YBN UNIVERSITY

Established by the Act of Government of Jharkhand Act15, 2017
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As per Section 2(f) of UGC Act.1956

NEP-2023

FOOD AND NUTRITION COURSE/STRUCTURE

For

FOUR YEAR UNDERGRADUATE PROGRAMMES
(FYUGP)
UNDER YBNU RANCHI JHARKHAND
Implemented in Department of Food and Nutrition (School of Science)

Semester-I, II, III, IV,V,VI,VII &VIII

From

Academic Session-2023

RAJAULATU, NAMKUM, RANCHI, JHARKHAND-834010

COURSE OF STUDY OF FOUR YEAR UNDERGRADUATE PROGRAMME FOR (1) YEAR-2023 onwards

COURSES OF STUDY FOR FOUR YEAR UNDERGRADUATE PROGRAMME

Table l: Course structure for Undergraduate Certificate Programme [May Exit after Sem.-II]

Semester	Common Course		Introductory Course	Major		Total credits	
Sem-I	LCS (MIL/TRL)	Understanding India	Health & Wellness, Yoga Education, Sports & Fitness	IRC-1	IVS-1A	MJ-1	
	(6Credits)	(2Credits)	(2Credits)	(3Credits)	(3Credits)	(6Credits)	(22)
Sem-II	LCS (Hindi)	Global Citizenship	Mathematical & Computational	IRC-2	IVS-1B	MJ-2	
	(6Credits)	Education (2Credits)	Thinking (2Credits)	(3Credits)	(3Credits)	(6Credits)	(22)

Total = 44 Credits

(LCS: Language and Communication Skills; MIL: Modern Indian Languages; TRL: Tribal Regional Languages; IRC: Introductory Regular Courses; IVS; Introductory Vocational Studies, MJ: Major)

Table 2: Course structure for Undergraduate Diploma Programme [May Exit after Sem.-IV]

Semester	Common Course			Introductory Course	Major	Minor	Internship/ Project	Vocational	Total credits
Sem-III	Environmental Studies	Community Engagement/ NCC/NSS	Digital Education	IRC-3	MJ-3		Internship/ Project		
	(3Credits)	(3Credits)	(3Credits)	(3Credits)	(6Credits)		(4Credits)		**(22)**
Sem-IV					MJ-4, MJ-5	MN-1		VS-1	
					(6+6=12 Credits)	(6Credits)		(3Credits)	**(22)**

Total=88Credits

(MN: Minor; VS: Vocational Studies)

Table 3: Course structure for Bachelor's Degree Programme [May Exit after Sem-VI]

Semester	Major Course	Minor Course	Vocational	Total Credits
Sem-V	MJ-6, MJ-7	MN-2	VS-2	
	(6+6=12Credits)	(6Credits)	(4Credits)	(22)
Sem-VI	MJ-8, MJ-9	MN-3	VS-3	
	(6+6=12Credits)	(6Credits)	(4Credits)	(22)

Total=132Credits

Table 4: Course Structure for Bachelor's Degree with Hons. /Research Programme

Semester	Advance course	Research Course		Vocational	Total Credits
Sem-VII	AMJ-1, AMJ-2	Research Methodology			
		(6+6=12Credits)		(4Credits)	(22)
Sem-VIII	AMJ-3, AMJ-4	Research Int./Field Work	Research Report	VSR	
	(6+6=12Credits)	(4Credits)		(2Credits)	(22)

Total=176 Credit

(AMJ: Advance Major: VSR: Vocational Studies associated with Research)

SEMESTER WISE COURSE OF STUDY FOR FOUR YEAR UNDERGRADUATE PROGRAMME 2023 ONWORDS B.Sc. FOOD AND NUTRITION SCIENCE CODE- (1Y4FNT)

Table 5: Semester Wise Course Code and Credits Points:

Semester	Common, Introductory, Major, Minor, Vocational & Internship Course		Examination Structure				
	Code	Paper	Credits	Theory	Internal Assessment	Practical	Total
I	1Y4CC-1	Language and Communication Skills (Modern Indian Language including TRL)	6	75	25	--	100
	1Y4CC-2	Understanding India	2	75	25	--	100
	1Y4CC-3	Health & Wellness, Yoga Education, Sports & Fitness	2	50	25	25	100
	1Y4FNTIRC-1	Introductory Regular Course-1 **Human physiology**	3	50	25	25	100
	1Y4IVS-1A	Introductory Vocational Studies-I **Digital Marketing IRVC**	3	50	25	25	100
	1Y4FNTMJ-1	Major paper-1 (Disciplinary/Interdisciplinary Major) **Fundamentals of Human Nutrition**	6	50	25	25	100
II	2Y4CC-4	Language and Communication Skills (Hindi)	6	75	25	--	100
	2Y4CC-5	Mathematical and Computational Thinking Analysis	2	50	25	25	100
	2Y4CC-6	Global Citizenship Education & Education for Sustainable Development	2	50	25	25	100
	2Y4FNTIRC-2	Introductory Regular Course-2 **Biochemistry**	3	50	25	25	100
	2Y4IVS-2B	Introductory Vocational Studies-2 **Digital Marketing IRVC**	3	50	25	25	100
	2Y4FNTMJ-2	Major paper-2 (Disciplinary/Interdisciplinary Major) **Principal of food science**	6	50	25	25	100
III	2Y4EVSCC-7	Environmental Studies/EVS	3	50	25	25	100
	2Y4CC-8	Digital Education (Elementary Computer Applications)	3	50	25	25	100
	2Y4CC-9	Community Engagement & Service (NSS/NCC/Adult education)	3	50	25	25	100

	3Y4FNTIRC-3	Introductory Regular Course-3 **Basic of food science and nutrition**	3	50	25	25	100
	3Y4IAP	Internship/Apprenticeship/Project	4	50	25	25	100
	3Y4FNTMJ-3	Major paper-3 (Disciplinary/Interdisciplinary Major) **Lifespan Nutrition-1**	6	50	25	25	100
IV	4Y4FNTMJ-4	Major paper-4 (Disciplinary/Interdisciplinary Major) **Therapeutic nutrition**	6	50	25	25	100
	4Y4FNTMJ-5	Major paper-5 (Disciplinary/Interdisciplinary Major) **Lifespan nutrition -2**	6	50	25	25	100
	4Y4FNTMN-1	Minor paper-1 (Disciplinary/Interdisciplinary Minor) **Dietetics-1**	6	50	25	25	100
	4Y4IVS-1	Vocational Studies-1 (Minor) **Introduction to Stock Market**	4	50	25	25	100
	4Y4VS-1	Introduction to stock Market-1 (Minor)	4	50	25	25	100
V	5Y4FNTMJ-6	Major paper 6 (Disciplinary/Interdisciplinary Major) **Quality control-1**	6	50	25	25	100
	5Y4FSNMJ-7	Major paper 7 (Disciplinary/Interdisciplinary Major) **Food Microbiology**	6	50	25	25	100
	5Y4FSNMN-2	Minor Paper 2 (Disciplinary/Interdisciplinary Minor) **Dietetics-2**	6	50	25	25	100
	5Y4VS-2	Vocational Studies 2 (Minor)	4	50	25	25	100
VI	6Y4FSNMJ-8	Major paper 8 (Disciplinary/Interdisciplinary Major) **Quality control -2**	6	50	25	25	100
	6Y4FSNMJ-9	Major paper 9 (Disciplinary/Interdisciplinary Major) **Community Nutrition or diet counselling or Nutrition Assessment and surveillance**	6	50	25	25	100
	6Y4FSNMN-3	Minor Paper 3 (Disciplinary/Interdisciplinary Minor) **Food service management or postharvest technology or food processing**	6	50	25	25	100

	6Y4VS-3	Vocational Studies 3 (Minor)	4	50	25	25	100
VII	7Y4FSNAMJ-1	Advance Major paper 1 (Disciplinary/Interdisciplinary Major) **Food Safety and Preservation**	6	50	25	25	100
	7Y4FSNAMJ-2	Advance Major paper 2 (Disciplinary/Interdisciplinary Major) **Fermentation Technology**	6	50	25	25	100
	7Y4RC-1	Research Methodology	6	75	-	25	100
	7Y4RC-2	Research Proposal	4	75	-	25	100
VIII	8Y4FSNAMJ-3	Advance Major paper 3 (Disciplinary/Interdisciplinary Major) **Functional food and Nutraceuticals or Food Biotechnology or food packaging**	6	50	25	25	100
	8Y4FSNAMJ-4	Advance Major paper 4 (Disciplinary/Interdisciplinary Major) **Health and Fitness**	6	50	25	25	100
	8Y4RC-3	Research Internship/Field Work	4	75	-	25	100
	8Y4RC-4	Research Report	4	75	-	25	100
	8Y4VSR	Vocational Studies (Associated with Research)	2	75	-	25	100
			Total Credit 176				

Abbreviations:

CC Common Course
IRC Introductory Regular Courses
IVS Introductory Vocational Courses
IAP Internship/Apprenticeship/Project
VS Vocational Studies
MJ Major Disciplinary/Interdisciplinary Courses
MN Minor Disciplinary/ Interdisciplinary Courses
AMJ Advance Major Disciplinary/ Interdisciplinary Courses
RC Research Courses
VSR Vocational Studies associated with Research

Table 6: Semester Wise Course Code and Credits Points:

Semester	Common, Introductory, Major, Minor, Vocational & Internship Courses		Examination Structure				
	Code	Papers	Credits	Theory	Internal Assessment	Practical	Total
I	1Y4FNTMJ-1	Fundaments of Human Nutrition	6	50	25	25	100
II	1Y4FNTMJ-2	Principal of food science	6	50	25	25	100
III	1Y4FNTMJ-3	Lifespan Nutrition-1	6	50	25	25	100
IV	1Y4FNTMJ-4	Therapeutic nutrition	6	50	25	25	100
	1Y4FNTMJ-5	Lifespan nutrition-2	6	50	25	25	100
V	1Y4FNTMJ-6	Quality control-1	6	50	25	25	100
	1Y4FNTMJ-7	Food microbiology	6	50	25	25	100
VI	1Y4FNTMJ-8	Quality control-2	6	50	25	25	100
	1Y4FNTMJ-9	Community nutrition or diet counselling or nutrition assessment and surveillance	6	50	25	25	100
VII	1Y4FNTAMJ-1	Food safety and preservation	6	50	25	25	100
	1Y4FNTAMJ-2	Fermentation technology	6	50	25	25	100
	1Y4FNTRC-1	Research methodology	6	50	25	25	100
	1Y4FNTRC-2	Research proposer	4	50	25	25	100
VIII	1Y4FNTMJ-3	Functional food and nutraceuticals or food biotechnology or food packaging	6	50	25	25	100
	1Y4FNTAMJ-4	Health and fitness	6	50	25	25	100
	1Y4 RC-3	Research Internship/Field Work	4	---	---	---	100
	1Y4 RC-4	Research Report	4	---	---	---	100
	1Y4 VSR	Vocational Studies (Associated with Research)	2	50	25	25	100
		Total Credit	**98**				

Table 7: Semester wise Course Code and Credit Points:

Semester	Common, Introductory, Major, Minor,Vocational & Internship Courses		Examination Structure				
	Code	Papers	Credits	Theory (F.M.)	Internal Assessment	Practical	Total
I/ II/ III	IRC	Human physiology/Bio-chemistry/Basic food science and nutrition	3	50	25	25	100
IV	MN-1	Dietetics-1	6	50	25	25	100
V	MN-2	Dietetics-2	6	50	25	25	100
VI	MN-3	Food service management or postharvest technology or food processing	6	50	25	25	100

