lipidemia, Ischemic Heart Disease, Congestive Heart Failure, Bypass Surgery Hypertension (DASH Diets) Nephrotic Syndrome nephron lithiasis Acute and Chronic Renal
UNIT-V	**Medical Nutrition Therapy for Fever, Food Allergy and Cancer Febrile Conditions:**

	Acute and chronic infectious disease-Typhoid, Tuberculosis and HIV and AIDS a. Guidelines for management of tuberculosis and infectious diseases. Food Allergy - Definition, Causes, Science and Symptoms, Types of Allergy, Diagnosis, Dietary Modifications Gluten sensitivity and Lactose intolerance Cancer: Etiology, Metabolic alterations, Types of Cancer, Dietary Recommendation for Cancer Survivors. Nutritional therapy for Cancer.

Recommended Book Readings:

- Mahtab, S, Bamji, Kamala Krishnasamy, Brahmam, G.N.V. (2012)
- Text Book of HumanNutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- Srilakshmi, B. (2013), Dietetics, New Age International (P) Ltd., New Delhi.
- SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.
- Longvah, T, Ananthan, R, Bhaskarachary, K, Venkaiah, K. (2017). Indian Food Composition Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
- Shakuntala Manay, Shadaksharaswamy. M (2013) Foods, Facts and Principles, New• Age International Pvt Ltd Publishers, 2nd Edition) Ltd., New Delhi. Swaminathan, M. (2012)
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Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 2nd
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-107	COURSE TITLE:PRINCIPLESOF FOOD SCIENCE AND COOKING	

COURSE OBJECTIVES:

- To expose the students in understanding the changes in foods during various processing methods in laboratory setups.
- To equip the students in understanding the desirable and undesirable effects of food treatments and identify the best ones for the benefit of consumers as food or trade.

COURSE OUTCOMES: After completion of this course, the students are expected to:

- Appreciate the scientific foundation of food and its application to the benefits of human health
- Perform as Food Analyst
- Become Food Entrepreneurs
- Act as Health/ Nutrition advisor

CREDITS: 4	**TYPE OF COURSE: CORE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Evaluation of Food and sugars and starches Carbohydrates in foods sources:	
UNIT-I	**Evaluation of Food:** Colloidal chemistry as related to foods; Evaluation of food by subjective and objective methods.
UNIT-II	**Characteristics of sugars and starches Carbohydrates in foods sources; Characteristics of sugar;** Starches - types, sources, uses and chemical characteristics; Factors effecting viscosity of starch paste; Characteristics of cellulose and pectin; Gums in foods; Effect of cooking and processing techniques on carbohydrates; Batters and dough- types, properties.
BLOCK-II Processing of cereals, legumes and animal foods, Fruits and Vegetables:	
UNIT-III	**Processing of cereals, legumes and animal foods Preparation of gluten structure;** Dough changes in baking; Protein in foods: Plant and animal protein; Chemical and physical properties related to protein foods; Effect of cooking and processing techniques on animal foods – meat, fish, poultry, eggs, milk and milk products; Effect of cooking and processing of plant foods – cereals, millets, legumes, nuts and oilseeds;
UNIT-IV	**Processing of fruits and vegetables Classification and importance of fruits and vegetables;** Composition of fruits and vegetables. Effect of cooking and other processing methods on the nutritive value of fruits and vegetables; Food pigments; Browning reactions in fruits and vegetables; Classification and importance of beverages; Definition, classification, uses and legal aspects of food additives; Classification, nature and uses of leavening agents.

Recommended Book Readings:

- Belle Lowe. 2019. Experimental Cookery from the Chemical and Physical Standpoint. Facsimile Pub.
- Potter NN and Hotchkiss JH. 2007. Food Science. 5th Edition, CBS, New Delhi.
- Roday S. 2018. Food Science and Nutrition. 3rd Edition, Oxford University Press, UK.
- Sharma A. 2005. Textbook of Food Science and Technology. 3rd Edition, CBS, New Delhi.
- Stone H. 2004. Sensory Evaluation Practices (Food Science and Technology). 3rd Edition, Academic Press, Cambridge.
- Subbalakshmi G and Udipi SA. 2006. Food Processing and Preservation. New Age International, New Delhi.
- Sofia Jan. 2013. Elements of Food Science. New India Publishing Agency,New Delhi ISBN: 979-93-81450-24-6.
- Vaclavik VA and Christian EW. 2014. Essentials of Food Science. 4th Edition,SpringerVerlag,New York.

Suggested Online Readings:

- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

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PROGRAMME: B.SC.	**YEAR: 2023**	**SEMESTER: 2nd**
PROGRAMME : HUMAN NUTRITION		**PROGRAMME : 1116**
COURSE CODE :HNSEC-02	**COURSE TITLE: FOOD SAFETY AND STANDARDS**	

COURSE OBJECTIVES:

- To provide both theoretical and practical exposure to the students on the subject of food safety including types of toxin and methods of removal of these in terms of human health.
- To approach the related topics ranging from types, causative factors, signs and symptoms of food toxicity, removal and potential containments.
- To induce sufficient knowledge regarding national and international food safety standards.

COURSE OUTCOMES: Successful completion of this course will enable the students to:

- Be an expert on the subject relating key learning's as food safety officer/ extension worker/ food inspector.
- Utilize learning in scientific Publications/ population education.

CREDITS: 4	**TYPE OF COURSE: SKILL ENHANCEMENT COURSE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I	**Introduction and Significance of Food Toxicology**
UNIT-I	**Xenobiotics Toxicologically relevant principles of the cell and molecular biology;** Dynamics and kinetics of xenobiotics; Environmental pollutants entering the food chain.
UNIT-II	**Introduction and significance of food toxicology;** Food poisoning – types, causative factors, signs and symptoms and preventive measures; Naturally occurring food toxins, their harmful effects and methods of removal.
BLOCK-II	**Food Safety Laws and Standards**
UNIT-III	**Microbial and chemical toxins Microbial toxins and food intoxication**: source of contamination, effects on health, preventive measures and methods of inactivation and destruction; **Chemical toxins** – Community Science: Food and Nutrition pesticides, insecticides, metallic and others and their residual effects, preventive measures and methods of removal.
UNIT-IV	**Food safety laws and standards Food packaging material:** Potential contaminants from food packaging material; Food safety laws and standards: FSSAI, FPO, ISI, Agmark, Codex Alimentarius, ISO mark for vegetarian and non-vegetarian foods, eco-friendly products and others in operation

Recommended Book Readings:

Concon JM. 2000. Food Toxicology- Principles and Concepts - Part A and B. Marcel-Dekker Inc. New York. • Helferich W and Winter CK. 2001. Food Toxicology. CRC Press, Boca Raton, Florida.
• Pussa T. 2013. Principles of Food Toxicology. CRC Press, Boca Raton, Florida.
• Timbrell J. 2001. Introduction to Toxicology. 3rd Edition, Informa, London.
• Vought JB and Henderson MK. 2000. Principles of Sampling and Sending Biological Materials for Toxicological Analysis - Biomarkers Practical Aspects. IARC publication, WHO, Geneva.

Suggested Online Readings:

• https://www.fssai.gov.in
• http://www.fda.gov/food/default.htm

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 2nd
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :AECHRD	COURSE TITLE:HUMAN RIGHTS AND DUTIES/ मानवाधिकार–समाजऔरविकास	

COURSE OBJECTIVES:

To strengthen respect for human rights and fundamental freedoms,
To value human dignity and develop individual self respect and respect for others
To develop attitudes and behaviors that will lead to respect for the rights of others
To promote respect, understanding and appreciation of diversity
To empower people towards more active citizenship
To ensure genuine mime gender equality and equal opportunities for women and men in all sphares
To promote democracy, development, Social Justice, Communal harmony, Solidarity and Friendship among people and nations
To further the activities of international understanding, tolerance and non-Violence

COURSE OUTCOMES:

Demonstrate good understanding of the provisions under the constitution of India dealing with Human Right. Ananlyse complex human rights problem and apply relevant provisions of human rights law in India to a hypothetical situations and theoretical knowledge.

CREDITS: 4	**TYPE OF COURSE: Ability Enhancement Compulsory Courses**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

खण्ड–1–	**मानवाधिकारको समझना**
इकाई–1	मानवाधिकारक्याऔरक्यों ?
इकाई–2	क्यामानवाधिकारसार्वभौमिकहै ?
इकाई–3	विएना घोषणापत्र औरकार्य योजना।
खण्ड–2–	**संयुक्तराष्ट्रऔरमानवाधिकार**
इकाई–4	संयुक्तराष्ट्रमानवाधिकार घोषणपत्र–इतिहास, महत्वऔरउद्देश्य। संयुक्तराष्ट्रमानवाधिकारक्रियान्वयनतंत्र।
इकाई–5	अन्तर्राष्ट्रीय प्रतिज्ञापत्र 1. नागरिकऔरराजनीतिकअधिकार। 2. आर्थिक, सामाजिकऔरसांस्कृतिकअधिकार।
इकाई–6	संयुक्तराष्ट्रमानवाधिकारक्रियान्वयनतंत्र।
खण्ड–3–	**भूमंडलीकरणऔरमानवाधिकार**
इकाई–7	विकास, लोकतंत्र औरमानवाधिकार।
इकाई–8	अन्तर्राष्ट्रीय संबंध, राज्य, संप्रभुताऔरमानवाधिकार।
इकाई–9	विश्व–व्यापारऔरमानवाधिकार।
खण्ड–4–	**मानवाधिकारके रूपमेंविकास का अधिकार**

इकाई–10	विकास का अधिकार।
इकाई–11	भोजन, स्वास्थ्य औरआवास का अधिकार।
इकाई–12	सूचना का अधिकार।
इकाई–13	शिक्षा का अधिकार।
खण्ड–5	**मानवाधिकारआंदोलन**
इकाई–14	विकासशीलदेशोंमेंगैर–सरकारीसंगठनों के आंदोलनऔरराजनीतिकसुधार।
इकाई–15	मानवाधिकारआंदोलनऔरगैर–सरकारीसंगठन।
इकाई–16	मानवाधिकारवादीगैर–सरकारीसंगठनऔर उनके कार्य।

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER:2nd
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE : AECHH	COURSE TITLE:HEALTH, HYGIENE AND SANITATION	

COURSE OBJECTIVES:

- Learn the various aspects of food safety.
- Understand about food laws and labelling.
- Understand the need for consumer education.