Table 8: Semester wise Course Code and Credit Points:

Semester	Common, Introductory, Major, Minor, Vocational & Internship Courses						
	Code	Papers	Credits	Theory (F.M.)	Internal Assessment	Practical	Total
I	1Y4IVSOF-1A	ORGANIC FARMING –IRC-1	2	50	25	25	100
	1Y4IVSDM-1A	DIGITAL MARKETING – IRC-2	2	50	25	25	100
	1Y4IVSCM-1A	COMPUTER BASICS AND MULTIMEDIA –IRC-3	2	50	25	25	100
	1Y4IVSEWS-1A	ENGINEERING WORKSHOP-IRC-4	2	50	25	25	100
	1Y4IVSED-1A	ENGINEERING GRAPHICS-IRC-5	2	50	25	25	100
	1Y4IVSEMC-1A	ENTREPRENEURSHIP AND MANAGEMENT CONCEPTS-IRC-6	2	50	25	25	100
	1Y4IVSOB-1A	ORGANIZATION BEHAVIOUR-IRC-7	2	50	25	25	100
II	2Y4IVSOF-2B	ORGANIC FARMING –IRC-1	2	50	25	25	100
	2Y4IVSDM-1B	DIGITAL MARKETING – IRC-2	2	50	25	25	100
	2Y4IVSCM-1B	COMPUTER BASICSAND MULTIMEDIA–IRC-3	2	50	25	25	100
	2Y4IVSEWS-1B	ENGINEERING WORKSHOP-IRC4	2	50	25	25	100

	2Y4IVSED-1B	ENGINEERING GRAPHICS-IRC-5	2	50	25	25	100
	2Y4IVSEMC-1B	ENTREPRENEURSHIP AND MANAGEMENT CONCEPTS-IRC-6	2	50	25	25	100
	2Y4IVOB-1B	ORGANIZATION BEHAVIOUR-IRC-7	2	50	25	25	100

AIMS OF BACHELOR'S DEGREE PROGRAMME IN FOOD AND NUTRITION

The broad aims of bachelor's degree programme in Food and Nutrition are:

The aim of bachelor's degree programme in food and nutrition is intended to provide:

a) Broad and balance knowledge in food and nutrition in addition to understanding of key food concepts, principles, and theories.
b) To develop students' ability and skill to acquire expertise over solving both theoretical and applied Physics problems.
c) To provide knowledge and skill to the students' thus enabling them to undertake further studies in Physics in related areas or multidisciplinary areas that can be helpfulfor self-employment/entrepreneurship.
d) To provide an environment that ensures cognitive development of students in aholistic manner. A complete dialogue about Physics and its significance is fostered in this framework, rather than mere theoretical aspects
e) To provide the latest subject matter, both theoretical as well as practical, such a way to foster their core competency and discovery learning. A Physics graduate as envisioned in this framework would be sufficiently competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment.
f) To mold a responsible citizen who is aware of most basic domain-independent knowledge, including critical thinking and communication.
g) To enable the graduate, prepare for national as well as international competitive examinations, especially UGC-CSIR NET, GATE, JAM, JEST, and UPSC Civil Services Examination.
h) To enable student, seek their career in the field of Research, Applied Physics, Energy, Technology, Geophysics and meteorology, Space and Astronomy, Radiation Physics, Instrumentation, Oceanography and such many fields with a further specialization in the same.

PROGRAM LEARNING OUTCOMES

The broad aims of Bachelor's degree programme in Food and Nutrition are:

The student graduating with the Degree Honours /Research in Food and Nutrition would be able to:

a) Core competency: Students will acquire core competency in the subject food and Nutrition, and in allied subject areas.
b) Systematic and coherent understanding of the fundamental concepts in Food and nutrition and other related allied food and Nutrition subjects.
c) Students will be able to use the evidence based comparative food and nutrition approach toexplain the scientific and technological problems.
d) The students will be able to understand the laws of nature.
e) Students will be able to understand the basic principle of equipment, instruments used in the food and nutrition laboratory.
f) Students will be able to demonstrate the experimental techniques and methods of their area of specialization in food and nutrition.
g) Disciplinary knowledge and skill: A graduate student are expected to be capable of demonstrating comprehensive knowledge and understanding of both theoretical and experimental/applied food and nutrition knowledge in various fields of interest like Medical field, Hotel, Industrial field, school, college etc. Human nutrition and Biochemistry, Microbiology, Food safety and preservation and Therapeutic nutrition and Lifespan nutrition, Dietetics, quality control, community nutrition and diet counselling or nutrition Assessment and surveillance, food service management or postharvest technology or food processing, fermentation technology, nutraceuticals or food biotechnology and food packaging, Health and Fitness, etc.
h) Skilled communicator: The course curriculum incorporates basics and advanced training in order to make a graduate student capable of expressing the subject through technical writing as well as through oral presentation.
   Critical thinker and problem solver: The course curriculum also includes components that can be helpful to graduate students to develop critical thinking ability by way of solving health problems knowledge and concepts.
i) Sense of inquiry: It is expected that the course curriculum will develop an inquisitive characteristic among the students through appropriate questions, planning and reporting experimental investigation. Team player: The course curriculum has been designed to provide opportunity to act as team player by contributing in laboratory, field-based situation and industry.
j) Skilled project manager: The course curriculum has been designed in such a manner as to enable a graduate student to become a skilled project manager by acquiring knowledge about food and health project management, writing, planning, study of ethical standards and rules and regulations pertaining to scientific project operation.
k) Digitally literate: The course curriculum has been so designed to impart a goodworking knowledge in understanding and carrying out data analysis, use of library search tools, and use of simulation software and related computational work.

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

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

SEMESTER-I

Semester	Course Structure For Semester I Common, Introductory, Major, Minor, Vocational & Internship Course						
	Code	**Paper**	**Credits**	**Theory**	**Internal Assessment**	**Practical**	**Total**
I	1Y4CC-1	Language and Communication Skills (Modern Indian Language including TRL)	6	75	25	--	100
	1Y4CC-2	Understanding India	2	75	25	--	100
	1Y4CC-3	Health & Wellness, Yoga Education, Sports & Fitness	2	50	25	25	100
	1Y4FNTIRC-1	Introductory Regular Course-1 **Human physiology**	3	50	25	25	100
	1Y4IVS-1A	Introductory Vocational Studies-I **Digital Marketing** **IRVC**	3	50	25	25	100
	1Y4FNTMJ-1	Major paper-1 (Disciplinary/Interdisciplinary Major) **Fundamentals of Human Nutrition**	6	50	25	25	100

SEMESTER I

COMMON COURSE –CC 1:

Language and Communication Skills (Modern Indian Language including TRL)

ENGLISH LANGUAGE &, COMMUNICATION SKILLS (1Y4CC-1)

Credits: 6) Total Marks: 100

OBJECTIVE: - To equip students effectively to acquire skills in reading, writing, comprehension and communication for English language &; Communication.

COURSE OUTCOMES:

- Students will improve their speaking ability in English both in terms of fluency and comprehensibility
- Students will give oral presentations and receive feedback on their performance
- Students will increase their reading speed and comprehension of academic articles
- Students will strengthen their ability to write academic papers, essays and summaries using the process approach.
- Students will enlarge their vocabulary. They will also heighten their awareness of correct usage of English grammar in writing and speaking

Unit I: Communication – Meaning, Types, Channels, Barriers. Skills of Language learning: Listening, Speaking, Reading & Writing.

Unit II: English as a Global Language Growth & Status of English language in India

Unit III: Class-presentation – Introduction, Conversation, Greetings, Likes and Dislikes, Opinion, Agreeing, Disagreeing, Complaint, Apology

Unit IV: Writing skills notice writing, précis writing, essay writing, letter writing resume writing.

Unit V: Vocabulary building: One word substitution, synonyms and antonyms, idioms and phrases, Common Errors, Prefix, Suffix, Homophones, Confusing words

Suggested Reading:

1. Technical Communication, M.H. Rizvi, Tata McGrawhill
2. Everyday Smart English, Dr. Arti Gupta, I.D. Publishers
3. Effective Business Communication, Asha Kaul
4. Developing Communication Skills, Krishnamohan
5. Functional Grammar and Spoken and Written Communication in English, Bikram K. Das, Orient Blackswan
6. Precis, Paraphrase and Summary,P.N. Gopalkrishnan, Authors Press
7. Communication Skills, Sanjay Kumar and Pushplata, Oxford Publication

SEMESTER I

COMMON COURSE –CC 2:Understanding India (1Y4CC-2)

(Credits: 2) Total Marks: 100

Unit I: Background of India's culture: Harappan civilisation and Vedic age Buddhism,Jainism, Sanatan (Hinduism) and Islam

Unit II: Growth and development of Indian Education and literature: Bharat's Natyashastra, Kalidas, Panini, Patanjali Taxila, Nalanda, Vishwa Bharati, BHU, AMU, IIT, IISC, AIIMS

Unit III: Leaders of India's freedom struggle: Mahatma Gandhi, Jawaharlal Nehru, Subhash Chandra Bose, Freedom fighters of Jharkhand (Tilka Manjhi, Sidho-Kanho, , Birsa Munda & Jatra Bhagat)

Unit IV: Geographical features of India

1. India on the map of world and its neighboring Countries.
2. Physical features of India including mountain, plateau, plain, coast, island, vegetation, rivers, soils, and climate

Unit V: The People of India: Racial diversities, Population, its growth, distribution, Migration**.**

Unit VI: Indian Constitution

1. Preamble
2. Salient features
3. Fundamental rights
4. Fundamental duties

Unit VII: Political ideas: Non-violence, Satyagraha and Social Justice

Unit VIII: The Indian Economy: The Indian Economy through the Ages (Agriculture, Industry and Trade-Transport)

Suggested Readings:-

1. L. Basham, A Cultural History of India, Oxford University Press, 1997
2. A. L. Basham, A Wonder that was India, Rupa, New Delhi, 1994
3. N. R. Ray, An Approach to Indian Art, Publication Bureau, Chandigarh, 1974
4. A. L. Basham, A Cultural History of India, Oxford University Press, 199
5. NayanjotLahiri, Marshaling the Past: Ancient India and its Modern Histories, Permanent Black, 2012

6. R.C. Majumdar (ed.), History and Culture of Indian People (Relevant Volumes and Chapters), Bhartiya Vidya Bhawan, Bombay.
7. S. C. Ghosh, History of Education in Modern India, 1758-1986, Orient Longman, Hyderabad, 1995
8. Tirthankar Ray, The Economic History of India 1857-1947, OUP, 2006
9. Vijay Joshi and I.M.D. Little, India's Economic Reforms, 1991-2001, OUP, 1999

SEMESTER I
COMMON COURSE –CC 3:

Health & Wellness, Yoga Education, Sports & Fitness (1Y4CC-3)

(Credits: 2) Total Marks: 100

OBJECTIVE:

- To raise awareness towards fitness among the students.
- To develop the individual as a fit citizen in the society.
- To acquire knowledge about yoga and health &; wellness.

COURSE OUTCOMES:

- Students will understand and learn different dimension of active lifestyle
- Student will learn to apply knowledge and lead better quality life
- The students will be able to continue professional courses and research in health &; wellness &; yoga

HEALTH AND WELLNESS

Unit1:-Introduction

1. Meaning, Definition and Dimensions of Health and Wellness.
2. Factors affecting Fitness and Wellness.
3. Role of Fitness in maintaining Health and Wellness.
4. Importance of Health Education and Wellness.

Unit2:-Methods to Maintain Health and Wellness

1. Role of Physical Activities and Recreational Games for Health and Wellness
2. Role of Yoga asanas and Meditation in maintaining Health and Wellness
3. Nutrition for Health &; Wellness

Unit3:-Anxiety, Stress and Aging

1. Meaning of Anxiety, Stress and Aging
2. Types and Causes of Stress
3. Stress relief through Exercise and Yoga

Suggested Readings:

1. Reklau Marc (2019), “30 Days: Change your habits, Change your life”, Rupa Publications, India
2. Russell, R.P.(1994).Health and Fitness Through Physical Education. USA Human Kinetics.

3. Scates Samantha (2019) " Healthy Habits for a Healthy Life" Samantha, Ireland
4. D.M Jyoti, Yogaand Physical Activities (2015) lulu.com3101, Hillsborough, NC2 7609, United States.

YOGA EDUCATION

Unit -1: Theory

Introduction to Health and Wellness

1. Meaning, definition and importance of Yoga
2. Types of Yoga, Introduction of Sat karma, definition of asana and Pranayama, it's physical and mental benefits
3. Stretching exercises
4. Warming up and limbering down
    a) General warm up exercises
    b) Specific warm up exercises

UNIT II Practical

A. Sukshma Vyayama
B. Suryanamaskara

(12 Poses are Compulsory 1. Ardhachakrasana 2.Padhastasana 3. Ashwasanchalasana 4.Dhandasana. 5 Shasangasana 6.Astangasana 7.Bhujangasana 8.Parvathasana 9. Shashangasana 10. Ashwasanchalasanal 11. Padhastasana 12.Ardhachakrasana)

C. Basic Set of Yoga Asanas -Sitting Poses
Padmasana, Sukhasana, Vajrasana, Gomukhasana,

Prone Position	Supine Position	Invert Position
Noka asang Bhujangasang Salabhasana Marjariasana makarasana	Ustrasana Setu Bandhasana chakrasana	Sarvangasana halasana Salambha Sarvangasana Sirsasana

Relaxing Pose → Shavasana

D. Basic Set of Pranayama, Meditation & Mudra

Pranayama- Anulom-Vilom Pranayama, Bhramari Pranayama, Ujjai Pranayama, Bhastrika Pranayama, Sitali Pranayama

Meditation- Omkar meditation

Mudra – Pranav mudra, Gyan mudra, Hridaya mudra

Suggested Readings:

1. Nagendra, H.R. &; Nagarathna, R. (2002).Samagra Yoga Chikitse. Bengaluru: Swami Vivekananda Yoga Prakasana.
2. Kumar, Ajith. (1984) Yoga Pravesha. Bengaluru: Rashtrothanna Prakashana
3. Shanti KY(1987)& The Science of Yogic Breathier & (Pranayama) DB Bombay
4. Iyengar B.K.S.(2006) " Light on Yoga" Thorsons (Publ.) India

SEMESTER I
INTRODUCTORY REGULAR COURSE (IRC)

(Credits: Theory-02 + Practical 01) Total Marks: 100

Human Physiology (1Y4FNTIRC-1)

COURSE OUT COMES **45 hrs -4hrs/week**

After successful completion of this course, students will be able to:
CO 1. Understand the homoeostatic status of the human body
CO 2. Comprehend the physiological processes and functions of various vital organs as applicable to humannutrition
CO 3. Apply the knowledge of physiological state
therapeutic diets
CO 4. Assess malfunctioning of vital organs or systems

UNIT I (12 hours)
Introduction: Homoeostasis and body fluids. Blood: Red blood cells – Erythropoiesis, stages of differentiation, function, counts, physiological variation. Hemoglobin – structure, function, concentration, physiological variation. White blood cells – production, function, life span, counts, differential counts. Platelets – origin, normal count, morphology, functions. Plasma proteins – production, concentration, types, albumin, globulin, fibrinogen. Clotting factors, mechanism of clotting, disorders of clotting factors. Blood Bank, blood groups. Anticoagulants – examples and uses. Anaemia – classification – morphological and etiological effects of anaemia on body. Blood indices – colour index, MCH, MCV, MCHC. Erythrocyte sedimentation rate (ESR). Blood volume – normal value, determination of blood volume and regulation of blood volume. Lymph – composition and function.

UNIT II (11 hours)

Cardiovascular system: Heart – physiological anatomy, nerve supply, properties of cardiac muscle, cardia

cycle – systole, diastole, conduction system. Cardiac output. Heart sounds: Normal heart sounds, areas of auscultation. Blood pressure – Definition, normal value, clinical measurement of blood pressure. Physiological variations, regulation of heart rate, cardiac shock, hypotension, hypertension, radial pulse. Heart Sounds – Normal heart sounds, characteristics and signification (significance), heart rate. Electrocardiogram (ECG) – significance, coronary, cerebral circulation and capillary circulation

UNIT III (11 hours)
Digestive System: Physiological anatomy of gastro-intestinal tract, functions of digestive system. Salivary glands – structure and functions, deglutition, mastication – stages and regulation of saliva, functions of saliva. Stomach – structure and functions. Gastric secretion – composition, function, regulation of gastric juice secretion. Pancreas – structure, function, composition and regulation of pancreatic juice. Liver – functions of liver. Bile secretion - composition, function, regulation of bile secretion, bilirubin metabolism, types of bilirubin, jaundice – types, significance. Gall bladder – functions. Intestine – small intestine and large intestine. Small intestine - functions, digestion, absorption, movements. Large intestine – functions, Defecation

UNIT IV (11 hours)

Respiratory System: Function of respiratory system - physiological anatomy of respiratory system, respiratory tract, respiratory muscles, respiratory organs – lungs, alveoli, respiratory membrane, stages of respiration. Mechanism of normal and rigorous respiration, intra pulmonary pleural pressure, surface tension. Transportation of respiratory gases: Transportation of O2: direction, pressure gradient, forms of transportation, oxygenation of haemoglobin, quantity of O2 transported. Lung volumes and capacities. Regulation of respiration, mechanisms of regulation, nervous and chemical regulation, respiratory centre. Hypoxia, cyanosis, asphyxia, dyspnoea, dysbarism, artificial respiration, apnoea

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HUMAN PHYSIOLOGY (PRACTICALS)

Course outcome: **36hrs-3hrs/week**

After successful completion of this course, students will be able to:

CO 1. Record blood pressure using various methodsCO 2. Estimate hemoglobin

CO 3. Carry out blood grouping

CO 4. Assess histological sections of various organs

1. Record of blood pressure – Sphygmomanometer, palpatory method, auscultatory method,variation of BP
2. Haemoglobin estimation
3. Blood grouping
4. Histology of Cartilage, bone, adipose tissue, skin, muscle

REFERENCES

- Guyton AC, Hall JE (1996): Textbook of Medical Physiology, 9th Ed., Prism Books Pvt Ltd.,Bangalore
- Chatterjee CC (1988) Human Physiology, Calcutta, WB
- Wilson (1989) Anatomy and Physiology in Health and Illness, Edinburgh Churchill Livingstone
- Sembulingam K, Sembulingam P (2012) Essentials of medical physiology, Jaypee Bros. Medical Publ., New Delhi

Semester - 1

DIGITAL MARKETING – IRVC-2
Course Code: 1Y4IVSDM-1A

(Credits: Theory-01 + Practical 02)

Course Content:

UNIT- I Introduction

1. What is marketing?
2. What is Digital Marketing? Understanding Marketing Process Understanding Digital MarketingProcess
3. Increasing Visibility, What is visibility? Types of visibility, Examples of visibility
4. Visitors Engagement, What is engagement? Why it is important Examples of engagement BringingTargeted Traffic
5. Inbound and outbound marketing
6. Converting Traffic into Leads, Types of Conversion, Understanding Conversion Process ToolsNeeded

UNIT-II Digital Marketing Vs. Traditional Marketing

1. What's the difference between digital marketing and traditional marketing, and why does it matter?
2. Benefits of Traditional Marketing
3. The Downside to Traditional Marketing Benefits of Digital Marketing
4. Why Digital Marketing Wins Over Traditional Marketing? Tools of Digital Marketing
5. How We Use Both Digital & Traditional Marketing

UNIT-III Website Planning Process

1. What is Internet?
2. Understanding domain names & domain extensions Different types of websites
3. Based on functionality Based on purpose
4. Planning & Conceptualising a Website Booking a domain name & web hosting Adding domain nameto web Server Adding webpages & content
5. Adding Plugins
6. Building website using CMS in Class Identifying objective of website Deciding on number of pages required Planning for engagement options Landing Pages & Optimization Creating blueprint of everywebpage Best & Worst Examples

UNIT-IV Search Engine Optimization

1. Understand Search Engines & Google, Google Search Tips & Hacks
2. What is SEO? Introduction to SERP What are search engines? How search engines work
3. Major functions of a search engine What are keywords?
4. Different types of keywords Google keyword planner tool Keywords research process Understandingkeywords mix Long Tail Keywords

SEMESTER I

MAJOR COURSE –MJ 1

FUNDAMENTALS HUMAN NUTRITION (THEORY)

Course outcomes: **45hrs-4 hrs /week**

After successful completion of this course, students will be able to:

CO 1. Comprehend nutritional classification of food and methods of assessing nutritional status and energyrequirements

CO 2. Understand the functions and sources of nutrients

CO 3. Apply the knowledge of human nutrition in maintenance of good health for the individual and thecommunity

CO 4. Assess the factors affecting availability and requirements of nutrients

UNIT I (12 hours)

Introduction to nutrition: Understanding concept of nutrition, nutrients, nutritional status, malnutrition Functions of food, food groups, concept of balanced diet Methods of cooking and preservation of Nutrients Water: Functions, sources and water balance

UNIT II (11 hours)

Macronutrients: Classification, Sources, Functions and Deficiency of Carbohydrates, Dietary Fibre Proteinsand fat

UNIT III (11 hrs)

Energy Metabolism**:** Significance, components, factors influencing body composition, energy metabolism, BMR Measurement methods – Direct and Indirect Energy expenditure in activities, the use of doubly labeled water Influence of energy excess & deficit on body composition – obesity and underweight. Currentmethodology, Recommendations

UNIT IV (11 hours)

Micro nutrients – Sources, Functions and Deficiency: Minerals: Calcium, Phosphorous, Iron, Iodine, ZincFat soluble vitamins (Vitamin A, D, E, K) Water soluble vitamins (B complex vitamins: Thiamine, Pyridoxine (B6), Cyanocobalamin (B12), Riboflavin, Niacin, Folic acid and Vitamin C

FUNDAMENTALS OF HUMAN NUTRITION (PRACTICAL)

Course outcomes: **36 Hrs - 3 hrs/week**

List of Experiments to be conducted

1. Weights and measures
2. Methods of cooking a. Water – boiling, steaming, pressure cooking b. Oil- Shallow frying, deep frying
3. Identification of nutrient rich food
4. Planning and preparation of macro nutrient rich recipes classes a. Energy b. Protein
5. Planning and preparation of micro nutrient recipes a. Iron b. Vitamin A.