- **COURSE OUTCOMES:**Upon completion of this course, the student will be able to:
- Identify causes of and preventionProcedures for food-borne illness, intoxication, and infection.
- Demonstrate good personal hygiene and safe food handling procedures; describe food storageand refrigeration techniques; explain sanitation of dishes, equipment, and kitchens including cleaning material, garbage, and refuse.
- Discuss Occupational Safety and Health Administration (OSHA) requirements and
- EffectiveWorkplace safety programs in Food Service Industries.
- Nutrition educator
- Health educator
- Extension worker for situational analysis of prevailing public health nutritional problems for cultural adaptation strategies.
- Planner and executor of developmental schemes
- Applied researcher

CREDITS: 4	TYPE OF COURSE: ABILITY ENHANCEMENT COMPULSORY COURSES
MAXIMUM MARKS :100	MINIMUM MARKS : 36

BLOCK-I**Nutritional Problems and Nutritional Deficiencies**

UNIT-I	**Present scenario of nutritional problems:** Major nutritional problems of the state, nation and world; Nutrition intervention definition, importance, methods of nutrition intervention,monitoring and evaluation; E-surveillance.
UNIT-II	**Nutritional deficiencies and life style disorders:** Prevalence, etiology, biochemical and metabolic changes in protein energy malnutrition, vitamin A deficiency, iron deficiency anemia, iodine deficiency disorders, diabetes mellitus, cancer, hypertension and other life style disorders.
Block-II	**Sanitation Procedures and Importance of Personal Hygiene**
UNIT-III	**Sanitation Procedures:** Basic Principles of Hygiene and Sanitation, Personal hygiene and Environmental hygiene, Methods of Sanitation and Hygiene, Sterilization and disinfection using heat and chemicals, Waste product handling and control- Solid and liquid waste disposal, Control of infestation- Pest control Cleaning and sanitizing- need for efficient cleaning program, cleaning agents, equipment's, Methods to wash, rinse and sanitizing food contact surfaces. Importance and methods of pest control; Outlining methods of disposal of liquid, solid and gaseous waste.
UNIT-IV	**Importance of Personal hygiene of food handlers:** General principles of hygiene – personal and environmental hygiene, Hygienic practices in handling and serving foods,Planning and implementation of training NBBV programme for healthy person.

Recommended Book Readings:

- Mahtab, S, Bamji, Kamala Krishnasamy, Brahmam, G.N.V. (2012)

- Text Book of HumanNutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- Srilakshmi, B. (2013), Dietetics, New Age International (P) Ltd., New Delhi.
- SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.
- Longvah, T, Ananthan, R, Bhaskarachary, K, Venkaiah, K. (2017). Indian Food Composition Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
- Shakuntala Manay, Shadaksharaswamy. M (2013) Foods, Facts and Principles, New• Age International Pvt Ltd Publishers, 2nd Edition) Ltd., New Delhi. Swaminathan, M. (2012)
- Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.

Suggested Online Readings:

- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

THIRD SEMESTER

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 3rd
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-109	COURSE TITLE: DIET THERAPY	

COURSE OBJECTIVES:

- Understand the role of dietitian and to maintain good nutritional status, correct deficiencies or disease conditions of the patients.
- Gain knowledge on the principles of diet therapy and designing or formulating different
  therapeutic diets for various disease conditions
- Develop skill to plan and prepare therapeutic diets for prevention of disease conditions
- Diet therapy may include prescribing specialized dietary regimes or meal plans. As Entrepreneur.

COURSE OUTCOMES: Learners should be able to:

- Integrate knowledge of research principles and methods associated with nutrition and dietetics practice.
- Use effective and appropriate communication skills in providing information, advice andProfessional opinion to individuals, groups and communities.
- Collect, organize and assess data relating to the health and nutritional status of individuals,Groups and populations.
- Demonstrate initiative and judgment using a professional, ethical and entrepreneurialapproach advocating for excellence in nutrition and dietetics.
- Independently plan and execute a research project in regard to nutrition and dietetics practice.

CREDITS: 4	TYPE OF COURSE: CORE
MAXIMUM MARKS :100	MINIMUM MARKS : 36

BLOCK-I Concepts of Diet Therapy and Medical Nutrition Therapy in Obesity, Underweight and Diabetes Mellitus:

UNIT-I	**Concepts of Diet Therapy:** Growth and Scope of Dietetics Purposes and Principles of Therapeutic Diets Modifications of Normal Diets Classification of the Therapeutic Diets, Role of Dietitians Characteristics of Dieticians, Hospital Dietary Food Service, Diet Counseling, Team Approach to Nutritional Care, Principles of Food Prescription Indian Dietetic Association, Computer Assisted Instructions (CAI) Diet Planning using computers, Use of Technology in diet counseling.
UNIT-II	**Medical Nutrition Therapy in Obesity, Underweight and Diabetes Mellitus:** Etiology, Pathophysiology, Clinical symptoms, metabolic alterations, Assessment/Indicators, Lifestyle & Dietary guidelines for the following conditions Obesity (Bariatric Surgery: types, Management) Underweight Diabetes Mellitus (Acute and Chronic Complications of Diabetes Diet Modifications, Use of Food Exchange Lists, Insulin-Types and Use, Oral Hypoglycemic Agents, Carbohydrate counting, Glycemic Index, Glycemic Load)
BLOCK-II	**Medical Nutrition Therapy in Gastrointestinal Disorders and Diseases of the liver, Cardio Vascular System, Fever and Kidney:**

UNIT-III	**Medical Nutrition Therapy in Gastrointestinal Disorders and Diseases of the liver:** Etiology, Pathophysiology, Clinical Symptoms, Assessment/Indicators, Lifestyle & Dietary guidelines for the following conditions Diarrhea, Dysentery, Constipation and Peptic Ulcer Jaundice Hepatitis Fatty Liver Cirrhosis Hepatic Coma
UNIT-IV	**Medical Nutrition Therapy in Diseases of the Cardio Vascular System and Kidney Diseases:** Etiology, Pathophysiology, Clinical Symptoms, Lifestyle & Dietary guidelines for the following conditions: Atherosclerosis, Hyperlipidemia, Ischemic Heart Disease, Congestive Heart Failure, Bypass Surgery Hypertension (DASH Diets) Nephrotic Syndrome Nephrolithiasis Acute and Chronic Renal Failure Dialysis – Principles and Types Kidney Stones
UNIT-V	**Medical Nutrition Therapy for Fever:** Food Allergy and Cancer Febrile Conditions Acute and chronic infectious disease-Typhoid, Tuberculosis and HIV and AIDS a. Guidelines for management of tuberculosis and infectious diseases. Food Allergy - Definition, Causes, Science and Symptoms, Types of Allergy, Diagnosis, Dietary Modifications Gluten sensitivity and Lactose intolerance **Cancer:** Etiology, Metabolic alterations, Types of Cancer, Dietary Recommendation for Cancer Survivors. Nutritional therapy for Cancer

Suggested BookReadings:

- Srilakshmi, B. Dietetics ,New Age International P. Ltd., New Delhi, 2018. Dietary Guidelines of Indians – A Manual, National Institute of Nutrition, Hyderabad, 2015.
- Garg, M. Diet, Nutrition and Health, ABD Publishers, 2006.
- Krause, M.V. and Mahan, L.K. Food, Nutrition and Diet Therapy, 9th Ed., W.B. Saunders
- Company, Philadelphia, 2019. Maimun Nisha, Diet Planning for Diseases, Kalpaz Publishers, 2016.
- Dietary Guidelines of Indians – A Manual, National Institute of Nutrition, Hyderabad, 2011.
- Brown, J (2014).Nutrition now (7thed). Wadsworth, USA, ISBN- 13:978-1-133-93653-4, ISBN10:1-133-93653-9 Nelms M, Sucher K (2015).
- Nutrition Therapy and Pathophysiology. (3rd edition)Cengage Learning, USA. ISBN-13: 978-1305111967, ISBN-10: 130511196n, New Delhi

Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 3rd
PROGRAMME: HUMAN NUTRITION		PROGRAMME: 1116
COURSE CODE: UGHN-110	COURSE TITLE:FOOD ANALYSIS	

course objectives:

- to provide the students an opportunity to develop precision with the principles, techniques and application of different methods analysis for varied food and products.
- restructured and revised syllabi of post-graduate programmes.
- to equip the students with knowledge to ascertain quality of the tested food/ products.

COURSE OUTCOMES: Successful completion of this course will enable the studentsto:

- Utilize the methods and tools to cater the needs of food analysis.
- Guide the process of quality control.
- Act as trained food analyst.

CREDITS: 4	**TYPE OF COURSE:** CORE
MAXIMUM MARKS :100	**MINIMUM MARKS: 36**

BLOCK-I Sampling and Analytical Techniques:

UNIT-I	**Sampling Techniques:** Preparation of various standard solutions; Sample and sampling techniques; Introduction to standard analytical methods of FSSAI.
UNIT-II	**Analytical Techniques:** Principle, techniques and applications of colorimeter, spectrophotometer and atomic absorption spectrophotometer, gel filtration and ultra-centrifugation.

BLOCK-II **Photometric Methods and Electrophoresis, Chromatography Principle:**

UNIT-III	**Photometric Methods and Electrophoresis Principle:**Techniques and applications of fluorimetry, flame photometry and electrophoresis.
UNIT-IV	**Chromatography Principle**:Techniques and applications of paper, thin layer, gas liquid and highpressure liquid chromatography, introduction to animal assay.
Unit-V	Electromangetic radiation based analytical instrumentation
Unit-VI	Analytical balance, ph meter and refractometer

Recommended Book Readings:

- AOAC. 1995. Association of Official Analytical Chemists. Washington, DC. Gruenwedels DW and Whitakor JR. 1984. Food Analysis: Principles and Techniques. Vols. I-VIII. Marcel Dekker.
- AOAC International. 2016. AOAC Official Methods of Analysis. 20th Edition, Association of Official Analytical Chemists. Washington DC. Community Science: Food and Nutrition 135
- Dennis D Miller. 1998. Food Chemistry: A Laboratory Manual. John Wiley and Sons Indianapolis.
- Joslyn MA. 1970. Methods in Food Analysis: Physical, Chemical and Instrumental Methods of Analysis. Academic Press.
- Kalia M. 2002. Food Analysis and Quality Control. Kalyani Publishers, New Delhi.
- Neilsen SS. 2010. Food Analysis. 4th Ed., ISBN 978-1-4419-1478-1 Springer Science+ Business Media, LLC, USA.
- Neilsen SS. 2002. Introduction to Chemical Analysis of Foods. 1st Ed., J S Offset

Printers, Delhi.
Suggested Online Readings: • https://www.fssai.gov.in • http://www.fda.gov/food/default.htm • https://www.nutritionintl.org https://www.hsph.harvard.edu/nutritionsource • https://www.nutrition.org.uk • http://www.nutritioncare.org • https://www.ift.org • https://www.foodsciencematters • https://www.ifst.org
This course can be opted as an elective by the students of following subjects: NA
Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 3rd
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-111	COURSE TITLE: MATERNAL AND CHILD NUTRITION	

Course Objectives:

- To understand the physiology and of pregnancy and lactation and how these influence nutritional requirements will be able to learn the benefit of breast feeding.
- To understand the process of growth and development from birth until adulthood.
- To get familiar with the nutritional needs at different stages of growth.
- To be aware of the problems encountered in pregnancy and during breastfeeding and how to cope with these problems.

Course Outcome:

- CO1: Learners will be able to understand the physiology and of pregnancy and lactation and how these influence nutritional requirements will be able to learn the benefit of breast feeding.
- CO2: Learners will be able to be aware of the problems encountered in pregnancy and during breastfeeding and how to cope with these problems.
- CO3: Learners will be able to understand the process of growth and development from birth until adulthood.
- CO4: Learners will be able to get familiar with the nutritional needs at different stages of growth.