REFERENCES

- Guthrie AH (1986) Introductory Nutrition, 6th Ed., The CV Mosby Company
- Swaminathan M (1985) Essentials of food and nutrition, Vol I and II, Ganesh and Co, Madras
- Gopalan C (1991) Nutrition value of Indian foods, ICMR
- WTO Technical Reports Series for Different Nutrients.
- Robinson CH, Lawler MR, Chenoweth WL, Garwick AE (1986) Normal and therapeutic nutrition,17th Ed., MacmillanPubl. Co.
- Agarwal A, Udipi SA (2014) Text book of human nutrition, Jaypee Bros. Medical Publ., New Delhi
- Bamji M, Rao NP, Reddy V (1996) Text book of Human Nutrition, Oxford and IBH Publ. Co. PvtLtd, New Delhi
- Srilakshmi B (2015) Nutrition science - 4th Ed., New age international Publ., New Delhi
- Shills ME, Shike M, Ross AC, Caballero B, Cousins RJ (2005) Modern Nutrition in health anddisease – 10th Ed.,Lippincott Williams and Wilkins
- Raheena Begum., (2009), A Text book of Food, Nutrition & Dietetics, Sterling Publications, New Delhi.
- Mudambi S R and Rajagopal M V., (2008), Fundamentals of Food, Nutrition and Diet Therapy by New AgeInternational Publishers, New Delhi
- Srilakshmi. B., (2009), Human Nutrition, New Age International Publishers

SEMESTER II

Semester	Course Structure For Semester II Common, Introductory, Major, Minor, Vocational & Internship Course						
	Code	**Paper**	**Credits**	**Theory**	**Internal Assessment**	**Practical**	**Total**
II	2Y4CC-4	Language and Communication Skills (Hindi)	6	75	25	--	100
	2Y4CC-5	Mathematical and Computational Thinking Analysis	2	50	25	25	100
	2Y4CC-6	Global Citizenship Education & Education for Sustainable Development	2	50	25	25	100
	2Y4PHY IRC-2	Introductory Regular Course-2 **Bio-Chemistry**	3	50	25	25	100
	2Y4IVS-2B	Introductory Vocational Studies-2 **Digital Marketing -IRVC**	3	50	25	25	100
	2Y4PHY MJ-2	Major paper-2 (Disciplinary/Interdisciplinary Major) **Principal of food science**	6	50	25	25	100

SEMESTER -II

COMMON COURSE –CC 4:

Language and Communication Skills (Hindi) 2Y4CC-4

ह िंदी भाषा

(Credits: 6) अक: 100

इकाई-1 हिन्दीव्याकरण और रचना, संज्ञा, सर्वनाम, हर्शष्ठाण, हिया, अव्यय, कारक, र्चन, सहिय, उपसर्व, प्रत्ययासमास, हिर्हनणवय शब्द ि ोर् शब्द, अनेक शब्दों के हिए एक शब्द, शब्द-शुद्धि, र्ाक्य शुद्धि, मु ि ार्रें ओर ि ोकोहकया, पल्लर्न एर्ं संक्ष पण।

इकाई-2 हनबंध, किा तथा समसामहयक एर्ं राष्ट्र ीय हर्षय पर ि ेखन

इकाई-3 संप्रेषण (संचार)- संप्रेषण की अर्धारण और मित्व, संप्रष्ठाण के हिए आर्श्यक शतव संप्रेषण के प्रकार, संप्रेषण की तकनीक, र्ाचनकिा, समाचारर्ाचन, साक्षात्कारकिा, रचनात्मक ि ेखनका

ि क्ष्य, रचनात्मक ि घु का आधार, भारत की भार् और
अनुशिंहितपुस्तके ं :-

- र् ृ. ितव्याकरणभास्कर डा ृे 0 चवनद कुव मार
- र्ंव तिनबधं ृे ृ् भास्कर डा ृे 0 चवनदर् कु मार

हर्चारो की प्रस्तुहत, र्ाक किा की उपयोि ार्ता।

- आधु िनकि िन्दीव्याकरणऔररचना डा ृे 0 र् ृ ासुद नवन्दनप्रसाद
- रचनामानस प्रो0 राम श्वरनाथितर् ृ ारी
- व्यिावररकि िन्दी डा ृे 0 जंर् बिादुरपाण्ड य
- रचनात्मक खन डा ृे 0 रमश् ृे र् ौतम
- राजिंसि िन्दी िनबंध प्रो0 आर0 एन0 र् ौड़
- सफ ि िन्दी िनबंध रत्न श्वर
- ि नबंध सिचर डा ृे 0 क्ष्मणप्रसाद
- उपकारमहु रव और क हिया ृ ा ृ पार् 0 राज श्वरप्रसादचतर् ेु व दी
- किा िनयोकिाताां ृे की प्रतापअनम
- सम्प्प्र षणपरकि िन्दीभाषा ि शक्षण डा ृे 0 र् ृ ` श्नानारं र्
- श ` ि ज्ञावन डा ृे 0 सुर शकु मार
- श ` ि ज्ञावनप्रितमानऔरिर्श्व षण डा ृे 0 पाडं य शिशभष्े ण „शीताशें ृ् "
- श ` ि ज्ञावनकाइितिास डा ृे 0 पाडं य शिशभष्े ण „शीताशं ृे ृ् "

SEMESTER II
COMMON COURSE –CC 5:

Mathematical and computational Thinking and Analysis (1Y4CC6)

(Credits: 2) Total Marks: 100

Course Learning Outcomes:
This course will enable the students to:
a) Understand the notions of logic and Mathematical Induction.
b) Basic concepts of sets.
c) Analytic approach toward the solution of algebraic equations.
d) Connections of roots and coefficients.
e) Understand basic concept of Probability and statistics
f) Understand and analyze the coordinate systems.

UNIT-1: Logic: statement, truth table, quantifiers, connectives and tautology, Mathematical induction.
UNIT-2: Sets and Number System: operations on sets, Elementary Properties, Decimal system, binary decimal, octal system, hexadecimal system, arithmetic, conversion from binary to decimal and decimal to binary.
UNIT-3: Theory of Equation: Relation between roots and coefficients, Transformation of equation, Symmetric functions of roots, Solutions of cubic and biquadratic equations.
UNIT-4: Statistics and Probability: Data collection and presentation using bar chart, column chart, line chart, pie chart, scatter chart, surface chart. Calculation of frequency. Measure of central tendency, Mean, Median and Mode, Definition of Probability, Elementary properties, addition theorem, multiplication theorem, independent events.
UNIT-5: Geometry: Cartesian, spherical polar and Spherical cylindrical coordinate systems; their interrelationship.
Suggested reading:

1. An introduction to the theory of Numbers, 4th Ed., G. H. HARDY AND E. M. WRIGHT, 1975, Oxford University Press.
2. An Introduction to The Modern Theory of Equations, Florian Cajori, The Macmillan Company ' London: Macmhian & Co., Ltd., 1904.
3. N. K. Singh, A text book of Probability and Statistics, 1st Edition, Pragati Publication, Meerut.
4. Probability and Statistics (4th Edition) 4th Edition, Morris H. DeGroot (Author), Mark J. Schervish, Pearsion Education limited 2014.
5. N. K. Singh, Theory of Equations, 1st Edition, Pragati Publication, Meerut.
6. R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis (3rd Edition), John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.

SEMESTER II

COMMON COURSE –CC 6:

GLOBAL CITIZENSHIP EDUCATION (1Y4CC6)

(Credits: 2) Total Marks: 100
OBJECTIVE:

•To understand the concept and structure of global governance
•To empower learners to become aware of and understand global and sustainable development issues
•To become active promoters of more peaceful, tolerant, inclusive, secure, and sustainable societies.
•Enabling students to embrace and practice constitutional, humanistic, ethical, and moral values in conducting one & life, including universal human values and citizenship values.
•To practice responsible global citizenship required for responding to contemporary global challenges

COURSE OUTCOMES:

•Enhance the capacity of the learners to acquire and demonstrate problem-solving skills involving the capacity to solve different kinds of problems in familiar and non familiar contexts and apply one's learning to real-life situations.
•Promote critical thinking involving capability to apply analytical thought to a body of knowledge, including the analysis and evaluation of policies, and practices, as well analyze and synthesize data related to global issues from a variety of sources and draw valid conclusions and support them with evidence and examples.
•Creativity characterized by the ability to create or think in different and diverse ways, deal with problems and situations that do not have simple solutions; view a problem or a situation from multiple perspectives; think 'out of the box' and generate solutions to complex problems in unfamiliar contexts.
•Communication Skills characterized by skills that enable a person to present complex information in a clear and concise manner to different groups/audiences; express thoughts and ideas effectively in writing and orally and communicate with 3 others using appropriate media, convey ideas, thoughts and arguments using language that is respectful and sensitive to gender and social groups.
•Coordinating/collaborating with others involving the ability to: work effectively and respectfully with diverse teams, facilitate cooperative or coordinated effort on the part of a group, act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

UNIT 1: Global Citizenship Education (GCE) and Education for Sustainable Development
1. Global Citizenship Education; its meaning, characteristics, scope and subject matter emergence and development.
2.Rights and responsibilities of Global citizenship
3.Benefits, Importance and theories of Global Citizenship
4.Global governance – concept and structure
5.Global Citizenship: (a) General idea, (b) Multi cultureless & diversity, (c) tolerance & ;(d) Acharya Vinoba's ideas of 'Jai Jagat.'
UNIT2: Global Poverty, Inequalities and social change

1.Concept of Global Poverty and its impact on World economy
2.Concept of social change, its types and theories.
3.Human Right Education: Special reference to Universal Declaration of Human Rights, 1943
4.Concept of Peace and Security: Special reference to United Nations Charter

UNIT 3: Sustainable Development – Global Issues and Sustainable Issues

1. Global environment Issue-Climate change mitigation and adaptation
2. Sustainable Development: Brief overview
3. Biodiversity loss, Global warming and carbon emission
4. Effect of Global Issue on Human Species
5. Environmental justice

UNIT 4: Citizenship Education & Culture, Globalization

1. Gender equality
2. Meaning of Globalization and its impact of world economy
3. Meaning of culture, crucial factors in the Globalization of culture

Suggested Readings:

1. Global Politics – Rupak Dattagupta
2. Understanding Global Politics – Chanchal Kumar
3. Global Citizenship Education for Young Children – Robin Elizabeth Hancock
4. A New-World Education: The Global Citizen – Roy Andersen
5. Global Citizenship Education, A Critical and International Perspectives Springer – Adeel Jalil, A.K. Kari, Kathrine Meleg
6. Citizenship in a Globalising World – Ashok Acharya
7. Redesign the World: A Global Call to Action – Sam Pitroda
8. Measuring the World – Daniel Kehlmann
9. Global Citizenship Education: Challenges and Successes – Eva Aboagye &amp S. Nomburo Dlamini
10. Global Citizenship Education - William Gaudelli

11. Multiculturalism: A very short Introduction – Ali Rattansi
12. Diversity and Inclusion Matters – Jason Thompson
13. Multiculturalism – C. W. Watson
14. Multiculturalism, Identity and Rights – Bruce Haddock and P

SEMESTER II

INTRODUCTORY REGULAR COURSE (IRC)

BIO-CHEMISTRY (2Y4FNTIRC2)

(Credits: Theory-02 + Practical 01) **Total Marks: 100**

Course Learning Outcomes:

After successful completion of this course, students will be able to:

Course Objectives:

1. Comprehensive study on definition, composition of food, water-food relation, macronutrients, vitamins and flavours.
2. Study of various natural food pigments, enzymatic reactions, changes taking place and new product development and browning reactions in food required at industrial level.

Course Outcomes:

At the end of the Course, students will be able to

CO 1. Define and have an overview on food chemistry including composition and the importance of water.

CO 2. Classify the carbohydrates, lipids, proteins, vitamins and flavour, minerals and natural food pigments used in food products.

CO 3. Apply the knowledge of browning reactions in food products

CO 4. Build own product in innovative way by understanding changes that occurs during food development and use of enzyme technology.

UNIT I (12 hours)

Introduction: Composition of food, water in food, structure of water and ice, types of water, absorption and adsorption phenomenon, Water activity and packaging, Water activity and shelf-life

Lipids: Classification of lipids, Physical properties of lipids. Chemical properties of lipids. Effect of frying on fats, Changes in fats and oils on storage and its prevention, Technology of edible fats and oils - Refining, Hydrogenation and Interesterification, Fat Mimetics

UNIT II (11 hours)

Proteins: Protein classification and structure, Nature of food proteins (plant and animal proteins, Physical and chemical properties of proteins, Functional properties of proteins.

Carbohydrates: Classification of carbohydrates, Structure of important polysaccharides, Chemical reactions of carbohydrates, Modified celluloses and starches.

Flavours: Definition and basic tastes, Description of food flavours, Flavour enhancers

UNIT III (11 hours)

Minerals: Major and minor minerals, Metal uptake in canned foods, Toxic metals

Natural Food Pigments: Introduction and classification, Water soluble and insoluble food pigments (chlorophyll, carotenoids, anthocyanins and flavonoids, beet pigments)

Browning Reactions in Food: Browning, Maillard reaction, Caramelization reaction.

UNIT IV (11 hours)

Enzymes: Introduction, General characteristics, Enzymes in food processing, Industrial Uses of Enzymes, Immobilized enzymes

Changes occurring during food processing treatments: Drying and dehydration, Irradiation, Freezing, Canning

New product development: Definition, importance, need of product development, steps of product development, tools.

References:

1. Fennema,
Owen R, Food Chemistry, 3rd Ed., Marcell Dekker, New York, 1996
2. Whitehurst
and Law, Enzymes in Food Technology, CRC Press, Canada, 2002
3. Wong,
Dominic WS, Food Enzymes, Chapman and Hall, New York, 1995
4. Potter, N.N.
and Hotchkiss, J.H, Food Science, 5th Ed., Chapman & Hall, 1995
5. DeMan, J.M.,
Principles of Food Chemistry, AVI, New York, 1980
6. DeMan, J.M.,
Principles of Food Chemistry, 3rd Ed., Springer 1999
7. Desrosier,
Norman W. and Desrosier., James N., The technology of food preservation, 4th Ed., Westport, Conn.: AVI Pub. Co, 1977.
8. Fuller, Gordon
W, New Product Development from Concept to Marketplace, CRC Press, 2004.
10. Whitehurst
and Law, Enzymes in Food Technology, CRC Press, Canada, 2002
11. Krishna
Prasad Nooralabettu. Enzyme Technology, Pace Maker of Biotechnology, PHI Learning Private Limited, New Delhi. 2011.

BIO-CHEMISTRY PRACTICAL (2Y4FNTIRC2P

Course Title	**Nutritional Biochemistry - I (Practical)**	Practical Credits	**2**

Content of Practical

1. Qualitative analysis for carbohydrates - Glucose, Fructose, Maltose, Lactose, Sucrose,Starch and Galactose
2. Quantitative analysis in blood and serum - Blood glucose
3. Quantitative analysis in blood and serum - Cholesterol
4. Quantitative analysis in blood and serum - Urea
5. Enzymes – effect of pH on human salivary α-amylase activity
6. Qualitative test for minerals
7. Quantitative estimation of Ascorbic acid using any two different samples
8. Preparation of ash solution
9. Quantitative estimation of Calcium using any two different samples
10. Quantitative estimation of Phosphorus using any two different samples
11. Quantitative estimation of Iron using any two different samples
12. Estimation of Calcium from types of milk

Semester - 2

DIGITAL MARKETING – IRVC-2
Course Code: 2Y4IVSDM-1B

(Credits: Theory-01 + Practical 02)

Theory: 15 Lectures

Course Content:

UNIT- I Social Media Marketing-I

1. What is Social Media?
2. Understanding the existing Social Media paradigms & psychology
3. How social media marketing is different than others
4. Forms of Internet marketing Facebook marketing Understanding Facebook marketing

UNIT- II Social Media Marketing-II

1. Linkedin Marketing What is LinkedIn? Understanding LinkedIn
2. Company profile vs Individual profiles Understanding Linkedin groups
3. How to do marketing on LinkedIn groups Linkedin advertising & it's best practices Increasing ROI from LinkedIn ads Linkedin publishing
4. Company pages Adv on linkedIn Display vs text Twitter Marketing
5. Understanding Twitter
6. Tools to listen & measure Influence on Twitter: Tweet Deck, Klout, Peer Index

UNIT- III Google Analytics

1. Introduction to Google Analytics
2. How Google analytics works
3. Understanding Google analytics account structure
4. Understanding Google analytics insights
5. Understanding cookie tracking
6. Types of cookie tracking used by Google analytics
7. Starting with Google analytics
8. How to set up analytics account
9. How to add analytics code in website
10. Understanding goals and conversions
11. How to setup goals

UNIT- IV Google Adwords & Online Display Advertising

1. Google AdWords Overview
2. Understanding inorganic search results

3. Introduction to Google Adwords & PPC
4. advertising
5. Overview of Microsoft Adcenter (Bing & Yahoo)
6. Setting up Google Adwords account
7. Understanding Adwords account structure
8. Campaigns, Adgroups, Ads, Keywords, etc
9. Types of Advertising campaigns- Search,
10. Display, Shopping & video

DIGITAL MARKETING PRACTICAL- IRVC-2
Course Code: 2Y4IVSDM-1B-LAB

PRACTICALS: **60 Lectures**

1. How to do marketing on Twitter
2. Black hat techniques of twitter marketing
3. Advertising on Twitter
4. Creating campaigns
5. Types of ads
6. Tools for twitter marketing
7. Twitter Advertising
8. Twitter Cards
9. Using youtube for business
10. Developing youtube video marketing
11. Strategy
12. Bringing visitors from youtube videos to your website
13. Creating Video A Dgroups

SEMESTER II

MAJOR COURSE- MJ 2:

PINCIPAL OF FOOD SCIENCE (2Y4PHYMJ2)

(Credits: Theory-04, Practicals-02) **Theory: 60 Lectures**

Course Outcomes:

After successful completion of this course, students will be able to:

CO 1. Apply basic nutrition knowledge in making foods choices and obtaining an adequate diet

CO 2. Learn to distinguish and relate the characteristics and properties of foods

CO 3. Apply the knowledge gained on characteristics and properties of foods during cooking

CO 4. Develop appropriate food preparation and processing methods to ensure quality standards

UNIT I (12 hours)

Introduction to Food Science: Properties of food (a) Colloids, sols, gels, foam (b) Emulsion formation (c) Bound and free water (d) pH value, osmosis and osmotic pressure (e) Boiling, melting and freezing points. Sensory evaluation - Subjective and objective. Cereals and millets - Production, importance & composition - cereal products. Wheat, rice maize, ragi and sorghum. Malting and cooking of cereals, non-enzymatic reactions, leavening agents. Fermented products, milling of wheat, parboiling of rice, pulses- composition, toxic constituents and cooking of pulses, variety and processing

UNIT II (11 hours)

Fruits and vegetables – Production composition, pigments, flavors and variety- changes during cooking- enzymatic browning, non-enzymatic browning. Milk and milk products- composition, storage- Processing of milk – Effects of heat on milk protein - Milk products available in India. Egg - structure, composition, storage, grade, evaluation, selection, Role of egg in food preparation, factors affecting coagulation of egg proteins.

UNIT III (11 hours)

Sugar, Jaggery and honey - Composition, different forms of sugar, storage- Behaviors of syrups at different temperatures- Crystallization and caramelization Oil and Fats- Composition, types, storage, plasticity, Hydrogenation and processing .Changes during heating- Fats as shortening agents, smoking point, Rancidity, specific fat (Lard, Butter, Margarine) Meat, Fish poultry-structure, composition, storage, Post mortem changes in meat, Curing of meat, Tenderization, Aging of meat, selection, Meat cookery

UNIT IV (11 hours)

Concepts of food safety and standards. Food Preservation, food spoilage, method of preservation by low temperature, high temperature, dehydration, food irradiation.

PRINCIPLES OF FOOD SCIENCE AND PRESERVATION (PRACTICAL)

36 Hrs - 3 hrs/week

List of Experiments to be conducted

1. Weights & measures, standardization of common food preparation.
2. Sensory evaluation
3. Starch cookery I-microscopic observation of different starches gel formation and gelatinization.
4. Starch cookery II- Rice and Wheat preparation, factors influencing dough 20 development, gluten formation.
5. Leavened products, milk cookery-casein formation, curd setting.

6. Fermented products and pulse cookery.
7. Vegetable cookery- Effect on pigments and enzymatic browning in fruits and vegetables
8. Egg cookery and fat and oil cookery.
9. Sugar and Jaggery- Syrup formation, crystallization and caramelization.

REFERENCES

- Manay NS, Shadaksharaswamy M (2010) Foods - Facts and principles, New Age International Publ.,New Delhi
- Levies (1988) Food commodities, Heinemann Ltd., London
- Hughes and Benniion M (1970) Introductory Foods, Macmillan and Co, New York Dowell P, Bailey A (1980) TheBook of ingredients, Dorling Kindersley Ltd., London
  Roseville LJ, Viera ER (1992) Elementary food science, 3rd Ed., Chapman and Hall, New YorkCharleyH (1982) Food Science, 2nd Ed., John Wiley and Sons.
- Potter NN, Hotchkiss JH (1966) Food Science, 5th Ed, CBS Publisher and Distributors, Delhi
- Frazier WC, Westoff DC (1998) Food Microbiology 4th Ed., Tata Mc Graw Hill Publ. Co. Ltd
- Prescott SC, Proctor BE (1937) Food Technology, McGraw Hill
- Desroier NV (1963) The technology of food preservation, AVI Pub. Co
- Lal G, Siddappa GS, Tandon GL (1960) Preservation of food and vegetables, ICAR, New Delhi
  Manay NS,Shadaksharaswamy M (2010) Foods - Facts and principles, New Age International Publ., New Delhi

SEMESTER III

Semester	Course Structure For Semester III Common, Introductory, Major, Minor, Vocational & Internship Course						
	Code	**Paper**	**Credits**	**Theory**	**Internal Assessment**	**Practical**	**Total**
III	2Y4EVSCC-7	Environmental Studies/EVS	3	50	25	25	100
	2Y4CC-8	Digital Education (Elementary Computer Applications)	3	50	25	25	100
	2Y4CC-9	Community Engagement & Service (NSS/NCC/Adult education)	3	50	25	25	100
	3Y4FNTIRC-3	Introductory Regular Course-3 **Basic of food science**	3	50	25	25	100
	3Y4IAP	Internship/Apprenticeship/Project	4	50	25	25	100
	3Y4PHYMJ-3	Major paper-3 (Disciplinary/Interdisciplinary Major) **Lifespan Nutrition**	6	50	25	25	100

SEMESTER III

Environmental Studies (Course Code: 3Y4CC7)

(Credits: Theory-2 credit + Field Work-1 credit = 3credits)

Course Objectives:

The course will seek to achieve the following objectives:

1. Generating the awareness about environmental problems among people and society.
2. To clarify modern environmental concept like how to conserve biodiversity.
3. Inculcating basic knowledge about the environment and its allied problems.
4. Developing an attitude of concern for the environment.
5. Motivating public to participate in environment protection and environment improvement.
6. Acquiring skills to help the concerned individuals in identifying and solving environmental problems.
7. Striving to attain harmony with Nature.