CREDITS: 4	**TYPE OF COURSE:** CORE
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-IImportance of Maternal Nutrition	
UNIT-I	Importance of Maternal Nutrition: Current Nutrition and Health Status of Women and Children in India.
UNIT-II	Importance of nutrition prior to and during pregnancy
sUNIT-III	Effect of under nutrition on mother-child.
BLOCK-II	Physiology and endocrinology of pregnancy andNutritional requirements during pregnancy
UNIT-IV	Physiology and endocrinology of pregnancy and embryonic and fatal growth and development.
UNIT-V	Nutritional requirements during pregnancy.
UNIT-VI	Adolescent Pregnancy
BLOCK-III	Pregnancy and AIDSand TB
UNIT-VII	Pregnancy and AIDS
UNIT-VIII	Pregnancy and TB
UNIT-IX	Intra-uterine growth retardation
BLOCK-IV	Complications of pregnancy,Congenital malformation
UNIT-X	Complications of pregnancy and management and importance of antenatal care.
UNIT-XI	Congenital malformation, fetal alcohol syndrome and gestational diabetes mellitus.
UNIT-XII	Growth and development during infancy, childhood and adolescence.
BLOCK-V	Feeding of infants,Malnutrition in mothers andPolicies and programmes

UNIT-XIII	Feeding of infants and children and dietary management
UNIT-XVI	Malnutrition in mothers and children: etiology and management.
UNIT-XV	Policies and programmes for promoting maternal and child nutrition and health.
This course can be opted as an elective by the students of following subjects: NA	
Suggested equivalent online courses (MOOCs) for credit transfer :NA	

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 3rd
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :HNSEC-03	COURSE TITLE:COMPUTER APPLICATION AND STATISTICS	

COURSE OBJECTIVES:

- **To understand the computer Application in daily life.**
- **To understand about statistical measures Binomial distribution and other application of computers.**

COURSE OUTCOMES:

- **Learner will be able to understand the computer Application in daily life.**
- **Learner will be able to understand about statistical measures Binomial distribution and other application of computers.**

CREDITS: 4	**TYPE OF COURSE: SKILL ENHANCEMENT COURSE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

UNIT-I	**Conceptual understanding of statistical measures:**Classification and tabulation of data. **Measurement of central tendency, measures of variation.**
UNIT-II	**Frequency distribution:**Histogram, Frequency, Polygons, Ogive**.**
UNIT-III	**Binomial distribution**
UNIT-IV	**Normal distribution –** Use of normal probability tables
UNIT-V	**Parametric and non-parametric tests.**
UNIT-VI	**Testing of hypothesis.** Type I and Type II errors. Levels of significance
UNIT-VII	**Chi-square test.** Goodness of fit. Independence of attributes 2 x 2 and r x c contingency tables.
UNIT-VIII	**Application of student 't' test for small samples.** Difference in proportion for means and difference in means.
UNIT-IX	**Correlation, coefficient of correlation, rank correlation**
UNIT-X	**Regression and prediction**
UNIT-XI	**Analysis of variance –** one way and two-way classification.
UNIT-XII	**Experimental Designs** - Completely randomized design - Randomized block design - Latin square design

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 3rd
PROGRAMME : HUMAN NUTRITION 1116		PROGRAMME :
COURSE CODE :AECEA	COURSE TITLE:ENVIRONMENT AWARENESS	

COURSE OBJECTIVES:

- **To aware about the environment**

COURSE OUTCOMES:

- CO1: **Learners will be able to aware about the environment.**
- CO2: **Learners will be able to understand the effect of environment on human health.**
- CO3: **Learners will be able to understand every aspect of the environmental science.**

CREDITS: 4	**TYPE OF COURSE:ABILITY ENHANCEMENT COMPULSORY COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS: 36**

BLOCK-1

खण्ड– 01 : पर्यावरणऔरपारिस्थितिकी

इकाई–01 : पर्यावरण–अवधारणा, संघटन एवंप्रकार

इकाई– 02 : पारिस्थितिकी–अवधारणा, प्रकार एवंसिद्धान्त

इकाई– 03 : पारिस्थितिकीतंत्र –अवधारणा, संघटन, कार्यशीलता एवंस्थिरता

इकाई– 04 : विश्व के प्रमुख पारिस्थितिकतंत्र

खण्ड– 02 : प्राकृतिकसंसाधनः उपयोग एवंसंरक्षण

इकाई– 01 : प्राकृतिकसंसाधन–अवधारणा, वर्गीकरण एवंसंरक्षण के सिद्धान्त

इकाई– 02 : जैवसंसाधन–वनसंसाधन, जैवविविधता, राष्ट्रीय उद्यान

इकाई– 03 : जल संसाधन–जलचक्र, उपलब्धता, उपयोग एवंसंरक्षण

इकाई– 04 : मृदासंसाधन–विकासप्रक्रिया, उपयोग एवंसंरक्षण

इकाई– 05 : ऊर्जासंसाधन–उत्पादन, उपयोग एवंसंरक्षण

इकाई– 06 : खनिजसंसाधन–संमाव्यनिधि, उत्पादन, उपयोग एवंसंरक्षण

खण्ड– 03 : प्राकृतिकआपदा, पर्यावरणप्रदूषण एवंप्रबन्धन

इकाई– 01 : प्राकृतिकआपदा–अवधारणा एवंप्रकार

इकाई– 02 : प्रमुख प्राकृतिकआपदायें

इकाई– 03 : जल प्रदूषण एवंप्रबन्धन

इकाई– 04 : वायुप्रदूषण एवंप्रबन्धन

इकाई– 05 : ठोसअपशिष्ट–प्रदूषण एवंप्रबन्धन

खण्ड– 04 : जनसंख्या एवंपर्यावरण

इकाई– 01 :विश्वजनसंख्या वृद्धि एवंवितरण

इकाई– 02 : भारत मेंजनसंख्या वृद्धि एवंसामाजिक–आर्थिकसंरचना

इकाई– 03 :जनसंख्या वृद्धि एवं घनत्व के पर्यावरणीय प्रभाव

इकाई– 04 :नगरीय जनसंख्या, पर्यावरण एवंस्वास्थ्य

इकाई– 05 :जन जीवन परपर्यावरणीय दुर्घटनाओं के प्रभाव

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 3rd
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :AESWM	COURSE TITLE:SOLID WASTE MANAGEMENT	

COURSE OBJECTIVES:

- To understand the disposal of solid waste in society
- To understand the deferent methods of solid waste disposal

COURSE OUTCOMES:

- Co1: Learners will be able to understand the disposal of solid waste in society.
- Co2: Learners will be able to understand the deferent methods of solid waste disposal.
- Co3: Learners will be able to understand the importance of solid waste management.

CREDITS: 4	**TYPE OF COURSE: ABILITY ENHANCEMENT COMPULSORY COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

SOLID WASTE MANAGEMENT (Elective Foundation Course) (SWM)

BLOCK 1:	**Sources and Types of Municipal Solid Waste:**
Unit 1:	Introduction to Municipal Solid Waste Management
Unit 2:	Composition of solid waste
Unit 3:	Principles of solid waste management
BLOCK 2:	**Measurement of Solid Waste and public health**
Unit 4:	Quantities and methods to measure solid waste quantities
Unit 5:	Solid waste and public health
Unit 6:	Factors affecting solid waste
BLOCK 3:	**Collection, Handling, Segregation, Storage and processing of Solid Waste**
Unit 7:	Collection of solid waste
Unit 8:	Waste handling and segregation
Unit 9:	Processing of Solid Waste
BLOCK 4:	**Disposal of Municipal Solid Waste and Hazardous Solid Waste**
Unit 10:	Combustion and energy recovery of solid waste
Unit 11:	Biochemical processes
Unit 12:	Hazardous solid waste

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

FORTH SEMESTER

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 4th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-113	COURSE TITLE:NUTRITIONAL ASSESSMENT AND SURVEILLANCE	

COURSE OBJECTIVES:

- Understand the concept of nutritional status and its relationship to health.
- Know the aims and objectives of assessing the nutritional status of an individual and community.
- Know the methods at used for assessment of nutritional status.
- Know the extent and types of malnutrition prevalent in the country and region.
- Identify the factors responsible for the malnutrition.

COURSE OUTCOMES:

- CO1: Learners will be able to understand the concept of nutritional status and its relationship to health.
- CO2: Learners will be able to know the aims and objectives of assessing the nutritional status of an individual and the community.
- CO3: Learners will be able to know the methods used for assessment of nutritional status.
- CO4: Learners will be able to know the extent and types of malnutrition prevalent in the community and region.

CREDITS: 4	**TYPE OF COURSE: CORE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I **Direct Nutritional Assessment, Diet Survey**	
UNIT-I	**Direct Nutritional Assessment of Human Groups** Clinical science, nutritional anthropometry, biochemical test, bio physical methods.
UNIT-II	**Diet Survey:** Need and importance, methods of dietary survey interpretation concept of consume consumption unit intra and inter individual distribution in family education of diet with respect to RDA concept of family food security .
UNIT-III	**Clinical Science:** importance and need, identifying of PEM, Vitamin A deficiency and iodine deficiency, interpretation of descriptive list of clinical science.
BLOCK-IINutritional Anthropometry, Rapid Assessment Procedures	
UNIT-IV	**Nutritional Anthropometry**: need and importance, standards and reference, techniques of measuring height weight head chest and arm circumference interpretation of these measurements and use of growth charts.
UNIT-V	**Rapid Assessment Procedures:** need an importance, technique interpretation.

UNIT-VI	**Secondary Sources Of Community Health Data:**sources of relevant vital statistics, importance of Infant, child and maternal mortality rates, immunology of nutritionally related diseases.
BLOCK-IIISociological Factors; Etiology and Prevention of Malnutrition and Surveillance Systems:	
UNIT-VII	**Sociological Factors; Etiology and Prevention of Malnutrition:** Food production and availability, cultural Influences, Socio economic factors food consumptions conditioning infections Medical and educational services psychosocial emergencies / Disaster conditions example; famine, floods, war.
UNIT-VIII:	**Surveillance Systems:**International, national, regional, and community

Recommended Book Readings:

- Mahtab, S, Bamji, Kamala Krishnasamy, Brahmam, G.N.V. (2012)
- Text Book of HumanNutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- Srilakshmi, B. (2013), Dietetics, New Age International (P) Ltd., New Delhi.
- SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.
- Longvah, T, Ananthan, R, Bhaskarachary, K, Venkaiah, K. (2017). Indian Food Composition Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
- Shakuntala Manay, Shadaksharaswamy. M (2013) Foods, Facts and Principles, New• Age International Pvt Ltd Publishers, 2nd Edition) Ltd., New Delhi. Swaminathan, M. (2012)
- Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.

Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 4th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-114	COURSE TITLE:NUTRITION AND PHYSICAL FITNESS	

COURSE OBJECTIVES:

- To provide both theory and practical exposure to understand the concept of physical fitness.
- To incorporate recent techniques of body composition and energy metabolism to ascertain the nutritional stature.
- To equip the students with the knowledge and capacity to identify, evaluate and evolve ways in addressing various aspects of physical fitness.

COURSE OUTCOMES: On completion of this course, the students will be able to handle responsibilities as:

- Physical fitness educator/ Adviser
- Utilize methods and techniques for vulnerability assessment as per need of the situation
- Experts in Healthcare Team and fitness centers

CREDITS: 4	TYPE OF COURSE: CORE
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Understanding Fitness and Importance of Nutrition:	
UNIT-I	**Understanding Fitness:** Definition of fitness, health and related terms, Assessment of fitness, approaches for keeping fit. Techniques to assess physical fitness; Body composition in different physiological conditions and factors affecting it.; Methods of measuring body composition.
UNIT-II	**Importance of Nutrition:** Role of nutrition in fitness• Nutritional guidelines for health and fitness, Nutritional supplements, Energy balance Energy metabolism; Factors influencing energy metabolism and physical fitness; Techniques to measure energy expenditure and energy intake.
BLOCK-II Sports nutrition and Weight Management:	
UNIT-III	**Sports nutrition:** Requirement of nutrients for specific sports events; Exercise physiology and biochemistry; Nutrition support before, during and after sports event; Water and electrolyte requirement during exercise and their role in performance;
UNIT-IV	**Nutrition and Ageing:**Role of nutraceuticals in fitness; Ageing theories; Physiology, mechanism and role of nutrients in arresting ageing process.
UNIT-V	**Weight Management:** Assessment, etiology, health complications of overweight and obesity• Diet and exercise for weight management• Fad diets• Principles of planning weight reducing diets•

Recommended Book Readings:

- Benardot D. 2005. Advanced Sports Nutrition. 2nd Edition, Human Kinetics Publishers, Champaign, IL. • Baumgartner R. 2006. Body Composition in Healthy Aging. Annals of the New York Academy of Sciences.
- FAO. 2004. Human Energy Requirements. -Report of a Joint FAO/WHO/UNU Expert Consultation. Technical Report Series 1. Food and Agriculture Organization, Geneva.
- Geetanjali B and Subhadra M. 2018. Nutritional Guidelines for Sportspersons. Jaypee

Health Books Publishers.
- Geissler C and Powers H. 2009. Fundamentals of Human Nutrition. Churchill Livingstone, London.
- Ross AC, Caballero B, Cousins RJ, Tucker KL and Ziegler TR. 2012. Modern Nutrition in Health and Disease. Eleventh Edition, LWW, Philadelphia.
- Srilakshmi B, Suganthi V and Kalaivani C Ashok. 2017. Exercise Physiology Fitness and Sports Nutrition. New Age International Publishers.

Suggested Online Readings:

- https://www.who.int
- https://www.hsph.harvard.edu/nutritionsource
- http://www.nutritioncare.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 4th
PROGRAMME : HUMAN NUTRITION PROGRAMME : 1116		
COURSE CODE :UGHN-115	COURSE TITLE:FOOD PROCESSING TECHNOLOGY	

COURSE OBJECTIVES:

- To give exposure of the subject, with the newer techniques in food processing procedures ranging from preliminary steps to the packaging aspects of different foodstuff for safe consumption and business.
- To equip students to identify and application of processing methods suitable to meet the purpose of the consumer.

COURSE OUTCOMES:

- Learning Outcome This course will help students toutilize the scientific knowledge to become food processing entrepreneur.
- Utilize the acquired knowledge for being an expert in any processing unit.
- Assist in ascertaining quality control of a consumed food in any given situation.

CREDITS: 4	**TYPE OF COURSE: CORE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-1	**Food processing techniques, Processing technologies for plant foods**
UNIT-I	**Food processing techniques:** Principles underlying food processing operations including thermal, radiation, refrigeration freezing and dehydration; Effect of processing on physiochemical characteristics; Principles underlying pressure modified processing (high hydrostatic pressure, hyperbaric processing, vacuum cooling, hypobaric storage).
UNIT-II	**Processing technologies for plant foods:** Processing technology for preservation and production of variety food products during storage, handling and processing of cereals/millets and legumes, oilseeds, fruits and vegetables; Food preservation by Hurdle technology and canning technology.
BLOCK-II	**Processing technologies for animal foods, Quality control in food processing**
UNIT-III	**Processing technologies for animal foods:** Processing technology for milk and milk products, egg, meat, poultry and fish, convenience foods and processed foods; Technologies underlying mutual supplementation, enrichment and fortification, fermentation, malting and germination; Food additives commonly used in food industries for color, flavor and as preservatives; Nanomaterials as food additives.
UNIT-IV	**Quality control in food processing:** Quality control in food industry - raw materials and finished products; Waste management and sanitation in food industries; Packaging - self-cooling self-heating packaging, micro packaging, antimicrobial packaging and water-soluble packaging.
Recommended Book Readings:	

- Brennan JG. 2006. Food Processing Handbook. Wiley-VCH
- Clark S, Jung S and Lamsal B. 2014. Food Processing - Principles and Applications. 2nd Edition, Wiley-Blackwell Publishing Company, Boston.
- Fellows PJ. 2000. Food Processing Technology. Woodhead Publishing Ltd.
- Fellows PJ. 2017. Food Processing Technology, Principles and Practice. 4th Edition, Woodhead Publishing Ltd. Cambridge.
- Hartel R W and Heldman D. 2012. Principles of Food Processing. Aspen Publishers Inc. New York.
- Owens G. 2001. Cereals Processing Technology. Woodhead Publishing Ltd.
- Sivshankar B. 2002. Food Processing and Preservation. Prentice-Hall of India Pvt. Ltd. Delhi.
- Subbalakshmi. 2001. Food Processing and Preservation. New Age International Publishers, New Delhi.
- Vaclavik V. 2018. Dimensions of Food. CRC Press.

Suggested Online Readings:

- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 4th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :HNSEC-04	COURSE TITLE:TECHNIQUES OF FOOD PRESERVATION	

COURSE OBJECTIVES:

- To learn the principles behind the methods of preservations.
- To understand the stages of cookery and chemical characteristics in the preservation of fruits and vegetables.
- Able to formulate preserved food products.
- Acquire skills to preserve different types of food items based on their perishability.

COURSE OUTCOMES:

- Know the principles of preservation behind the methods of preservation
- Understand the stages of sugar cookery, quality of pectin and acidity in the development of preserved food products
- Acquire skills to formulate food-based products
- Explore the principles of preservation in fruits and vegetables-based products
- Skills to prepare cereals and pulse based preserved products and develop new products with retention of quality.

CREDITS: 4	**TYPE OF COURSE: SKILL ENHANCEMENT COURSE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Concept of Food Preservation and Preparation of Dehydrated Products:

UNIT-I	**Concept of Food Preservation :** Importance of Food Preservation, Types of Food spoilage by Micro organisms and by Enzymes Basic Principles of Food Preservation Food preservatives- Use of Salt, Acid, Sugar, natural food preservatives and artificial preservatives Starting a food preserving unit Product Promotion strategies and marketing skills .
UNIT-II	**Preparation of Dehydrated Products:** Methods of drying &dehydration , different types of driers , freeze drying-lyophilisation, packing & storage Drying methods for theselected products - Rice, Sago, Wheat, Maida, Rice flakes, black gram dhal, green gram dhal, Horse gram dhal Roots and Tubers General tips with drying foods Preparation of salted, dehydrated, preserves (Traditional Indian varieties of chips, Papads, Khakharasetc and Masala Powders, onion, garlic, ginger powder etc). **Hands on experience :**Dryingof vegetables- peas, potato, carrot, French beans, Reconstitution ofdried vegetables, Drying & preparation of powders-garlic, ginger, spices mix etc
BLOCK-II Preservation by Using Sugar, Chemicals, Saltsand Advanced Preservation	
UNIT-III	**Preservation by Using Sugar :** Role of Pectin in Preserved foods Stages in Sugar Cookery Sugar Concentrates – Principles of Gel Formation Hands on Experience: Preparation of Jam, Jelly, Marmalades, Sauce and Squash Preserves, Candied, Glazed, Crystallized Fruits, Toffee Evaluation of pH, Acidity and pectin quality Visit to Fruits and Vegetable processing industry.
UNIT-IV	**Preservation by Using Chemicals and Salts and Fermentation :**

	Preparation and Preservation of Fruit Juices, RTS Pickling – Principles Involved and Types of Pickles Chemical Preservatives – Definition, Role of Preservation Permitted Preservatives, FSSAI guidelines Foods fermented by Yeasts Foods fermented by Bacteria Common Fermented Foods, Wine and Cheese Making Hands on experience: Pickle making Visit to Commercial Pickle Manufacturing Food Industry and Wine industry
UNIT-V	**Preservation by Advanced Preservation Technology:** Meaning and needs of freezing foods Types of Freezing and managing freezers Guidelines for types of frozen foods-Fruits, Vegetables, fish, meat and poultry Smoking foods Pasteurization and Sterilization Food Irradiation Vacuum Packing Canning and Bottling Food Packaging Materials for preserved food products **Hands on experience:** Blanching of fruits & Vegetables Visit to Food Industries

Recommended Book Readings:

- Mahtab, S, Bamji, Kamala Krishnasamy, Brahmam, G.N.V. (2012)
- Text Book of HumanNutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- Srilakshmi, B. (2013), Dietetics, New Age International (P) Ltd., New Delhi.
- SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.
- Longvah, T, Ananthan, R, Bhaskarachary, K, Venkaiah, K. (2017). Indian Food Composition Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
- Shakuntala Manay, Shadaksharaswamy. M (2013) Foods, Facts and Principles, New• Age International Pvt Ltd Publishers, 2nd Edition) Ltd., New Delhi. Swaminathan, M. (2012)
- Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.

Suggested Online Course:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

Equivalent Other Programmes:

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 4TH
PROGRAMME : HUMAN NUTRITION		**PROGRAMME : 1116**
COURSE CODE : AECNC	**COURSE TITLE:NUTRITION FOR COMMUNITY**	

COURSE OBJECTIVES:

- To know the basics of public health nutrition.
- To understand the need of prioritizing nutrition issues.
- To assess the nutritional and Health Status of an individual and the community.
- To learn nutritional programmes and policies to overcome malnutrition.
- To understand various national and International nutritional organizations for combating malnutrition.
- To apply ICT in the formulation of community nutrition education programme.

COURSE OUTCOMES:

- Finally, the concepts and knowledge required for the delivery of community nutrition services will be applied to program planning, intervention and program evaluation.
- Gaining knowledge on nutritional programmes and policies overcoming malnutrition.
- Understanding the national, international and voluntary nutritional organizations to combat malnutrition.
- Able to organize community nutrition education programme with the application of computers.
- Apply immunological intervention programmes to overcome epidemic of communicable.