Course Learning Outcomes:

At the end of the course students will be able to:

1. Know the more sustainable way of living.
2. Use natural resources more efficiently.
3. Know the behaviour of organism under natural conditions.
4. Know the interrelationship between organisms in populations and communities.
5. Aware and educate people regarding environmental issues and problems at local, national and international levels.

Unit 1: Introduction to environmental studies

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

(2 lectures)

Unit 2: Ecosystems

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems:

a) Forest ecosystem
b) Grassland ecosystem
c) Desert ecosystem
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) **(8 lectures)**

Unit 3: Natural Resources: Renewable and Non-renewable Resources

- Land resources and land use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over-exploitation of surface and ground water, floods, droughts conflicts over water (international & inter-state).
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

(10 lectures)

Unit 4: Biodiversity and Conservation

- Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots
- India as a mega-biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

(10 lectures)

Unit 5: Environmental Pollution

- Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste.
- Pollution case studies.

(9 lectures)

Unit 6: Environmental Policies & Practices

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

(10 lectures)

Unit 7: Human Communities and the Environment

- Human population growth: Impacts on environment, human health and welfare.
- Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management: floods, earthquake, cyclones and landslides.
- Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.

- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g. CNG vehicles in Delhi).

(6 lectures)

Environment Studies Field Work

- Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
- Visit to a local polluted Site-Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems-pond, river, spring, etc.

(Equal to 10 lectures)

References:

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California
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5. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
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7. Sunderland: Sinauer Associates, 2006.
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12. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
13. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
14.]Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
15. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
16. Rosencranz, A., Divan, S., & Noble, M.L. 2001. Environmental law and policy in India. Tripathi 1992.
17. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.

18. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
19. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
20. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
21. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
22. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
23. World Commission on Environment and Development. 1987. Our Common Future. Oxford University

SEMESTER III

Digital Education (Elementary Computer Application)

Course code: 3Y4DECC8

Credits: 03

Course Objectives:

This course is specially designed for better understanding of digital education in India. The course has been designed to introduce key concepts in digital education to the students to sharpen their understanding of importance and significance of digital education in India. The students need to develop a critical thinking about the development of India in the background of expanding digital networks and our constant dependence on them in our day-to-day life.

Learning Outcome:

- Students will understand the meaning of digital education and its importance.
- They will be able to focus on different digital platform, its utility and its applications.
- The students will be exposed to different tools of digital education available in India.
- They will understand the importance of E-Learning in the changing context of Digital India.
- They will come to know about their responsibility as citizen in digital growth in India.

UNIT I: Introduction to Digital Education 5 Classes

Meaning & Evolution of Digital Systems. Role & Significance of Digital Technology, digital education vs traditional education, advantages and disadvantages of digital education.

UNIT II: Digital Education Tools (10 Classes+ 5 Hands on Sessions)

Information & Communication Technology & Tools Interactive tools- Microsoft Teams, Google Classroom, Linkedin Creative Tools - Google Slides, Google Spreadsheets, Google form, Youtube)

UNIT III: Digital Education in India (10 Classes + 5 Hands on Sessions)

Government initiatives for Digital education in India: SWAYAM, E-Pathshala, National digital library of India (NDL India), DigiLocker. Advantages & challenges in digital education in India.

UNIT IV: E- Governance 10 Classes)

Introduction of E-Governance in India, Types of E-Governance-G2C (Government to Citizen), G2E (Government to Employee), G2B (Government to Business), G2G (Government to Government), E – Governance in Jharkhand.

Suggested Readings:

1. E-Governance in India: Initiatives and issues by R.P.Sinha
2. Information & Communication Technology (ICT) in Education by Dr. Vanaja M,Dr. S Rajasekar, Dr. S. Arulsamy.
Digital India: Understanding Information, Communication and Social Change byPradip N.

References:

1. www.slideshare.net
2. www.lisportal.com/en/lis-blog

SEMESTER III

COMMUNITY ENGAGEMENT NCC/NSS
Course code (1Y4CC6)

Total Marks: 100

Course Objectives

Understand the community in which they work and their relation, Identify the needs and problems of the community and involve them in problem-solving, develop capacity to meet emergencies and natural disasters, Practice national integration and social harmony and, Utilize their knowledge in finding practical solutions to individual and community problems.

Course Outcomes

- To impart hands-on skills in preparation, In the end of the paper, a student should be able to: - Understand the importance of having community problems and their solutions. It might help in job opportunities in some government approved NGOs, andministry of youth affairs and sports. The students can carry out basic information about the community, which in turn will be of great help in disaster management fields. Students can also go for social community courses, opening opportunities in different social activity related departments.

Unit-I: NSS:

- Introduction, Origin and growth of NSS, Objectives, Motto, Symbol, NSS, Import National Days, NSS Song, Environmental Awareness : Natural Resources – Conservation and Management, Water conservation and Rain water harvesting, Solid waste management, Pollution control: Water, Air, Noise and Soil; Energy conservation-Wildlife Conservation, Global warming.

Unit-II: Special Programme:

- Legal Awareness – Health awareness –Blood Donation Camp, First –Aid –Career Guidance – Leadership. Training cum –Cultural Programme –Globalization ant its Economic Social and Cultural Impacts. Planning and Preparation of special Camping Programme. Planning at institutions level – Guidelines for the success of camp-Importance of successful camping programme – Guiding principles – organization of camp – Administration of camp.

Unit-III: Social Awareness:

- Basics and Social Service, Weaker Section of our society and their needs – NGOs : Role and Contribution –Civic responsibility – causes and Prevention; role of y uth – Drug Abuse and Trafficking –awareness of IV / AIDS.. National Integration : Impo tance and Necessity – Freedom Struggle and Nationalistic movement in India –National interests, Objectives, Threats and Opportunities – Unity in Diversity – Contribution of Youth in Nation Building.

Unit-IV: First Aid:

- Artificial Respiration – Control of Bleeding – Fractures – Burns – Shock – Wounds – Eye Injures – Heat Stroke – Snake Bite – Dog Bites – Poisoning., Disaster Management : Characteristics and types of Disasters (Geological and Mountain Area Disaster , Wind and Water Related natural Disaster, Man-made Disaster) , Causes and effects, Assistance during Natural / Other Calamities Flood / Cyclone / Earth Quake / Accident etc..

Unit-V: N.S.S. Regular Activities

- NSS Programme Officer – NSS Volunteer – Community – Aims of NSS Programme /Activities – Classification of NSS Programme – Adoption of Villages – Contacting Villages / Area Leaders – Survey of the Villages / Area Identification of Problem(s) Completion of Projects – Evaluation of Project – Adoption of Slums – Survey of the Slum – Services in Slums - Coordination with Voluntary – Organizations.

REFERENCES:

1. National Service Scheme Manual (Revised) 2006, Government of India, Ministry of Youth Affairs and Sports, New Delhi.
2. University of Mumbai National Service Scheme Manual 2009.
3. Avhan Chancellor & Brigade-NSS Wing, Training camp on Disaster Preparedness Guidelines, March 2012.
4. Rashtriya Seva YojanaSankalpana- Prof. Dr. SankayChakane, Dr. Pramod Pabrekar, Diamond Publication, Pune.
5. National Service Scheme Manual for NSS District Coordinators, National Service Scheme Cell, Dept. of Higher and Technical Education, Mantralaya,
6. Annual report of National Service Scheme (NSS) published by Dept. of Higher and Technical Education, Mantralaya,
7. NSS Cell, Dept. of Higher and Technical Education, Mantralaya, UTKARSHA- Socio and cultural guidelines.
8. Case material as a Training Aid for Field Workers, Gurmeet Hans.
9. Social service opportunities in hospita's, Kapil K. Krishnan, TISS
10. New Trends in NSS, Research papers published by University of Pune.
11. ANOOGUNJ Research Journal, published by NSS Unit C. K. Thakur college
12. Training Manual for Field Work published by RGNIYD, Shreeperumbudur
13. Prof. Ghatole R.N. Rural Social Science and Community Development.
14. PurushottamSheth, Dr. Shailaja Mane, National Service Scheme

Related Online Contents:

1. https://en.wikipedia.org/w/index.php?search=National-service- scheme & title=Special%3ASearch&fulltext=1&ns0=1
2. https://nss.gov.in
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4. https://twitter.com/nssybnuranchi2
5. https://www.facebook.com/profile.php?id=100083943787477

SEMESTER III

INTRODUCTORY REGULAR COURSE (IRC)

BASIC FOOD SCIENCE(2Y4FNTIRC2)

(Credits: Theory-02 + Practical 01) **Total Marks: 100**

1. Basic concept on Food, Nutrition and Nutrients. Classification of Food, Classification of Nutrients.

2.Carbohydrates - Definition, Classification, Structure and properties.

Monosaccharides - glucose, fructose, galactose.

Disaccharides - Maltose, lactose, sucrose

Polysaccharides - Dextrin, starch, glycogen, resistant starch.

Carbohydrates - Sources, daily requirements, functions. Effects of too high and too Low carbohydrates on health. Digestion and absorption of carbohydrate.

3. Lipids -Definition, Classification & Properties. Fatty acids-composition, properties, types. Lipids - sources, daily requirements, functions. Digestion & Absorption of nutrients. Role & nutritional significances of PUFA, MUFA, SFA, W-3 fatty acid.

4. Proteins- Definition, Classification, Structure & properties.

Amino acids Classification, types, functions. Proteins - Sources, daily requirements, functions.

Effect of too high - too low proteins on health. Digestion & absorption. Assessment of Protein quality (BV, PER, NPU). Factors affecting protein bio-availability including anti-nutritional factors.

5. Dietary Fibre-Classification, sources, composition, properties & nutritional significance

6. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)

7. Vitamins - Biochemical and Physiological role, Bio-availability and requirements, sources, deficiency & excess (Fat soluble and water-soluble vitamins), Provitamin, Antivitamin, Pseudo vitamin and Vitamers.

8. Water - Functions, daily requirements, Effect of excess and deficiency. Water balance.

BASIC FOOD SCIENCE I (PRACTICAL) (1 CREDIT)

1. Identification of Mono, Di and polysaccharides

2. Identification of Proteins

3. Identification of glycerol

4. Determination of Ash content in food

5. Determination of Moisture content in food

6. Determination of calcium, iron, and Vitamin C content in foods.

REFERENCE BOOKS-

1. SrilakshmiB(2017): Nutrition Science,6th Multicolour Ed. New Age International (P) Ltd.

2. RodayS(2012): Food Science and Nutrition, 2nd Ed. Oxford University Press.

3. Mann J and TruswellS(2017) : Essentials of Human Nutrition, 5th Ed. Oxford University Press.

4. Wilson K and Walker J(2000): Principles and Techniques of Practical Biochemistry, 5th Ed. Oxford University Press.

5. Sadasivan S and ManikamK(2007): Biochemical Methods, 3rd Ed. New Age International (P) Ltd.

6. Oser B L(1965). Hawk's Physiological Chemistry, 14th Ed. McGraw-Hill Book

7. Nath RL and NathRK(1990). Practical biochemistry in clinical medicine, 2nd Ed. Academic Publishers.

8. Sen AR, Pramanik NK and Roy SK(2001): A treatise on analysis of food fat and oil, Oil

Technologists Association of India (EZ), Kolkata, 76, 119.