CREDITS: 4	**TYPE OF COURSE: ABILITY ENHANCEMENT COMPULSORY COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Introduction to Public Health Nutrition and Nutritional Assessment

UNIT-I	**Introduction to Public Health Nutrition:** Meaning and Scope of Public Health Nutrition, Roles and responsibilities of public health nutritionists ,Definitions of optimum health, malnutrition (under nutrition, overweight, obesity, micronutrient deficiency),nutritional status, nutrition intervention, food and nutrient supplements, , nutrition education, morbidity, mortality rates Nutrition – A Global Developmental Priority Importance of nutrition throughout the life cycle dual burden of malnutrition Sustainable Development Goals (SDGs), Goals require good nutrition to be met Ecology Consequences and of Malnutrition, Strategies To Overcome Malnutrition Relation of nutrition to national development Nutrition and food security.
UNIT-II	**Nutritional assessment Introduction:** Definition of Nutritional Status, Instruments, Standard of Reference, Age Assessment, Measurement Techniques, Weight, Linear Measurement/Height, Circumferences, Soft Tissue Subcutaneous Fat, Objective and Classification of nutritional assessment **Methods Overview of nutritional status assessment methods:** Direct Nutritional Assessment parameters - (anthropometry, clinical signs and symptoms, dietary assessment and biochemical parameters); ecological parameters – environment, Food prices, and indirect parameters

	– SES, Mortality and Morbidity rates, Anthropometry measurementsTechniques commonly used in public health (weight for age, weight for height, height for age & BMI for age), Comparison of indices with reference. **Biochemical Estimation:** Name of assessment of parameters, Reference value/Desirable Level of nutrients and their metabolites in body tissues Lipids& Lipoproteins (TG. LDL and HDL cholesterol and their ratios) Carbohydrates (blood and urinary glucose) Protein (serumprotein, albumin, NEAA/EAA ratio, hydroxyproline index, urea/creatinine ratio, etc.) Iron (Hb, HcT, serum iron, transferrin, ferritin) Vitamin A (serum retinol, carotene) Vitamin D (serum alkaline phosphatase, calcium and phosphorous) B-complex vitamins, including Folic acid & Vitamin B12 (urinary excretion) Vitamin C (serum ascorbic acid, whole blood ascorbic acid) Iodine (T3, T4, urinary excretion) Sodium, potassium and chloride Fluoride TB Test, HIV Test CD4 counts Clinical Examination of common nutritional deficiencies Specific nutrient Deficiency signs & symptoms (Vitamin A, Iron, Iodine, Zinc U, B complex vitamins etc.) Grouping of Signs. **Dietary Survey and Types of Nutritional Survey Dietary intakes methods and understanding their usage and limitations in different field situations:** 24-hour diet recall methods; Food frequency method; Weighed food inventory; food diaries and food composition methods Rapid assessment methods for dietary intake Dietary Diversity Score for Household, Individual, women and children Indirect Nutritional Assessment parameters Vital Statistics, Age Specific Mortality Rate, Morbidity and Cause of Specific Mortality.
BLOCK-II Communication Concepts and National, International and Voluntary Organizations to Combat Malnutrition:	
UNIT-III	**Social & Behavior Change Communication Concepts:** components and process of communication for nutrition health promotion Definitions of Formal – non-formal communication, Participatory communication Components of BCC(Sender, Message, Channel, Receiver) Various types of communication – interpersonal, mass media, visual, verbal/ non-verbal. Methods of education when to teach, whom to teach Use of computers to impart nutrition education Organization of Nutrition education programmes.
UNIT-IV	**National, International and Voluntary Organizations to Combat Malnutrition:** Role of Nutrition in Achieving Global Targets, Optimal Infant and Young Child Feeding: Significance of the first 1000 days of life • Improving maternal, infant and young child nutrition – WHO Global Targets 2025 • Nutrition Intervention programmes in India – • Integrated Child Development Services (ICDS): ICDS Mission Mode, ICDS mission in • various states Role of AWW; Supplementary Nutrition, Bal bhog, Sakhibhog, Shishubhog • Mid-Day Meal (MDM) program • Fortification program **National Programs to Combat Micronutrient Malnutrition Iron:** National Nutritional Anemia Control Program, Nutritional Program for Control of Anemia among Adolescent Girls, National Iron Plus Initiative (NIPI) Vitamin A: Vitamin A Prophylaxis Program (VAPP) • Iodine: National Iodine Deficiency Disorders Control Program (NIDDCP), Universal Salt • Iodization (USI), Double Fortified Salt (DFS) Diarrhea Control Program: Role of Zinc, ORS and National Deworming Campaign

	• Fluorosis Control Program • Organizations Working towards Meeting Global Nutrition Targets National organization – ICAR, ICMR, CSWB, SSWB, NNMB, NIN, CFTRI, DFRL ,• NIPCCD and NFI, Save the Children, Tata Trusts International Organizations - World Bank, World Health Organization (WHO), United • Nations International Children's Emergency Fund (UNICEF), World Food Programme (WFP), Bill and Melinda Gates Foundation Voluntary organizations – Global Alliance for Improved Nutrition(GAIN) Micronutrient • Initiatives, CARE, CRS, AFPRO, IDA; World Alliance for Breastfeeding Action (WABA)
UNIT-V	**Epidemiology of Communicable Diseases:**Definition, causes, signs and symptoms, treatment and prevention of communicable diseases, • Respiratory infections and intestinal infections, Other infections- dengue, Flu • Types of immunity- active, passive and herd-group protection • Immunization agents- vaccines, immunoglobulin • Immunization schedules - National and WHO Expanded Programme on immunizationUniversal Passive, Combined, Chemoprophylaxis

Recommended Book Readings:

- Field guide to designing communication strategy, WHO publication-2007 Communication for Development (C4D) Capability Development Framework,UNICEF and 3D Change, 2009
- Health education: theoretical concepts, effective strategies and core competencies: a foundation document to guide capacity development of health educators/World Health Organization. Regional Office for the Eastern Mediterranean, 2012
- Park A. (2007), Park's Textbook of Preventive and Social Medicine XIX Edition M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur, 428 001(India)
- Bamji M.S, Prahlad Rao N, Reddy V (2004). Textbook of Human Nutrition II Edition, Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi Bhatt D.P (2008), Health Education, Khel Sahitya Kendra, New Delhi.
- Gibney MJ, Margetts BM, Kearney JM, Arab L (2004) Public Health Nutrition Blackwell Publishing Co. UK Swaminathan M (2007), Essentials of Food and Nutrition.
- An Advanced TextbookVol.I, The Bangalore Printing and Publishing Co. Ltd, Bangalore UNICEF.

Suggested Online Readings:

- https://www.unicef.org/ WHO.http://www.who.int/
- National Guidelines on Infant and Young Child Feeding. wcd.nic.in
- WHO Non-communicable diseases and risk factors.
- http://www.who.int/ncds/en/
- National Nutrition Mission – ICDS. icds-wcd.nic.in
- Ministry of Health & Family Welfare, www.mohfw.nic.in

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 4th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :AECDM	COURSE TITLE:DISASTER MANAGEMENT	

COURSE OBJECTIVES:

- To understand the meaning of disaster management
- To understand the managerial skills during any disaster

COURSE OUTCOMES:

- CO1: Learners will be able to understand the meaning of disaster management.
- CO2: Learners will be able to understand the managerial skills during any disaster.
- CO3: Learners will be able to understand the steps and ideas to safe from any disaster.

CREDITS: 4	**TYPE OF COURSE: Ability Enhancement Compulsory Courses**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

खण्ड 01 : – महत्त्व एवं कारकों की समझ	
इकाई –1	आपदाः एक परिचय
इकाई –2	आपदा विश्व और भारतीय सन्दर्भ में
इकाई –3	आपदाः सरकारी तथा गैर सरकारी संगठनों की भूमिका
इकाई –4	अन्तर्राष्ट्रीय अभिकरणों की भूमिका
खण्ड 02 आपदा का वर्गीकरण	
इकाई –05	भूकम्प, बाढ़ एवं जल निकासी
इकाई –06	चक्रवात, सूखा और अकाल
इकाई –07	भूस्खलन, हिमस्खलन, आग और जंगल की आग
इकाई –08	औद्योगिक और प्रौद्योगिकीय आपदा और महामारी
खण्ड 03 आपदा तैयारी के आधारभूत तथ्य	
इकाई –09	नियोजन
इकाई –10	संचार
इकाई – 11	नेतृत्व एवं संयोजन
इकाई –12	भण्डारण एवं सम्भरण
खण्ड 04 आपदा प्रबन्धन एवं जागरुकता	
इकाई –13	मानव व्यवहार एवं अनुक्रिया व्यक्तिगत सामुदायिक संस्थागत
इकाई –14	सामुदायिक भागीदारी एवं जागरूकता
इकाई –15	जन जागरूकता कार्यक्रम
इकाई –16	सूचना संगठन एवं प्रसार

FIFTH SEMESTER

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 5th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE : HNSEC-05	COURSE TITLE:NUTRITIONAL CHALLENGES IN LIFE CYCLE	

COURSE OBJECTIVES:

- To give an exposure to the students with an in-depth basic knowledge regarding nutritional challenges of vulnerable groups during various stages of life cycle
- To approach the areas from various angles like nutritional needs of fetus, mothers (expectant and lactating), adolescents, adults and geriatrics in terms of cognitive learning abilities and to remain healthy and productive
- To equip students to identify, evaluate and evolve management techniques to address nutritional challenge.

COURSE OUTCOMES: Learning Outcome Successful completion of this course will enable the students to-

- Appreciate the scientific understanding of mitigating nutritional challenges and relating key learning as Professional expert in the area.
- Utilize methods and hand tools for vulnerability assessment and designing adaptation strategies.
- Utilize knowledge in scientific publication/ population education.
- Be an expert in community health and R&D projects.

CREDITS: 4	**TYPE OF COURSE: SKILL ENHANCEMENT COURSE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-1	**Importance of Maternal Nutrition and Psycho-Physiology of Lactation:**
UNIT-I	**Importance of Maternal Nutrition:** Nutritional needs during first 1000 days; Influence of maternal nutritional status on outcome of pregnancy: birth weight of infant and lactation performance
UNIT-II	**Human Milk Psycho-Physiology of Lactation:** Milk synthesis and secretion; Maternal needs during lactation; Composition of colostrum and mature human milk; Milk of mothers of preterm babies; Milk of animal and formula feeds; Non-nutritional factors of human milk - immunological factors, enzymes and hormones; Human milk banking.
BLOCK-II	**Nutrition During Childhood and Geriatric Nutrition:**
UNIT-III	**Nutrition During Childhood:** adolescence and adulthood Nutritional needs of the children and adolescents; Common childhood ailments and dietary considerations; Growth spurt and nutrition; Adolescent fads influencing nutrition, food preferences and nutritional problems; Nutritional requirements in adulthood; Malnutrition, mental development, learning abilities and behavior.
UNIT-IV	**Geriatric Nutrition Overview of Ageing Process:** Nutritional variables related to the ageing process; Physiology of aging; Biological markers of aging; Sociology of aging; Nutritional requirements and deficiencies in elderly; Medications and psychiatric problems in elderly; Immune

	pathological diseases and aging; Parkinson and Alzheimer syndrome; Care of the elderly; Care-givers and community services.

Suggested BookReading :

- Bales CW, Ritchie CS. 2013. Handbook of Clinical Nutrition and Aging. 2nd Edition, Springer Science & Business Media, Humana Press Inc. New York.
- Cataldo CB, De Brayae LK and Whitney EN. 2012. Nutrition and Diet Therapy. 6th Edn., Wadsworth/Thomson Learning Inc.
- Chernoff R. 2003. Geriatric Nutrition: The Health Professional's Handbook. 2nd Edition, Jones & Bartlett Learning, Burlington, Massachusetts.
- Kleinman RE. 2008. Pediatric Nutrition Handbook. 6th Edition, American Academy of Pediatrics Committee on Nutrition.
- Sachdev HPS and Choudhury P. 2004. Nutrition in Children - Developing Country Concerns. B I Publications.
- Schlenker E and Gilbert JA. 2014. Williams' Essentials of Nutrition and Diet Therapy. 11th Edition, e- book.
- Sharbaugh C and Brown JE. 2013. Nutrition Through the Life Cycle. 5th Edition, Wadsworth Co Inc. Belmont, CA.
- Srilakshmi B. 2019. Dietetics. 8th Edition, New Age International Publisher.
- Whitney E, DeBruyne LK, Pinna K and Rolfes SR. 2011. Nutrition for Health and Health Care. 4th Edition. Restructured and Revised Syllabi of Post-graduate Programmes Vol. 6 150
- World Health Organization. 2005. WHO Library Cataloguing-in-Publication Data. Nutrition in Adolescence –Issues and Challenges for the Health Sector. WHO, Geneva.

Suggested Online Readings:

- https://www.who.int
- http://www.nutritionlink.org
- https://www.icmr.nic.i

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 5th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE : UGHN-116	COURSE TITLE:FOOD SAFETY AND QUALITY CONTROL	

COURSE OBJECTIVES: The course will enable students to-

- ❖ Learn the various aspects of food safety.
- ❖ Understand about food laws and labelling.
- ❖ Understand the need for consumer education.
- ❖ Know the importance of quality and the importance of quality assurance in food industry.
- ❖ Know the various tests and standards for quality assessment and food safety.
- ❖ Know the various tests used in detect food in adulterants.
- ❖ Be familiar with the fundamentals that should be considered for successful quality control program.

COURSE OUTCOMES: Upon completion of this course, the student will be able to:

- ❖ Identify causes of and prevention procedures for food-borne illness, intoxication, and infection.
- ❖ Demonstrate good personal hygiene and safe food handling procedures; describe food storage and refrigeration techniques; explain sanitation of dishes, equipment, and kitchens including cleaning material, garbage, and refuse.
- ❖ Discuss Occupational Safety and Health Administration (OSHA) requirements and effective workplace safety programs in Food Service Industries.

CREDITS: 4	**TYPE OF COURSE: DISCIPLINE SPECIFIC CORE COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Introduction to quality assurance and Quality assurance programme:	
Unit:I	**Introduction to quality assurance and food safety assurance.** Current concepts of quality control.
Unit :II	**Quality assurance programme**: Quality plan, documentation of records, product standards Product and purchase specifications, process control and HACCP, hygiene and housekeeping. Corrective action, quality and programme and total quality process.
BLOCK-II	**Quality Costs and Product Evaluation:**
Unit:III	**Quality Costs:** Measurement and Analysis.
Unit : IV	**Product Evaluation:** - Sampling for product evaluation and line control. - Statistical quality and process control - Specifications and food standards. International, National – Mandatory, Voluntary. - Sample preparation - Reporting results and reliability of analysis.
BLOCK-III	**Tests for specific raw food ingredients and Consumer Protection:**
Unit : V	**Tests for specific raw food ingredients and processed. Foods including additives**. a. Proximate Principles b. Nutrient analysis

	Quality parameters and tests of adulterants
Unit :VI	**Consumer protection.**

Recommended Book Readings:

- Park A. (2007), Park's Textbook of Preventive and Social Medicine XIX Edition M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur, 428 001(India)
- Bamji M.S, Prahlad Rao N, Reddy V (2004). Textbook of Human Nutrition II Edition, Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi Bhatt D.P (2008), Health Education, Khel Sahitya Kendra, New Delhi.
- Gibney MJ, Margetts BM, Kearney JM, Arab L (2004) Public Health Nutrition Blackwell Publishing Co. UK Swaminathan M (2007), Essentials of Food and Nutrition.
- An Advanced TextbookVol.I, The Bangalore Printing and Publishing Co. Ltd, Bangalore UNICEF.

Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 5th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE : UGHN-117	COURSE TITLE:PUBLIC HEALTH AND EPIDEMIOLOGY	

COURSE OBJECTIVES:

- To understand the concept of health from the individual and community perspective.
- To know the importance of epidemiology and demography in health.
- To access the health and nutritional status and analyse the situation.

COURSE OUTCOMES:

- CO1: Learners will be able to understand the concept of health from the individual and community perspective.
- CO2 Learners will be able to know the importance of epidemiology and demography in health.
- CO3: Learners will be able to access the health and nutritional status and analyse the situation.
- CO4: Learners will be able to know the factors affecting health and nutritional status of individual and community.

CREDITS: 4	**TYPE OF COURSE: DISCIPLINE SPECIFIC CORE COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Dimensions Of Health and Demography and Epidemiology:	
Unit I :	**Health and Dimensions Of Health:**Positive health versus absence of disease.
Unit II :	**Community and Its Organization:** Concept of community coma types of community, factors affecting health of the community- environmental, social, cultural, dietary organizational, economic, political. Vulnerable groups/ needs of special populations.
Unit III :	**Public Health, Demography and Epidemiology:** Demography and its applications. Epidemiology- study of the epidemiology approach- time distribution, place a person, determinants of disease: preventive and social means. Community Health through the lifespan. Vital statistics and their significance.
BLOCK-II	**Epidemiological Methods, Communicable, Infectious Disease and Waste Management:**
Unit IV :	**Epidemiological Methods:** Descriptive analytical experimental serological, clinical.
Unit V :	Communicable and Infectious Disease **Control:** Nature of communicable and infectious diseases, infection, contamination, this infections, decontamination, transmission- direct and indirect vector borne diseases, epidemiology of infection, interacting organisms and causative agents- their Microbiology environmental measures and epidemiological principles of Disease Control.
Unit VI :	**Community Water and Waste Management:** Importance of water to the

	community etiology and effects of toxic agents in board infectious agents, sources of water, save drinking water/ portability and test for portability. Community waste and waste disposal- disposal and treatment of solid waste and disposal liquid waste disposal.
BLOCK-III	**Community Food Protection, Food Adulteration and Immunization:**
Unit VII :	**Community Food Protection:** Epidemiology of foodborne diseases, matter transmission, can control of food protection and safety- e objectives, process and outcome, vector control, rodent control.
Unit VIII :	**Food Adulteration:** Laws governing food standards, significance- PFA, FPO, ISI, AGMARK meat product order, common adulterants in food and their effects on health, common household methods to detect adulterant in foods.
Unit IX :	**Lifestyle and Community Health:** Prevalence and primitive aspects, public education and action, alcohol, cigarettes smoking drugs, AIDS, STD diet and chronic diseases.
Unit X :	**Immunization:** Importance and schedule for children, adult and for foreign travel, problems encountered- importance of cold chain, role of individual, family and community in promoting health.

- **Recommended Book Readings:**
- Mahtab, S, Bamji, Kamala Krishnasamy, Brahmam, G.N.V. (2012)
- Text Book of HumanNutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- Srilakshmi, B. (2013), Dietetics, New Age International (P) Ltd., New Delhi.
- SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.
- Longvah, T, Ananthan, R, Bhaskarachary, K, Venkaiah, K. (2017). Indian Food Composition Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
- Shakuntala Manay, Shadaksharaswamy. M (2013) Foods, Facts and Principles, New• Age International Pvt Ltd Publishers, 2nd Edition) Ltd., New Delhi. Swaminathan, M. (2012)

Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.

Suggested Online Readings:

- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 5th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE : UGHN-118	COURSE TITLE:NUTRITION AND HEALTH COMMUNICATION	

COURSE OBJECTIVES:

- To understand thought diffusion processes of the individual and the community then as will be able to know if effective communication techniques methods.
- To plan and develop health nutrition education communication messages and strategies. .

COURSE OUTCOMES:

- CO1: Learners will be able to understand thought diffusion processes of the individual and the community then as will be able to know if effective communication techniques methods.
- CO2: Learners will be able to plan and develop health nutrition education communication messages and strategies. .
- CO3: Learners will be able to communicate on various issues related to health and nutritional status of individuals and the community.

CREDITS: 4	**TYPE OF COURSE: DISCIPLINE SPECIFIC CORE COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Concepts and Theories of Communication in Nutrition and Processes of NHC	
UNIT-I	**Concepts and Theories of Communication in Nutrition –** Health Definitions of concepts • Formal – non-formal communication, Participatory communication • Theories of NHC • History, need and relevance of NHC in India
UNIT-II	**The Components and Processes of NHC** • Concept of Behaviour Change Communication (BCC) from imparting information to Focusing on changing practices. of BCC: Sender, Message, Channel, Receiver • Various types of communication – interpersonal, mass media, visual, verbal/ non-Verbal. • Features of successful BCC • Market Research and Social Marketing
BLOCK-II Programs and Experiences of NHC and Nutrition - Health – Communication	
UNIT-III	**Programs and Experiences of NHC Global and Indian Perspective:** NHC in developed and developing nations: some examples • Evolution of NHC in India: traditional folk media to modern methods of communication. • Traditional folk media in Gujarat and its influence on NHC. • Communication for urban and rural environment; for target specific audience.
UNIT-IV	**Nutrition - Health – Communication in Government Programs and NGOs:** • Evolution of NHC/ IEC in Government nutrition health programs - shift in focus fromknowledge gain to change in practices.

	• Overview of NHC/IEC in government programs (Activities, strengths and limitations) –• a. NHC in ICDS b. Nutritional counseling in micronutrient deficiency control programs: control of IDA, IDD, VAD. • Strengths and limitations of NHC imparted in NGO programs.

RECOMMENDED BOOKREADINGS:

- Field guide to designing communication strategy, WHO publication-2007.

behaviour change consortium summary(1999-2003) www1.od.nih.gov.behaviourchange.

- Communication strategy to conserve/improve Public Health., John Hopkins University- Centre for Communication programmes.
- Michael Favin and Marcia Griffiths 1999, Nutrition tool kit-09-Communication for Behaviour change in Nutrition projects.
- Human Development Network-The World Bank1999 Harvard Institute of International Development (1981)
- Nutrition Education in Developing Countries, New York: Oelgeschlager Gunn and Hain Publishers Inc.
- Hubley J (1993) Communicating Health. London: Teaching Aids at Low Cost, London, UK.
- Academy for Educational Development (1988). Communication for Child Survival, AED, USA. Facts for Life (1990). A Communication Challenge. UNICEF / WHO / UNESCO /UNFPA, UK.

- **Suggested Online Readings:**
- https://www.nutritionintl.org
  https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

SIXTH SEMESTER

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 6th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :HNSEC-06	COURSE TITLE:BAKERY AND QUANTITY COOKERY	

COURSE OBJECTIVES:

- To Identify and explain baking terms, ingredients, equipment and tools.
- Employ safe food handling practices using contemporary guidelines
- Learn menu planning and techniques of food production.
- Competent to calculate the cost of food items.
- Scale and measure ingredients.
- Prepare yeast dough, quick breads, pies, cookies, cakes, icing, pate choux, and savory baking.
- Produce baked products using commercial ingredients and equipment.
- Develop skills in handling food service equipment.
- Gain skills to plan, prepare and present recipes.

COURSE OUTCOMES: learner should be able to:

- Resize recipes to meet production needs and equipment capacities.
- Scale, mix, mold, proof and bake yeast raised goods.
- Prepare cookies using various common dividing and panning techniques.
- Prepare home style crumb topped and two crust pies.
- Prepare product finishes such as washes, glazes, icings, frostings and fillings.
- Demonstrate proper storage techniques for all baked products.
- To develop skills for setting up a bakery unit. And to enhance entrepreneurial skills in bakery and confectionery.
- Construct a menu and develop the writing techniques and display of menu.
- Acquire pre-preparation and preparation skill
- Select and use different food production equipment
- Standardize recipe and apply quantity food production techniques for hospital dietaries.