9.Plummer D(2017): An introduction of Practical Biochemistry, 3rd Ed. McGraw Hill Education.

10.SwaminathanM(2007): Essentials of Food and Nutrition(Vol. I & II), 2nd Ed. Bappco.

11.Meyer LH (2004): Food Chemistry, CBS Publishers & Distributors

SEMESTER III

MAJOR COURSE- MJ3: LIFESPAN NUTRITION

COURSE CODE: (3Y4FNTMJ3)

(Credits: Theory-04, Practicals-02)

Course Outcomes:

Unit–1	15
Basic principles of meal planning: Explanation of terms: Health, RDA, Adequate intake, Balanced diet. Food exchange list, food guide pyramid. Vegetarian diets - classification of vegetarianism. Quality of various nutrients - proteins, fats, minerals, vitamins, fibres and antioxidants. Principles of planning meals. Factors affecting meal planning	
Unit -2	15
Nutrition during infancy: Growth and development. Use of growth chart to monitor development Advantages of breast feeding. Nutrition factors of human milk. Difference between human and anima milk. Artificial feeding. Factors to be considered in bottle feeding. Feeding problems. Nutritiona requirements. Weaning: Need and use. Points to be considered in introducing weaning foods. Problems in weaning. Types of supplementary foods	
Unit -3	15
Nutritional needs for children: Pre School - Factors to be considered in planning meals for preschoo children. Factors affecting nutritional status. Pica. Dietary guidelines. Nutritional requirements. Die planning School children - Meal planning for school children. Feeding problems. School lunch programmes. Factors affecting feeding programmes. Nutritional requirements. Nutritional needs for adolescents: Special needs for girls during menarche - Food habits. Dietary guidelines Nutritional problems- obesity, eating disorder, osteoporosis, anaemia, under nutrition, premenstrua syndrome, PCOD. Nutritional requirements.	

FOOD AND NUTRITION PRACTICAL- MJ3
LAB:

PRACTICALS:

Planning, preparing and calculating the major nutrients of the following (Two planned diets with different age groups)

1. Nutritive Recipes for weaning
2. Diet planning for Infancy- 6-8 months and 9-12 months
3. Use and interpretation of Growth Charts- WHO Growth Charts
4. Diet planning for Toddlers- (1-3 years)
5. Diet planning for Preschool Child- (4-6 years)
6. Diet planning for School going Child-(7-9 years and 10-12 years)
7. Nutritive Recipes for snacks and packed lunches
8. Diet planning for Adolescents (13-15 years and 16-18 years)

REFERENCE BOOKS

- Elizabeth, K. E. (2022). Nutrition and child development,6th Ed., Paras Medical Publisher, Hyderabad.
- Joshi AS. (2021). Nutrition and Dietetics, 5th Ed. McGraw Hill, Noida
- Srilashmi B. (2019). Dietetics, 8th Ed., New Age International Publishers., New Delhi
- Mudambi SR, Rajgopal MV. (2020). Fundamentals Of Foods, Nutrition And Diet Therapy, 6th Ed.,New Age International Publishers., New Delhi
- Agarwal A, Udipi SA. (2013). Textbook Of Human Nutrition., 1st Ed., Jaypee Brothers Medical Publishers, New Delhi
- Mahan K L, Escott-Stump S (2012) Krause's Food and the Nutrition Care Process, 13th Ed., Elsevier,

SEMESTER IV

Semester	Course Structure For Semester IV Common, Introductory, Major, Minor, Vocational & Internship Course						
	Code	**Paper**	**Credits**	**Theory**	**Internal Assessment**	**Practical**	**Total**
IV	4Y4FNT MJ-4	Major paper-4 (Disciplinary/Interdisciplinary Major) **THERAPEUTIC NUTRITION**	6	50	25	25	100
	4Y4FNT MJ-5	Major paper-5 (Disciplinary/Interdisciplinary Major) **LIFESPAN NUTRITION -2**	6	50	25	25	100
	4Y4FNT MN-1	Minor paper-1 (Disciplinary/Interdisciplinary Minor) **DIETETICS-1**	6	50	25	25	100
	4Y4VS-1	Vocational Studies-1 (Minor) **Introduction to Stock Market**	4	50	25	25	100

SEMESTER IV

MAJOR COURSE- MJ 4 THERAPEUTIC NUTRITION

COURSE CODE: 4Y4FNTMJ4

(Credits: Theory-04, Practicals-02)

Course Outcomes:

Course Outcomes:

After the successful completion of the course, the student will be able to:

CO 1. Understand the role of the dietician in preventive, promotive and curative health care CO 2. Appropriate dietary modification for various disease conditions based on physiology

CO 3. Interpret the role of the dietician through dietary management in disorders associated with pancreas, liver and gall bladder.

CO 4. Assay the role of dietician through dietary management in kidney dysfunction

CONTAN OF THERORY **60**

Unit–1	8
Definition of metabolic disorders. Definition of Diabetes mellitus. Classification and types – IDDM, NIDDM, Gestational Diabetes and MRDM, impaired Glucose tolerance (IGT), Prediabetes, MODY. Insulin resistance. Aetiology and symptoms. Diagnosis tests – Urinary sugar test, Glycosuria, Ketonuria RBS, OGTT, Glycosylated Hemoglobin test (HbAlc). Metabolism. Complications in diabetes - Acute complication, hypoglycaemia, hyperglycaemia, ketoacidosis; Chronic complications –heart disease, diabetic retinopathy, diabetic nephropathy, diabetic neuropathy, infections and wound healing. Treatment – biochemical criteria: urine sugar testing and blood glucose monitoring. Drug therapy – commonly used hypoglycaemic drugs, Insulin and its types. Management of diet in Diabetes – objectives, factors to be considered for planning diabetic diet, macronutrients, micronutrients, dietary fiber, foods permitted/avoided. Glycemia index (GI): definition, formula for GI, factors affecting GI, glycaemic indices of some common foods, Glycaemic load. Special concerns – alcohol, hypoglycaemia, illness or sick days, travel, eating out, stress. Diabetes and physical activity. Artificial sweeteners – low calorie sweeteners and non-calorie sweeteners. Dietary guidelines	
Unit -2	8
Functions of liver. Agents responsible for liver damage. Damage caused to the liver. Malnutrition in liver disease. Infective hepatitis: definition, viruses responsible for hepatitis, aetiology for acute and chronic hepatitis. Dietary management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Cirrhosis of liver. Definition, aetiology, symptoms. Pathogenesis of alcoholic liver disease (ALD). Complications – ascites, portal hypertension, oesophageal varices, hepatic coma: Dietary management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Hepatic coma – Definition, aetiology, symptoms. Clinical stages: Dietary management – objectives and recommendations.	
Unit -3	6

Gall bladder diseases: terms – cholestasis, cholelithiasis, cholecystitis, cholecystectomy, biliary sludge. Functions of gall bladder. Cholecystitis – definition, types – acute and chronic phases, risk factors. Types of gallstones – Cholesterol stones, pigment stones and mixed stones. Dietary management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Pancreatitis – definition, clinical features. Acute pancreatitis – aetiology, symptoms, complications and dietary management. Chronic pancreatitis – aetiology, symptoms, dietary management, special considerations and guidelines.

Unit -4	8

Functions of the kidney. Glomerulonephritis (Nephritis) – acute and chronic: definitions, causes, symptoms and metabolic changes. Dietary management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Renal failure – acute and chronic – definition, causes, symptoms and metabolic changes. Dietary management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Nephrotic syndrome – definition, symptoms, metabolic changes. Dietary management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Urolithiasis (Kidney stones / uremia) – definition, causes, symptoms, types of kidney stones. Dietary management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Dialysis – definition, types of dialysis. Dietary management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed.

Unit-5	**8**

Diseases of the Cardiovascular system: Definition of coronary heart disease (CHD) - Clinical features and Risk factors - modifiable and non-modifiable. Common disorders of Coronary heart disease: Dyslipidaemia/ hyperlipidaemia/ hypercholesterolemia - Definition, classes of lipoproteins and other parameters in CHD, aetiology, symptoms - xanthoma, complications. Dietary management- objectives, macronutrients, micronutrients, foods allowed/ not allowed. Atherosclerosis - Definition, aetiology, Role of fat in the development of atherosclerosis - Cholesterol, Saturated fatty acids, Trans fatty acids, Physical activity and heart diseases. Functional foods. Dietary guidelines. Hypertension: Definition, classification and stages. Pathogenesis, aetiology, symptoms, complications. Dietary management- objectives, macronutrients, micronutrients, foods allowed/ not allowed, High and low sources of sodium. Lifestyle modifications to manage hypertension; Dietary Approach to Stop Hypertension (DASH)

Unit -6	8

Cancer: Definition, Steps in development of cancer, characteristics of cancer, tumours - benign and malignant. Classification of malignant tumours. Risk factors, dietary and non- dietary factors. Symptoms of specific cancers. Metabolic alterations and its associated nutritional problems. Carcinogenic foods. Role of food in the prevention of cancer. Nutrition problems of cancer therapy. Feeding problems in cancer patients. Dietary management - objectives, macronutrients, micronutrients.