CREDITS: 4	**TYPE OF COURSE: SKILL ENHANCEMENT COURSE**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I An Overview Of Bakery Industry, Preparation and Quality Evaluation of Bread and its Products:

UNIT-I	**An overview of Bakery Industry :** Current status and growth rate of bakery industry Economic importance in

	India. Classification of Baked Foods, Product Types, Nutritional Quality and Safety of Products, Storage and Packaging Materials, Basic baking principles Ingredients uses- liquid and flours (cereals types and flour quality) Guidelines to follow the standards & regulations. Forming the dough. Mixing and Gluten Development: Blending the ingredients, adding liquid to hydrate flour proteins , developing gluten Processes that occur during Mixing-Air cell formation, Hydration, Gluten development Controlling Gluten Development Methods for Adjusting Gluten Development- Other Ingredients and Additives, Salt, milk The Baking Process- Melting of fats, leavening, Formation and expansion of gases, Killing of yeast and microorganisms, Bread formulation: quality of materials like flour, shortening, yeast, chemical livener's, flour improvers, preparing bread formula on the basis of the role of ingredients Bread processing: Flying ferment, calculating desired water temperature, mixing/ kneading, bulk fermentation (physical and chemical changes in proofing), knock back, dough make up (Scaling, rounding, intermediate proofing, molding, panning), Proofing and factors affecting proofing, Baking time and temperature, deplaning, cooling, slicing Introduction and organization of a Bakery Unit Introduction and Organizational Structure of a bakery Unit Planning, layout and equipment used in bakery Unit. Pricing of bakery products – Cost Analysis, Costing Methods Hands on experience: Preparation of bread, bun
UNIT-II	**Preparation and Quality evaluation of Bread, Bun, Pastries cakes, Cake Decoration and Modified Bakery Products:** Role of ingredients and equipment's used Bread making process –Household Vs. Commercial Variety of breads, bun, and Pastries Product quality characteristics of Bread, Bun and pastries Sensory evaluation of Bread, Bun and pastries Hands on experience: Sensory evaluation of prepared bread & Bun Cake mixing methods, Types of cakes-Butter Cake, Sponge Cake and Eggless Cake Hands on experience: Preparation and evaluation of cakes Cake judging, Faults and remedies Different types and techniques of Cake Decoration -icings and fillings. Hands on experience: Modified baked products - high fiber, low / alternate sugar, low fat, gluten free, and millet based bakery products for special nutritional requirements.
BLOCK-II	**Preparation and quality evaluation of Biscuits and Menu planning and Food Facilities:**
UNIT-III	**Preparation and quality evaluation of Biscuits, Cookies Macroons, Muffins, Home Made Chocolates and Pies:** Methods, types and techniques, equipment's used for the preparation of Biscuits, Cookies macaroons and muffins Product quality, characteristics, faults and corrective measures of Cookies, biscuits, macaroons and muffins Hands on experience: Preparation & evaluation of Biscuits/Cookies/Muffins -Principles of sugar cookery Processing of Cocoa and Chocolate Role of ingredients and Processing methods Equipment Used, Product Development – Quality Characteristics, Sensory Evaluation of Products; Types – Hard – Boiled Candies, Crystalline and Non-Crystalline Candies, Toffees, Fruit Drops, Chocolates, Chocolate Chips, Fruit Pie, Apple Pie, Fudge, Fondant, Marsh Mellow, Chewing Gum, Jellies and Confectionaries Hands on experience: Preparation of Homemade chocolates

UNIT-IV	**Menu planning and Food Facilities**: Definition of menu, Menu pattern, importance of menu planning, factors influencing menu planning, Types of menu, framing of menu, writing a menu, menu presentation and display, purchasing procedures, storage techniques. Planning Kitchen Layouts, Fuel Management and waste disposal methods.
UNIT-V	**Production Planning and Quantity Food production:**Equipment at Functional Areas for quantity Cookery – Receiving, Purchasing, Storage, Preparation, Production, Service, Waste Disposal Areas. Production forecasting, Production scheduling, Duties and responsibilities of Production staff, standardization of recipes, portion control, Stepping up of recipes of different cuisines. Product standards, Table Setting Procedures, effective utilization of leftovers.

Recommended Book Readings:

- S.C. (2017). Basic Baking, 5th Edition, ChanakyaMudrakPvt. Ltd., New Delhi.
- Rainact, AL. (2013). Basic Food Preparation – Complete Manual, 3rd Edition, Orient Longman Pvt Ltd., Mumbai
- Manay, S &Shanaksharaswami, M. (2014).Foods : Facts and Principles, New Age Publishers, New Delhi Samuel A, Martz (2004).
- Bakery Technology and Engineering, PAN-TECHI International Incorporated P.Ltd, Madras. Faridi, F (2004).
- Dough Rheology and Baked Product Texture, CBS Publication, New Delhi June Payne-Palacio, and Monica Theis Food service Management: Principles and Practices, 13th Edition Pub. Harlow :Pearson 2016.
- Sethi M. and Malhan S.M., Catering Management an Integrated approach (2015), 3rd edition, Published by New Age International Private Limited.
- Reynolds, D. Onsite Food service Management- A best practices approach John Wiley and Sons, Inc, 2013.
- Mary B. Gregoire, Food Service Organizations: A Managerial and Systems Approach, Prentice Hall 2015 Palacio, J.P., Harger, V., Shugari, G. Thesis, M (2001).
- West and Woods Introduction to Food Service. Mac Millan Pub Co., New York.

Parvinder S.Bali, Quantity Food Production Operations and Indian Cuisine (2011), published by

Oxford University Press.

- Cessarani,V.Kinton,R (2002). Practical Cookery. seventh edition. Hodder and Stoughton publishers. Khan, M.A (2003). Food Service Operations. AVI Publications Co., Connecticut.

Suggested Online Readings:

- https://www.nutritionintl.org
- https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 6th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE :UGHN-119	COURSE TITLE:INSTITUTIONAL FOOD MANAGEMENT	

COURSE OBJECTIVES:

- To equip the students with the multi-dimensional knowledge associated with institutional food service in a given setup
- To enable them in planning, execution and control of the management of institutes with ease and profit.

COURSE OUTCOMES: This course will help students to:

- Act as front office managers
- Skilled in centralized/ decentralized service providers in medical/ care homes
- Skilled chef and service providers

CREDITS: 4	**TYPE OF COURSE: DISCIPLINE SPECIFIC CORE COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Food service management and Record keeping	
UNIT-I	**Food service management:** Types of food services - organization and management. Tools of management; FSSAI and CODEX guidelines.
UNIT-II	**Record keeping:** Personnel management; Books, records and record keeping; Cost control in food services; Menu planning; HACCP.
BLOCK-II Quantity food production and Planning of Food Service Unit	
UNIT-III	**Quantity food production:** Meal services management; Types of services; Quantity food production; Principles involved in development of recipes in large scale cooking; Standardization of recipes; Utilization of left-over foods.
UNIT-IV	**Planning of food service unit:** Types of kitchens; Planning of layout and equipment for food services; Sanitation and hygiene in handling foods; Personnel hygiene and its importance; Organization of spaces

Suggested BookReadings:

- Arora RS. 2012. Banquet and Catering Management. Abhijeet Publications.
- Beckley JH, Herzog LJ and Foley MM. 2017. Accelerating New Food Product Design and Development. 2nd Edition, John Wiley and Sons Inc. Hoboken, New Jersey.
- Carpenter RP, Lyon DH and Hasdell TA. 2002. Guidelines for Sensory Analysis in Food Product Development and Quality Control. 2nd Edition, Aspen Publishers Inc. New York.
- Earle M and Earle RL. 2008. Case Studies in Food Product Development. Woodhead Publishing Limited and CRC Press, New York.
- Harish Bhat. 2008. Hotel Management. Crescent Publishing Corporation.
- Moskowitz HR, Straus T and Saguy S. 2009. An Integrated Approach to New Food Product Development. CRC Press, Boca Raton, Florida.
- Mudit Bhajwani. 2007. Food Service Management: Principles and Practice. Rajat publications, New Delhi.
- Nancy LS. 2007. Catering Management. John Wiley & Sons.

- Puckett RP. 2012. Food Service Manual for Health Care Institutions. 4th Edition, John Wiley and Sons Inc. Hoboken, New Jersey.
- Sethi M. 2018. Catering Management- An Integral Approach. 3rd Edition, New Age International, New Delhi.
- Vaclavik V (2018) Dimensions of Food. CRC Press.

Suggested Online Readings:

- https://www.nutritionintl.org
- https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org
- https://www.ferrerofoodservice.com
- https://www.foodservicedirector.com

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 6th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE : UGHN-120	COURSE TITLE:POLICY PROGRAM AND INTERVENTIONS	

COURSE OBJECTIVES: This course should be enabling the students to:

- Know the policies concerning health and nutrition
- Understand the mechanism and factors related to formulation of policies for food and health nutrition as well as welfare and development policies.
- Be familiar with the nutritional and health problems in the country and various reasons.
- No about ongoing schemes and programs for improving nutrition and health.
- Be familiar with various interventions currently in use in the country and elsewhere

COURSE OUTCOMES:

- CO1: Learners will be able to know the policies concerning health and nutrition.
- CO2: Learners will be able to understand the mechanism and factors related to formulation of policies of food health nutrition as well as welfare and development policies.
- CO3: Learners will be able to be familiar with the nutritional and health problems in the country and various regions.
- CO4: Learners will be able to know about ongoing schemes and programmes for improving nutrition and health.

CREDITS: 4	**TYPE OF COURSE: DISCIPLINE SPECIFIC CORE COURSES**
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I	**Current situation in India, Need for policies**
Unit I:	**Current situation in India with regard to National and regional level rural urban:** Food availability, mortality, morbidity and illness, nutritional problems economic status, population and infrastructure available environmental sanitation women and children: situation. Povertylines its significance.
Unit II:	**Need for policies-** Factors leading to current problems/ situation (cultural economic, commercial/ market forces, laws and regulations).
BLOCK-II	**Policies existing in the country, Nodal Ministries and departments**
Unit III:	**Policies existing in the country**- Agriculture, food, health, nutrition, development policies which have in their perspectives and goals- improvement of Health and nutritional status. Factor take when policies..
Unit IV:	**Nodal Ministries and departments at Central and state level responsible for formulation and implementation of policies.**
BLOCK-III	**Programs and schemes, Objectives of each programs/ scheme**
Unit V:	**Programs and schemes available in various sectors with the aim of improving health and nutritional status of the population-** Agriculture, food, nutrition, health, economic water environment and its relation to health.
Unit VI:	**Objectives of each programs/ scheme, focus and target groups-** Coverage principles, /Philosophy/ intervention strategies. Mode of

	implementation, operationalization. For selection of target group and benefit through the scheme/ program. Current status, success and games in focus, coverage operational hurdles and deficiencies thereof.
Unit VII:	**Legislations-** role of improve improving health and nutritional status.
BLOCK-IV	**Nutritional plan of action and Case studies of intervention**
Unit VIII:	**Nutritional plan of action** - State plan of action, goal to improve health and nutritional status.
Unit IX:	**Case studies of intervention used in other countries or within country to improve health and nutritional status.**

Recommended Book Readings:

- Arora RS. 2012. Banquet and Catering Management. Abhijeet Publications.
- Beckley JH, Herzog LJ and Foley MM. 2017. Accelerating New Food Product Design and Development. 2nd Edition, John Wiley and Sons Inc. Hoboken, New Jersey.
- Carpenter RP, Lyon DH and Hasdell TA. 2002. Guidelines for Sensory Analysis in Food Product Development and Quality Control. 2nd Edition, Aspen Publishers Inc. New York.
- Earle M and Earle RL. 2008. Case Studies in Food Product Development. Woodhead Publishing Limited and CRC Press, New York.
- Harish Bhat. 2008. Hotel Management. Crescent Publishing Corporation.
- Moskowitz HR, Straus T and Saguy S. 2009. An Integrated Approach to New Food Product Development. CRC Press, Boca Raton, Florida.
- Mudit Bhajwani. 2007. Food Service Management: Principles and Practice. Rajat publications, New Delhi.
- Nancy LS. 2007. Catering Management. John Wiley & Sons.
- Puckett RP. 2012. Food Service Manual for Health Care Institutions. 4th Edition, John Wiley and Sons Inc. Hoboken, New Jersey.
- Sethi M. 2018. Catering Management- An Integral Approach. 3rd Edition, New Age International, New Delhi.

Vaclavik V (2018) Dimensions of Food. CRC Press.

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- https://www.nutritionintl.org
- https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org
- https://www.ferrerofoodservice.com
- https://www.foodservicedirector.com

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PROGRAMME: B.SC.	YEAR: 2023	SEMESTER: 6th
PROGRAMME : HUMAN NUTRITION		PROGRAMME : 1116
COURSE CODE : UGHN-121	COURSE TITLE:FAMILYMEAL MANAGEMENT	

COURSE OBJECTIVES: This course should be enable the students to:

- Study the growth and development during various stages of life span
- Understand the basics for recommending the dietary allowances
- Study nutritional needs at different stages of life span
- Gain experience in planning adequate diets for different age groups and for different income

groups.

COURSE OUTCOMES:

- Design food plans and assess the adequacy of diets to meet the nutritional needs of humans at various stages of life cycle.
- Assess nutrition issues and conditions and also recommend nutrition intervention and support to promote the health and wellbeing.
- Have the knowledge, both to develop and critique nutritional interventions designed to

Improve human health and well-being at specific age associated time points.

- On completion of the course students will be able to critically assess nutritional requirementsand nutritional health status of an individual.

CREDITS: 4	TYPE OF COURSE: Discipline Specific Core Courses
MAXIMUM MARKS :100	**MINIMUM MARKS : 36**

BLOCK-I Introduction to RDA and Balanced Diet and Nutrition in Pregnancy:

UNIT-I	**Introduction to RDA and Balanced Diet:** Basic concept and purposes of Recommending the Dietary Allowances, Factors Affecting Recommended Dietary Allowances Requirements and Recommended Dietary Allowances for various age groups Uses of ICMR- RDA in planning balance diet Exchange system and Dietary Diversity
UNIT-II	**Nutrition in Pregnancy and Lactation:** Physiological Changes occurring during Pregnancy Importance of Food and Nutritional Care and Requirement during pregnancy ,General Dietary and nutritional Problems and Complications, Physiology and Hormones involved in Lactation Food supplements, Factors Affecting the Volume and Composition of Breast Milk, Nutritional Requirements during lactation.
BLOCK-II	**Nutrition in Infancy, Childhood, Adolescence and for Adults:**

UNIT-III	**Nutrition in Infancy :** Growth and Development of Infants,Composition of Human Milk and Human Milk Substitute, Bottle Feeding and related Problems, Weaning and Supplementary Feeding Foods, Feeding Problems and Complications. Use of growth charts and standards and prevention of growth faltering
UNIT-IV	**Nutrition in Childhood and Adolescence:** Growth and Development of Pre School,School Going Children and Adolescence. Food and Nutritional Requirements, Factors to be considered while Planning Diet for Children and Adolescents, Growth Spurt during Adolescence. Food Habits, Dietary Guidelines, Food and Nutritional Requirements, Nutritional and Behavioral Problems and Eating Disorders.
UNIT-V	**Nutrition for Adults and Elderly:** Reference Man and Reference Woman, Food and Nutritional Requirements for Adults doing Different Activities, Processes of Aging, Food and Nutritional Requirements of Elders, Nutrition Related Problems of Old Age, Dietary Guidelines and diet Modifications.

Suggested Online Readings:

- https://www.nutritionintl.org
- https://www.hsph.harvard.edu/nutritionsource
- https://www.nutrition.org.uk
- http://www.nutritioncare.org
- https://www.ift.org
- https://www.foodsciencematters
- https://www.ifst.org
- https://www.ferrerofoodservice.com
- https://www.foodservicedirector.com

Recommended Book Readings:

- Mahtab, S, Bamji, Kamala Krishnasamy, Brahmam, G.N.V. (2012)
- Text Book of HumanNutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- Srilakshmi, B. (2013), Dietetics, New Age International (P) Ltd., New Delhi.
- SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.
- Longvah, T, Ananthan, R, Bhaskarachary, K, Venkaiah, K. (2017). Indian Food Composition Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderabad.
- Shakuntala Manay, Shadaksharaswamy. M (2013) Foods, Facts and Principles, New• Age International Pvt Ltd Publishers, 2nd Edition) Ltd., New Delhi. Swaminathan, M. (2012)
- Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore.

This course can be opted as an elective by the students of following subjects: NA

Suggested equivalent online courses (MOOCs) for credit transfer :NA

PRACTICAL WORKS:

UGHN104 (P)	**Lab work based on UGHN- 101,102,103**
UGHN108 (P)	**Lab work based on UGHN -105,106,107**
UGHN 112 (P)	**Lab work based on UGHN -109,110**
UGHN 116 (P)	**Lab work based on UGHN - 113,114,115**
UGHN 120 (P)	**Lab work based on UGHN - 117,118,119**
Note: The topic of practical will be selected form relevant theory paper as per suggestion of relevant faculty members of study center.	

APPENDIX-II

Guidelines for Research Project (**RP-101N**) is available at link:

http://14.139.237.190/upload_pdf/01_02_2023_Common_Guidlines_forc_Literature_Review.pdf……..

APPENDIX-III

Internship Policy: Guidelines and Procedures

(With Effect from Academic Year 2023-24)

Is available at link:

http://14.139.237.190/upload_pdf/01_02_2023_Guidlines_for_Internship.pdf……..

APPENDIX-III

Guidelines for Course Code: LS-101N

Guidelines for Preparing Literature Survey

The guidelines taken from [1] are simply for illustration purpose to write the literature survey. You can also talk to your supervisor for any guidance during writing the literature survey.

A literature survey is a kind of review of academic sources on a particular topic. It provides a general idea of existing knowledge, allowing you to classify related theories, methods, and any gaps in the existing research.
The literature survey is normally conducted to put your research within existing knowledge while writing dissertation, thesis or research paper. The literature survey provides you a chance to:

- Show your acquaintance with the topic
- Build a theoretical framework and methodology for the research
- Align yourself with respect to other researchers
- Give an idea about how your research addresses a gap

It is also possible that you are writing a literature survey as a stand-alone researcher. In this case, the intention is to judge and demonstrate your knowledge about the current state of research to make academic debates on a specific topic.
In both the above cases, the process of conducting a literature survey remains the same.
To write a literature review, it involves finding pertinent publications (such as books, conference papers and journal articles), decisively analyzing them, and explaining what you found. This process involves major five steps:

1. **Search** for relevant literature
2. **Evaluate** and selectsources
3. **Identify** themes, debates and gaps
4. **Outline** the structure
5. **Write** your literature survey

A literature survey not only summarizes the existing knowledge on a specific topic, it also analyzes, synthesizes, and critically evaluates the existing sources to give a clear picture of the state of knowledge on the subject.

Step 1: Search for relevant literature

(a) Definite topic is required before starting the literature survey.
(b) Make a list of similar or related keywords linked to your research question. Try to add new keywords in this list if you find any new keywords in the process of your literature search.
(c) Search for relevant sources: The keywords obtained from step (b) above are

used for searching the sources. Some of the useful databases to search for journals and articles include:

- Library catalogue of your University or college
- Inspect (physics, engineering and computer science)
- DBLP (basic sciences, engineering and computer science)
- Project Muse (humanities and social sciences)
- Medline (life sciences and biomedicine)
- Aconite (economics)
- Google Scholar
- JSTOR
- EBSCO

You can use Boolean operators like AND, OR and NOT to refine your searches.
You can also read the abstract and identify that whether it is useful for your specified topic. If it is useful than check its bibliographic references to back track and identify previous relevant sources.

Step 2: Evaluate and select sources

Before selecting the correct source of knowledge you should evaluate which article or source is useful for your definite topic of research. While reading any article, ask the following question to yourself:

- What kind of problem or question is addressed by the author?
- What are the key features and concepts of the article?
- Is the article addresses some new theories, models and methods or uses some established frameworks?
- What are the results and conclusions of the article?
- How the article helps you to relate to other literature in the field?
- Is article helps in your topic? What are its key theories, concepts and arguments?
- What are the strengths and weaknesses of the research?

While selecting any article, must sure that you read any landmark studies and major theories in your field of research so that its contents are trustworthy. This can be checked by the citation count of the article using Google Scholar. A high citation count specifies that article is significant in the field of research and shall be included in the literature survey.

Step 3: Identify themes, debates, and gaps

Before starting the argument and structure of literature survey, you should be aware of the connections and relationships between the sources you have read so far. Based on your reading and notes, you can come across for:

- **Trends and patterns (in theory, method or results):** Is approaches you read are still useful or becomes less popular over time?
- **Themes:** Which kind of questions or concepts reappear across the literature?
- **Debates, conflicts and contradictions:** Is different sources disagree to some extent?
- **Essential publications:** Is there any theories or studies that are prominent and changed the direction of the field?
- **Gaps:** Still is there any possibility to explore new things from the read literature you have read and still missing in the literature? Is there any weaknesses that need to be addressed?

The above steps will let you to prepare the structure of your literature survey and (if applicable) give you an idea about how your own research will contribute to existing

knowledge.

Step 4: Outline your literature survey's structure

Prepare a rough idea of your approach before writing the literature survey. There are many ways to organize the body of a survey. Depending on the length of your literature survey, many of these strategies are clubbed.

(a) Prepare a list of development of sources or topics and arrange them with respect to time. Critically analyze, show key points and summarize them in a brief
(b) If you found some recurring themes, put them in subsection of central theme and concentrate to different aspects of the topic.
(c) If you read the sources from different fields or discipline, than compare the results and conclusions arises from the different methods.
(d) Any literature survey is a backbone of new theoretical framework. While writing the literature survey, you should converse different theories, models and key points of read topics.
(e) At last and not the least, argue yourself for the significance of certain theoretical methods, or may combine different concepts to create your own framework for your future research.

Step 5: Write your literature survey

The literature survey should have an introduction, main body of the text followed by conclusion. The contents on each can be your choice depending upon the requirement of your research.

Reference:

1. https://www.scribbr.com/dissertation/literature-review/ (Author: Shona McCombes)