Unit -7	6

Genetic and metabolic disorders: Definition of metabolic disorders. Gout - definition, aetiology, metabolic changes, clinical features and symptoms, Dietary management- objectives, macronutrients, micronutrients, foods allowed/ not allowed. Inborn errors of metabolism. Galactosemia – Definition, metabolic changes, diagnosis, Aetiology and dietary management -

objectives, macronutrients, micronutrients, galactose containing foods and low galactose foods.	
Unit -8	8
Genetic and neurological disorders: Phenylketonuria (PKU) - Definition, aetiology, metabolic changes, diagnosis, Prognosis, Dietary management- objectives, macronutrients, micronutrients, low phenylalanine foods, PKU formulae. Neurologic disorders- nutritional and non-nutritional. Epilepsy – definition, aetiology, clinical features. Dietary Management- Ketogenic diet- mechanism of the diet, short term and long term side effects, foods allowed and not allowed	

THERAPEUTIC PRACTICAL- MJ4

Course Title	**Therapeutic Nutrition I (Practical)**	Practical Credits	**2**

Course Outcomes:

After successful completion of this course, students will be able to:

CO 1. Plan, prepare and calculate major nutrients in therapeutic nutrition CO 2. Carry out the 24 hrs recall method

CO 3. Formulate diet for Diabetes mellitus and kidney dysfunction/renal disease

CO 4. Prepare diets for pancreatic and gall bladder disease

Content of Practical

Planning, preparing and calculating the major nutrient of the following (2 case studies)

1. 24 hrs recall method
2. Diabetes mellitus
3. Liver disease
4. Renal disease
5. Pancreatic disease
6. Gall bladder disease
7. Cardiovascular diseases- atherosclerosis
8. Dyslipidemia
9. Hypertension
10. Cancer
11. Phenylketonuria
12. Galactosemia
13. Epilepsy

REFERENCE BOOKS –

- Anderson L, Dibble MV, Turkki PR, Mitchall HS, Rynbergin HJ (1982) Nutrition in health and disease, 17th Ed., JB Lippincott and Co., Philadelphia
- Antia FP (1973) Clinical dietetics and nutrition, 2nd Ed., Oxford Univ. Press, Delhi
- Williams SR (1989) Nutrition and diet therapy, 6th Ed., Time, Mirror, Mosby College Publ., St Louis
- Raheen Begum (1989) A textbook of foods, nutrition and dietetics, Sterling Publ., New Delhi
- Joshi SA (1992) Nutrition and dietetics, Tata McGraw Hill Publications, New Delhi

Srilakshmi B (2011) Dietetics, 6th Ed., New Age International Publ., New Delhi

SEMESTER IV

MAJOR COURSE- MJ 5: LIFESPAN NUTRITION-2

COURSE CODE: 4Y4FNTMJ5

(Credits: Theory-04, Practicals-02)

Course Outcomes:

Course Pre-requisite(s): Certificate with minimum 45%	
Course Outcomes (COs): After successful completion of this course, students will be able to: CO 1. Understand the process of growth and development and the concept of growth promotion CO 2. Comprehend nutritional needs at different stages of growth. CO 3. Evaluate nutritional needs during pregnancy and lactation CO 4. Apply nutritional requirements for the aged taking their physiology into account	
Content of Theory	**45 Hrs**
Unit–1	15
Nutritional needs of adults: Reference man and reference woman in relation to occupation. Dietary guidelines to reduce the cost of a meal. Nutritional requirements.	
Unit -2	15
Nutrition during pregnancy: Normal growth and weight gain. Physiological changes. Dietary modifications. General dietary problems. Complications during various stages of pregnancy. Nutritional requirements. Diet planning Nutritional needs during lactation: Physiology of lactation. Milk output and factors affecting it. Dietary guidelines. Nutritional requirements. Diet planning	
Unit -3	15
Nutritional needs during old age: Physiological changes, RDA, Nutritional guidelines, nutritional, health concerns & complications and their management. Dietary modifications. Factors contributing to longevity	

LIFESPAN NUTRITION PRACTICAL –MJ 5

Life span Nutrition - II (Practical)
Content of Practical
Planning, preparing diets and calculating the major nutrients of following (Standard with two planned diets of different calories and activities) 1. Adult 2. Pregnancy 3. Lactation 4. Old age

References book -
• Elizabeth, K. E. (2022). Nutrition and child development,6th Ed., Paras Medical Publisher, Hyderabad. • Joshi AS. (2021). Nutrition and Dietetics, 5th Ed. McGraw Hill, Noida • Srilashmi B. (2019). Dietetics, 8th Ed., New Age International Publishers., New Delhi • Mudambi SR, Rajgopal MV. (2020). Fundamentals Of Foods, Nutrition And Diet Therapy, 6th Ed.,New Age International Publishers., New Delhi • Agarwal A, Udipi SA. (2013). Textbook Of Human Nutrition., 1st Ed., Jaypee Brothers Medical Publishers, New Delhi • Srilakshmi B (2011) Dietetics, 6th Ed., New Age International Publ., New Delhi • Mclaren DS, Meguid MM (1998) Nutrition and its disorders, Churchill Livingstone • Gopalan C (1993) Recent trends in nutrition, 9th Ed., Oxford Univ. Press • Ghosh (1992) The feeding and care of infants and young children, VHAI, 6th Ed., New Delhi • Swaminathan M (1985) Essentials of food and nutrition, Vol I and II, Ganesh and Co, Madras • WHO (1978) A growth chart for international use in maternal and child health care, Geneva

SEMESTER IV

MINOR ELECTIVE-1 DIETETICS COURSE

CODE: 4Y4FNTMN1

(Credits: Theory-04, Practicals-02)

Course objective:-

Course Outcomes (COs): After the successful completion of the course, the student will be able to: CO 1. Know the principles of diet therapy CO 2. Understand the modifications of normal diet for therapeutic purposes CO 3. Learn the role of a registered dietician CO 4. Identify the roles of others who collaborate in delivery of food and nutrition services	
Content of Theory	**45 Hrs**
Unit–1	15
Definition of dietetics, clinical dietetics, objectives of dietetics, Growth and scope of dietetics, Characteristics and role of dietician in health care, classification of dietitian, characteristics of a dietitian, objectives of diet therapy. Hospital Dietary services- role and functions. Routine hospital diets: Liquid diet, semi-solid, regular and bland diet. Modification of normaldiets. Types of feeding - oral feeding and tube feeding - enteral and parental	
Unit -2	15
Diets in obesity and underweight: Obesity - Etiology, assessment, types. Regional distribution of fat in the body. Metabolic changes in obesity. Modification, dietary treatment. Nutritional requirements. Die management – objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Under weight - Aetiology, Symptoms and complications, Dietary management - objectives macronutrients, micronutrients, general considerations, foods allowed/not allowed	
Unit -3	15
Diet in infections and febrile conditions: Fever: Development, types and metabolic changes. Acute and chronic fevers. Causes and dietary management of typhoid, influenza, malaria, tuberculosis. Dietary management of all fevers - objectives, macronutrients, micronutrients, general considerations, foods allowed/ not allowed. Chronic infection- HIV (Human Immunodeficiency Virus) infection and AIDS (Acquired Immune Deficiency Syndrome). Stages of HIV infection. Aetiology, diagnosis. Malnutrition and AIDS: Dietary management -objectives, macronutrients, micronutrients, general considerations.	

Course Title	**Dietetics - I (Practical)**	Practical Credits	**2**

Content of Practical

Planning, preparing and calculating the following diets (Two case studies)

1. Fluid diets
   a. Clear fluid
   b. Full fluid
   c. Tube feeding
2. Obesity
   a. Childhood obesity/overweight
   b. Adulthood obesity/overweight
3. Underweight.
   a. Childhood
   b. Adulthood
4. Febrile conditions
   a. General fevers
   b. Typhoid
   c. Tuberculosis

References book

- Srilakshmi B (2011) Dietetics, 6th Ed., New Age International Publ., New Delhi
- Joshi SA, (1992) Nutrition and dietetics, Tata McGraw Hill Publications, New Delhi
- Raheen Begum (1989) A textbook of foods, nutrition and dietetics, Sterling Publ., Delhi
- Anderson L, Dibble MV, Turkki PR, Mitchall HS, Rynbergin HJ (1982) Nutrition in health and disease, 17th Ed., JB Lippincott and Co., Philadelphia
- Antia FP (1973) Clinical dietetics and nutrition, 2nd Ed, Oxford Univ. Press, Delhi Williams SR (1989) Nutrition and diet therapy, 6th Ed, Time, Mirror, Mosby College Publ.

SEMESTER IV

INTRODUCTION TO STOCK MARKET – VS-1

Subject Code: 4Y4VS-1

(Credits: Theory-01 + Practical 02)

Course Content:

Unit I: Financial System And Services:

Nature and role of financial structure - Financial system and financial markets - Financial system and economic development -Indian financial system: an overview; Investment alternatives and evaluation; Reforms in financial system, Investment banking; Credit Rating; factoring and Forfaiting; Housing Finance; Leasing and hire purchase; Financial inclusion and Microfinance

Unit II: Financial Markets:

Money market- meaning, constituents & function; Money market instruments – call money, treasury bills, and certificate of deposits, Commercial bills, and trade bills, AcceptanceHouses, Discount Houses; Capital markets – primary and secondary market; Government securities markets; Role of SEBI - an overview and recent developments. Role of RBI, SEBI. DFHI, SHCI in Financial Markets.

Unit III: Financial Institutions:

Reserve bank of India – organization, management, and function; Commercial banks - meaning, functions and investment policies; Development banks – concept, objectives, and function; Insurance companies – objectives, role, and investment practices, -IRDS; Unit Trust of India – objective, function, and schemes; role and functions of nonbanking financial institutions; Merchant banking-functions and role.

Unit IV: Financial Instruments

Sources of finance – Financial Instruments – Types, Features and advantages – Equity and special types of equity, ADRs & GDRs; Preferred stock - Equity derivatives – Credit derivatives-Asset –backed securities - Convertibles and warrants - Types of Bonds and debentures- Non- Marketable Financial Assets - Options instruments – securitization.

Unit V: Mutual Funds:

Concept and performance of Mutual funds; Regulation of Mutual funds (with special reference to SEBI guidelines); Designing and marketing of mutual fund schemes; Latest mutual funds schemes in India – an overview; Mutual Fund Evaluation and Tax aspects of Mutual Fund Investments.

Unit VI: Capital Markets in India

An overview of Indian Securities Market, Meaning, Functions, Intermediaries, Role of Primary Market – Methods of floatation of capital – Problems of New Issues Market – IPO's-Investor protection in primary market – Recent trends in primary market – SEBI measuresfor primary market.

Unit VII: Stock exchanges and its Functions:
Meaning, Nature, Functions of Secondary Market – Organization and Regulatory framework for stock exchanges in India – SEBI: functions and measures for secondary market – Overview of major stock exchanges in India - Listing of Securities: Meaning – Merits and Demerits – Listing requirements, procedure, fee – Listing of rights issue, bonus issue, further issue – Listing conditions of BSE and NSE – Delisting

Unit VIII: Trading, settlement and Surveillance
System in Stock Exchanges: Different trading systems – BSE - BOLT System – Different types of settlements - Pay-in and Pay-out – Bad Delivery – Short delivery – Auction – NSE – NEAT system options – Market types, Order types and books – De-mat settlement – Physical settlement – Institutional segment – Funds settlement – Valuation debit – Valuation price – Bad and short delivery Risk management system in BSE & NSE – Margins – Exposure limits – Surveillance system in BSE & NSE – Circuit breakers

Unit IX: Stock Market Indices:
Meaning, Purpose, and Construction in developing index – Methods (Weighted Aggregate Value method, Weighted Average of Price Relatives method, Free-Float method) – Stock market indices in India – BSE Sensex - Scrip selection criteria – Other BSE indices (briefly) – NSE indices – S&P CNX Nifty – Scrip selection criteria – Construction – Stock market indices in foreign countries (Overview).

Unit X: Commodity and Currency Markets:
Commodity exchanges: evolution and history- role in globalizing economy – governing regulations – price –risk management – commodity exposure – hedge accounting – currency futures – managing exchange rate – carbon markets – weather derivatives – ETFs – Purpose, Importance, types, construction

PRACTICALS: **60 Lectures**

1. Visit to a local market to study various marketing functions performed by different agencies (market functionaries).
2. Identification of marketing channels for selected mutual fund.
3. Identification of marketing channels for selected Equity.
4. Identification of marketing channels for selected commodity.
5. Computation of marketable and marketed surplus of important commodities.
6. Construction of index numbers.
7. Collection of data regarding marketing cost and marketing margins of different commodities and presentation of report in the class.
8. Visit to market institutions – NAFED, SWC, CWC, cooperative marketing society, etc. to study their organization and functioning.
9. Application of principles of comparative advantage of international trade
10. Plotting and study of demand and supply curves and calculation of elasticity's.
11. Study of relationship between market arrivals and prices of some selected commodities.
12. Study of price behaviour over time for some selected commodities.